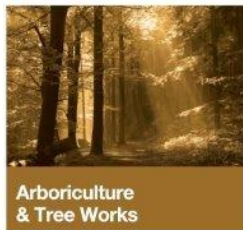


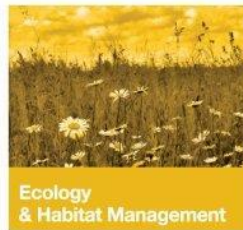
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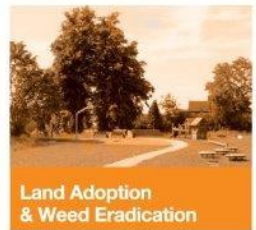
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Arboriculture
& Tree Works



Ecology
& Habitat Management



Land Adoption
& Weed Eradication

James Blake Associates Ltd

Phase 1 Habitat Survey

Of

Land at Long Lawford (Phase 4), Warwickshire

On behalf of

Bloor Homes South Midlands

November 2017

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Over 25 Years of Service, Value and Innovation

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Revision	Purpose	Originated	Checked	Authorised	Date
		IS	CA	KS	June 2017
A	Change to site designation	SR	/	JBA	November 2017
Job Number: JBA 17/099		<div>James Blake Associates</div> Title: Phase 1 Habitat Survey of Land at Long Lawford Phase 4			

Disclaimer

James Blake Associates Ltd have made every effort to meet the client's brief. However, no survey ensures complete and absolute assessment of the changeable natural environment. The findings in this report were based on evidence from thorough survey: It is important to remember that evidence can be limited, hard to detect or concealed by site use and disturbance. When it is stated that no evidence was found or was evident at that point in time, it does not mean that species are not present or could not be present at a later date: The survey was required because habitats are suitable for a given protected species, and such species could colonise areas following completion of the survey.

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Non-technical Summary

Site:	Long Lawford Phase 4, Rugby, Warwickshire
Grid Reference (from the centre of the site)	SP 473 756
Report Commissioned by:	Bloor Homes South Midlands
Date of Survey:	18 th April 2017

Considerations	Description	Timings and potential impacts
Statutory and non-statutory sites within 2km:	18 local wildlife sites and potential local wildlife sites	No impacts to any statutory or non-statutory sites are predicted
SPA, SAC and Ramsar sites within 7km:	There are no SPAs, SACs or Ramsar sites within 7km of the site	N/A
Phase 2 surveys:	Reptile surveys	April to September
	Bat surveys	Emergence/return to roost: May to August. Climb and Inspect: year-round
	eDNA great crested new surveys	Mid-March to end of June
Phase 2 survey which may be needed (dependent on final layout):	Great crested newt surveys (if eDNA surveys are positive)	Mid-March to mid-June, with at least half carried out during mid-April to mid-May
Precautionary Measures:	Removal of scrub and hedgerows	Outside of the nesting bird season (March to September) or following a nesting bird survey
	Removal of trees with bat roost potential	Following confirmation of roosting sites after tree inspection
	Nesting bird survey prior to scrub removal	During main breeding bird season (March to September)
Habitat types:	Improved and semi-grassland, scrub, hedgerows, ruderal vegetation and a pond	

1 Introduction

Background

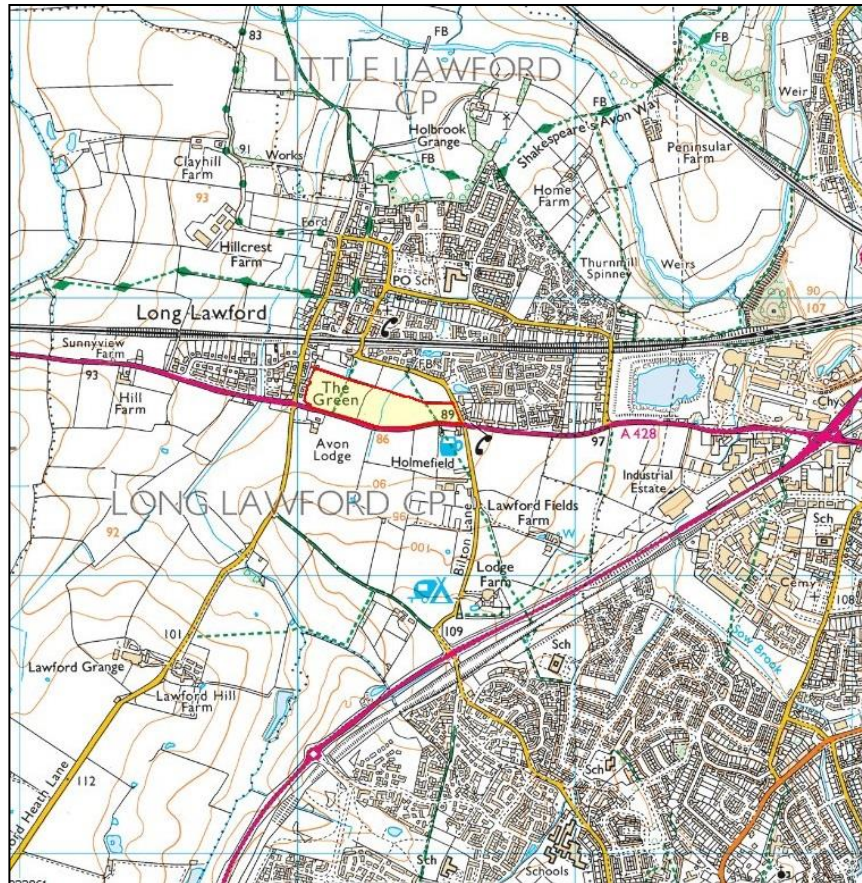
- 1.1 James Blake Associates Ltd were commissioned by Bloor Homes South Midlands to undertake a Phase 1 Habitat Survey and Protected Species Scoping Survey of land at Long Lawford Phase 4, Rugby, Warwickshire (grid ref SP 473 756, taken from the centre of the site).
- 1.2 The assessment was required to accompany a planning application to develop the site: Residential housing with associated infrastructure is proposed.
- 1.3 For the purposes of this report, protected species are taken to be those which are protected under European Legislation (Conservation of Habitats and Species Regulations 2010, as amended) and UK legislation (Wildlife and Countryside Act 1981; Protection of Badgers Act 1992); and species and habitats of principle importance which are listed in Section 41 of the NERC Act (2006).
- 1.4 There is a general biodiversity duty in the National Planning Policy Framework (NPPF) 2012, placing responsibility on Local Planning Authorities to aim to conserve, enhance and encourage biodiversity in and around developments. Section 40 of the NERC Act requires every public body in the exercising of its functions to 'have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'. Biodiversity, as covered by the Section 40 duty, includes all biodiversity, not just the habitats and species of principal importance. However, there is an expectation that public bodies would refer to the S41 list when complying with the Section 40 duty.

Site Description

- 1.5 The site was located to the north of Coventry Road in the village of Long Lawford near Rugby, Warwickshire. Residential housing bordered the northern, eastern and western boundaries. The large town of Rugby was approximately 1.5km to the east. A cement works with two large ponds is approximately 1.3km east. The River Avon ran east to west to the north of Long Lawford. The remaining wider landscape was predominantly arable fields interspersed with fragmented woodland and villages (see Figure 1).
- 1.6 The site itself was a grazing field of improved grassland. Mixed hedgerows with mature trees lined the site boundary, with two hedgerows and associated dry ditches

dividing the site. There was a small seasonal pond (approximately 230m²) in the south of the site. The northern boundary lay along a construction site for residential housing development. Back Lane and the A428 lay along the eastern and southern boundary respectively. Gardens from residential houses backed onto the western boundary.

Figure 1: Site location



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Aims and objectives

1.7 The aim of the survey was to:

- Identify the presence, or potential presence, of any protected or notable species or habitats on, or adjacent to, the site;
- assess the potential impact of the proposed works on any protected or notable species and/or habitats present including nature conservation sites on, or adjacent to, the site;
- make recommendations for further surveys and/or mitigation following the survey (if necessary) and provide suggestions to enhance the wildlife value of the site post-development.

2 Methods

Desk study

- 2.1 A 2km radius search for statutory designated sites, excluding Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites, either on the proposed development site or in the surrounding area, was conducted using “MAGIC”, the Multi-Agency Geographic Information system for the Countryside.
- 2.2 A 7km search for SACs, SPAs and Ramsar sites was also conducted using MAGIC.
- 2.3 The Warwickshire Biological Records Centre was consulted for records of non-statutory sites and protected and rare species within a 2km search radius (WBRC data provided on the 6th April 2017).
- 2.4 The site is covered by the Local Biodiversity Action Plan (LBAP) for Warwickshire, Coventry and Solihull (www.warwickshirewildlifetrust.org.uk/LBAP).

Phase 1 Habitat Survey

- 2.5 The survey was undertaken by Crystal Acquaviva BSc (Hons) MSc MCIEEM (Natural England bat class licence WML-CL19 & WML-CL20 and great crested newt class licence WML-CL08) and Isaac Stirling BSc (Hons) on the 18th April 2017. During the survey, the temperature was 15°C; there was light air (Beaufort scale 1), 40% cloud cover and good visibility.
- 2.6 The survey methodology followed JNCC (Joint Nature Conservation Committee) Guidelines (JNCC, 2010) and included mapping habitat types and identifying all plant

species observed on the site, including Wildlife and Countryside Act Schedule 9 invasive plant species such as Japanese knotweed (*Fallopia japonica*) and giant hogweed (*Heracleum mantegazzianum*).

- 2.7 The site was also assessed for signs and evidence of protected, principally important and rare species in accordance with approved guidelines, as follows:
- 2.8 **Amphibians:** Where accessible, known ponds within 500m of the site (unless ecologically separated from the site by significant barriers, such as major roads or rivers) were assessed for potential to support breeding protected amphibians, such as great crested newts.
- 2.9 **Bats:** Mature trees within the site boundary, and adjacent to the site boundary, were surveyed externally, from the ground, for their potential to support roosting bats, under the following criteria, taken from recommendations made by the Bat Conservation Trust in the 'Bat Surveys for Professional Ecologists Good Practice Guidelines' (BCT, 2016).

Table 1: Bat survey protocol for trees (potential bat roosting features were identified in order to categorise trees, as below):

Bat Roost Potential	Field signs
Roost Confirmed	Confirmed bat roost in tree: field evidence of the past or current presence of bats, e.g. droppings, staining.
High roost potential	Splits or cracks in major limbs which develop upwards, smooth surface or flies around entry point, medium to dense ivy-covering particularly on mature trees, woodpecker/rot holes, hollow stem or limb, significant lifting bark, snagged branches, artificial bird or bat boxes, tightly forked branch unions, hole between roots leading into a hollow stem, dense epicormic growth, deadwood in canopy or stem, Ancient or over mature trees where the canopy cannot be fully inspected from the ground.
Medium roost potential	Splits in branches, low - medium ivy-covering on trees in healthy condition, small cavities and small areas of deadwood in canopy or stem.
Low roost potential	Splits in minor branches, sparse ivy, and limited loose bark.
No roost potential	Trees with good visibility to the top of the canopy (particularly young and semi-mature trees) not supporting any of the above features or trees with a negligible potential to support bat roosts (may display minor features but considered highly unlikely to be suitable for bats).

- 2.10 **Dormice:** A visual survey for the presence of suitable habitat (woodland/suitable hedges with good under-storey/shrub layer and a range of food plant species, such as hazel, bramble and honeysuckle) was carried out, to assess if dormice were likely to be present.
- 2.11 **Reptiles:** A visual survey for the presence of suitable habitat was carried out according to the criteria given in the Herpetofauna Workers' Manual (Gent and Gibson 1998).
- 2.12 **Invertebrates:** The site was scoped for significant rotting deadwood, and high quality aquatic or other habitats, which could be used by significant assemblages of invertebrates, or by any of the invertebrates highlighted in the data search.
- 2.13 **Flora and habitats:** All habitats and plant species that were identifiable at the time of the survey were recorded.
- 2.14 **Badgers:** A visual survey for setts, hair, latrines, prints, snuffle marks or other signs of badgers was undertaken within the site boundary, following guidelines set out by the Mammal Society (1989).
- 2.15 **Birds:** A visual survey of bird activity and suitable nesting habitat was carried out, to determine if any areas would be suitable for WCA Schedule 1 birds, Birds of Conservation Concern or other common and widespread nesting birds.
- 2.16 **Adjacent Habitat:** Habitats close to the site were identified, using aerial maps and field observation, so that the ecological impact of the proposed works on the wider landscape could be assessed.

3 Results

Desk Study

Statutory Nature Conservation Sites within 2km of the site and Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites within 7km

3.1 There were no statutory sites within 2km of sites.

3.2 There were no SACs, SPAs or Ramsar sites within 7km of the site.

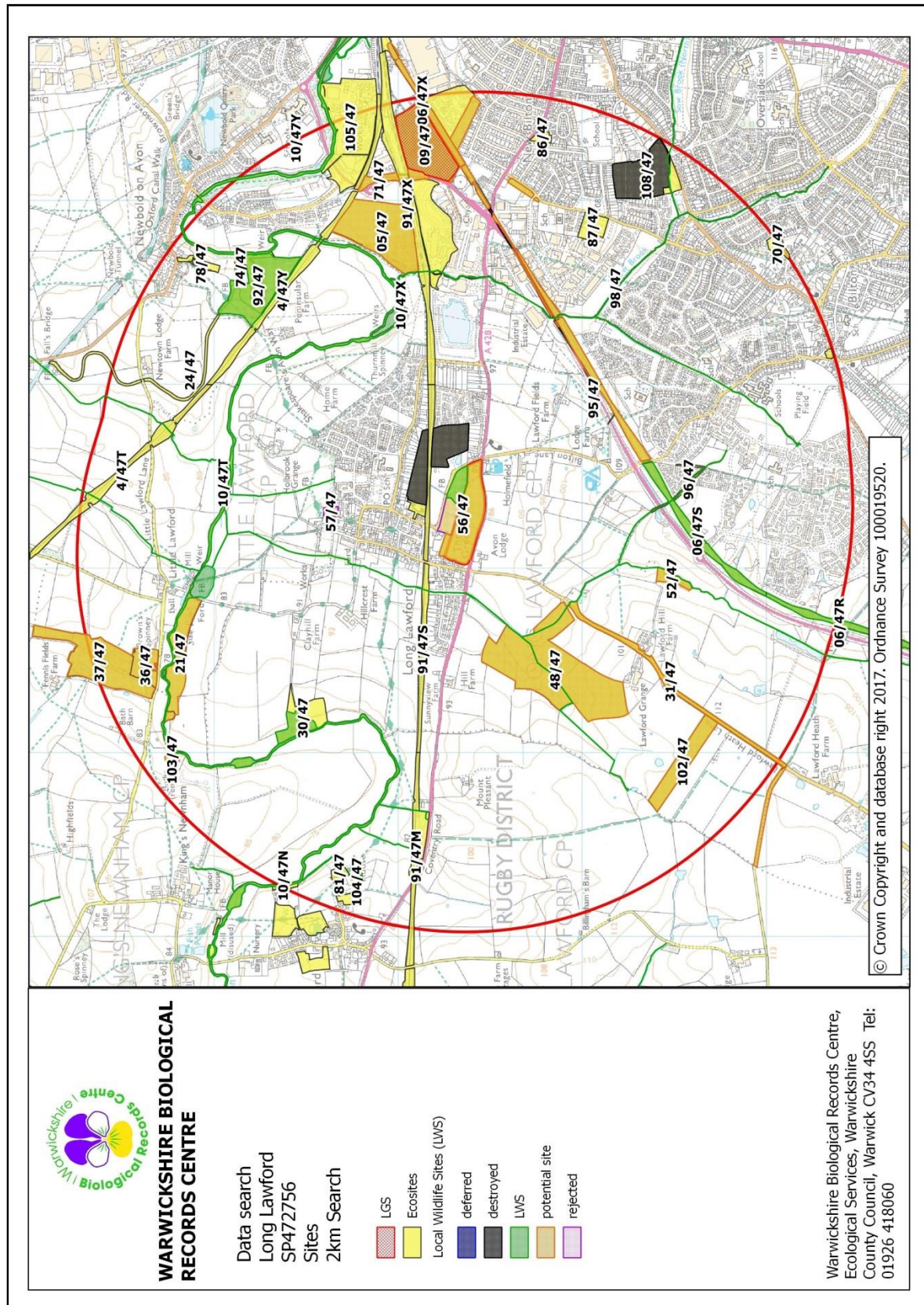
Non-Statutory Nature Conservation Sites

3.3 The site itself was considered to be a potential Local Wildlife Site in 2016 but has since been considered to have no designation to the site. There were 19 non-statutory conservation sites within 2km of the site: seven of which were local wildlife sites (LWS); all other sites were potential local wildlife sites (pLWS). These are listed in Table 2 and shown in Figure 2.

Table 2: Non-statutory conservation sites within 2km of the site

Site Name	Designation	Distance from Site	Description
Victoria Quarry Rugby Portland Cement Co., Rugby (05/47)	pLWS	1.3km east	Semi-improved neutral and calcareous grasslands, dense and scattered scrub, semi-natural broadleaved woodland and swamp. The site is of high importance to butterflies. Orchid species including bee orchid (<i>Ophrys apifera</i>) and common spotted orchid (<i>Dactylorhiza fuschii</i>). Only the northern part of the site (Malpass Quarry) is considered as a pLWS.
Dismantled Railway, Rugby to Leamington (06/47)	LWS	1km south	Short ephemeral vegetation and regenerating woodland. Several orchid species, including bee orchid (<i>Ophrys apifera</i>) and common spotted orchid (<i>Dactylorhiza fuschii</i>), have been recorded on site.
Parkfield Road Quarry and Slagheap, Rugby (09/47)	pLWS	1.5km east	A variety of habitats, including bare ground, cliff face, tall herb, scrub, open water and swamp. Several orchid species, including bee orchid (<i>Ophrys apifera</i>), common spotted orchid (<i>Dactylorhiza fuschii</i>) and marsh orchid (<i>Dactylorhiza praetermissa</i>), have been recorded on site.
River Avon (10/47)	LWS	1.2km east, 1.5km north, 1km north west	River and adjacent bankside habitats. Typical lowland river habitat including islands and stable earth cliffs. Water vole (<i>Arvicola terrestris</i>) and otter (<i>Lutra lutra</i>) have been recorded in sections of the river.

Field off Lawford Heath Lane, Lawford Heath (102/47)	pLWS	1.8km south west	An arable field previously recorded as poor semi-improved pasture.
King's Newnham Quarry, King's Newnham (103/47)	pLWS	1.9km north west	Quarry with semi-improved grassland growing along its banks.
Church Lawford meadow, Church Lawford (104/47)	pLWS	1.9km west	Horse grazed field with semi-improved grassland, as well as a recently constructed pond.
Field, Little Lawford (21/47)	pLWS	1.7km north west	Improved grassland field.
Lime Kilns, River Avon (30/47)	LWS	1.1km north west	Water filled pits with associated water and marginal vegetation, and adjacent marshy grassland.
Lawford Heath Lane hedge, Lawford Grange (31/47)	pLWS	600m south west	Double hedge running alongside semi-improved roadside verge with trees and scrub. The hedge provides good cover for birds.
Brown's Spinney, Little Lawford (36/47)	pLWS	1.8km north west	Well drained, unmanaged deciduous canopy with open canopy. There are also two ponds, one of which is used for fishing.
Fennis Fields, Little Lawford (37/47)	pLWS	1.9km north west	Semi improved pasture and two pools. One of the pools is surrounded with marginal vegetation and trees.
Field near Mount Pleasant, Long Lawford (48/47)	pLWS	600m south west	Poor semi-improved pasture with River Avon running through the site.
Irrigation pool, Lawford Grange (52/47)	pLWS	1km south	Pool and disused irrigation reservoir used for fishing. There are large areas of open mud used by waders particularly during the spring and autumn migration.
Long Lawford Meadows, Long Lawford (57/47)	LWS	Adjacent to north east boundary of site	Neutral grassland and secondary woodland within damp meadows and species-rich hedgerows, as well as a muddy pond
Parkfield Road Verge, Rugby (71/47)	pLWS	1.8km east	Roadside verge with diverse grassland flora. Both verge sides are heavily scrubbed.
Newbold Road Spinney, Newbold on Avon (74/47)	LWS	1.8km north east	Small diverse spinney consisting of several species through a range of maturities. The woodland supports a large glow worm population.
Newbold Old Lime Works (Newbold Tip), Newbold on Avon (92/47)	LWS	1.6km north east	Former lime works with extensive areas of tall ruderal vegetation, with areas of semi-improved grassland and semi-natural broad-leaved woodland. A large population of glow worms and bee orchids (<i>Ophrys apifera</i>) have been recorded here.
Sow Brook, Rugby (98/47)	LWS	1km south east	Part natural and part culverted stream with features including earth cliffs, gravel bars, riffles and pools. Bank vegetation is tall grass and herb with scattered trees.

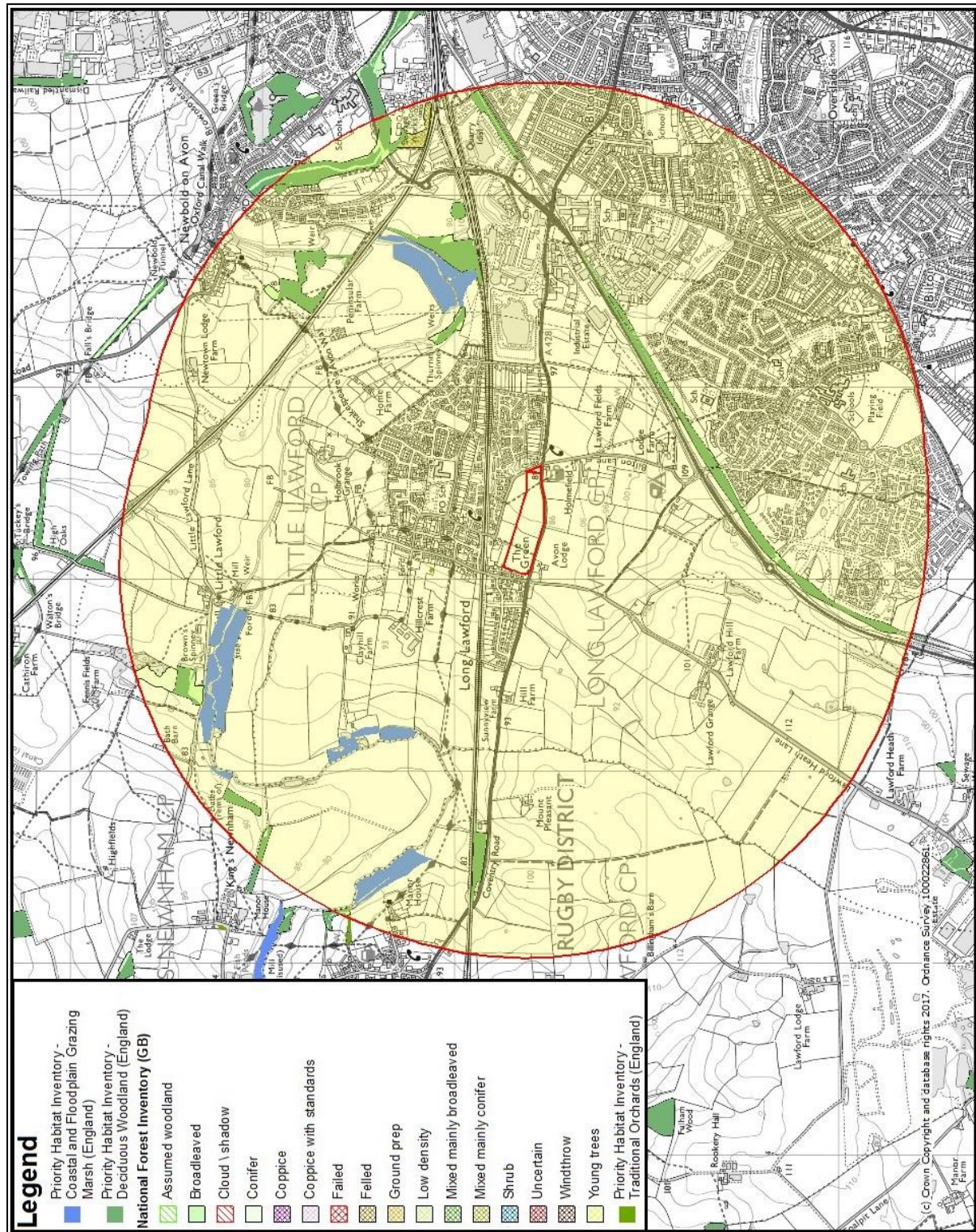
Figure 2: Non-statutory sites within 2km

Habitat Types within 2km

3.4 Habitat types within the local area are listed in Table 3 and shown in Figure 3.

Table 3: Habitat types within 2km of the site.

Habitat type	Closest approximate distance from Site
Floodplain grazing marsh	1km east
Broadleaved woodland	2km north east
Deciduous woodland	1km south
Traditional orchard	500m north

Figure 3: Habitat types within 2km

Protected, priority and rare species

- 3.5 The Birds of Conservation Concern (BoCC) are split into three criteria. The red list is the highest conservation priority (species needing urgent action). The amber list is the next most critical group, followed by green. Red listed species are those that are globally threatened according to IUCN criteria, species with populations or ranges that have declined rapidly in recent years, and those that have declined historically and have not shown a substantial recent recovery.
- 3.6 Full lists of UK principally important and protected amphibians, reptiles and mammals are shown below. A reduced list of UK principally important and protected birds, plants and invertebrates is shown; these have been selected based on their likelihood of being recorded at the site given the habitats types present.

Birds	Protection	Approximate distance from site	Year of Record
Barn owl	WCA Sch 1; LBAP	900m west	2007
Dunnock	BoCC amber listed; SPI	on site	2012
Kestrel	BoCC amber listed; LBAP	1.7km west	2014
Linnet	BoCC red listed; SPI	1.6km south east	2008
Skylark	BoCC red listed; LBAP; SPI	1.4km south	2005
Starling	BoCC red listed; SPI	1.6km south east	2008

Mammals	Protection	Approximate distance from site	Year of Record
Brown long-eared bat	WCA Sch5; LBAP; SPI;	650m north	2014
		2km south west	2015
Common pipistrelle (sl)	WCA Sch5; LBAP; SPI;	on site	2012
		2km south east	2014
Noctule bat	WCA Sch5; LBAP; SPI;	1.7km south west	2011
		2km south east	2014
Soprano pipistrelle	WCA Sch5; LBAP; SPI;	700m north	1996
		1.8km south west	2011
Otter	European protected; WCA Sch 5; LBAP; SPI	1.4km north west	2015
Hedgehog	WCA Sch5; LBAP; SPI	on site	2013
Brown hare	SPI	1.8km north west	2016

Invertebrates	Protection	Approximate distance from site	Year of Record
Dingy skipper	Red List <i>Vulnerable</i> ; LBAP; SPI	1.1km east	2012
Grizzled skipper	Red List <i>Vulnerable</i> ; SPI	600m north east	2009
		1km north east	2013
Small blue	Red List <i>Near Threatened</i> ; LBAP; SPI	1.2km east	2012
Small heath	Red List <i>Near Threatened</i> ; SPI	400m north west	1998
		1km north east	2013
Wall	Red List <i>Near Threatened</i> ; SPI	800m north east	1996
		1.4km east	1999
White-clawed crayfish	European protected; WCA Sch5; LBAP; SPI	1.7km east	2000
An additional 55 species of moths were recorded within 2km of the site, 53 of which were SPIs.			

Plants	Protection	Approximate distance from site	Year of Record
Dwarf spurge	IUCN Red Data List: vulnerable; LBAP	1.8km south	2010
Flat-stalked pondweed	IUCN Red Data List: vulnerable	2.1km north east	Unknown
Sainfoin	IUCN Red Data List: vulnerable	1.8km east	2014

Amphibians	Protection	Approximate distance from site	Year of Record
Common toad	SPI	1.4km south west	2007
Great crested newt	European protected; LBAP; SPI	1.9km south west	2011
		1.9km south	2014

Reptiles	Protection	Approximate distance from site	Year of Record
Common lizard	SPI	400m north	2010
Grass snake	SPI	650m north	2007
		1.3km north east	2011

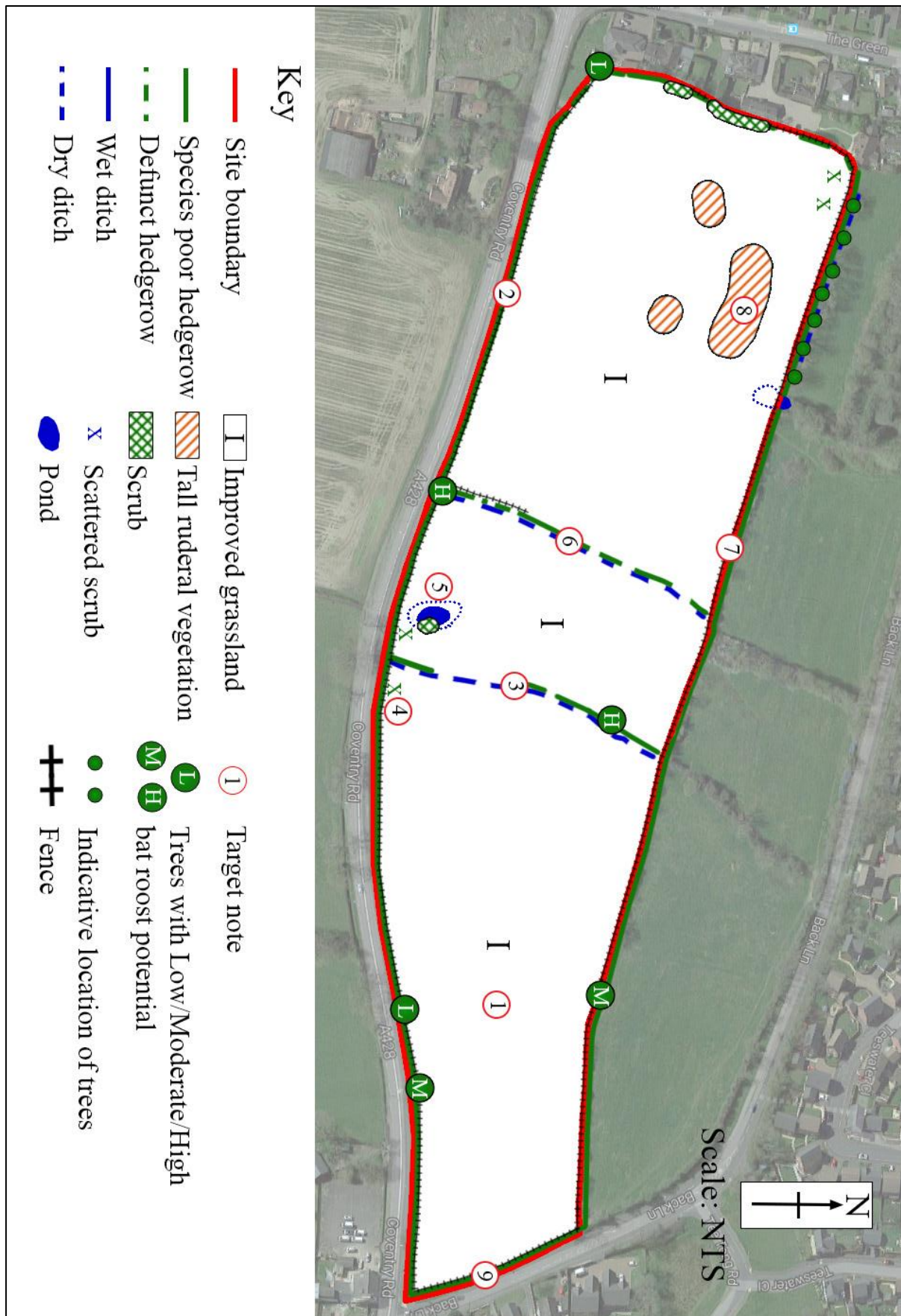
WCA = Wildlife and Countryside Act 1981 as amended; SPI = Species of Principle Importance;
 LBAP = Local Biodiversity Action Plan; BoCC = Birds of Conservation Concern 4

Phase 1 Habitat Survey



- 3.7 Figure 4 shows a Phase 1 habitat map of the site, with Target Notes. A list of plant species identified on the site is included in Appendix A.




Limitations and Assumptions





- 3.8 The baseline conditions reported and assessed in this document represent those identified at the time of the survey on the 18th April 2017. Although a reasonable assessment of habitats present can be made during a single walkover survey, seasonal variations are not observed. The full plant species list (Appendix A) was based on the current site visit. The survey was conducted in April, which is in the optimal season for Phase 1 habitat surveys. All areas of the site were accessible on the day of the survey.
- 3.9 The desk study used available records and historical data from the local area. However, this does not provide a reliable indication of species present since records depend entirely on survey effort in the area, which is highly variable. The data are useful as a general guide to supplement the site visit, but absence of records does not reflect absence of species.


Figure 4: Phase 1 Habitat Map

Target Notes

Target Note	Habitat description	Photo
1	<p>The large field making up the majority of the site consisted of improved grassland for cattle grazing. Sward height was an average of 20cm. It was dominated by grass species with infrequent forbs.</p> <p>Grasses included annual meadow grass (<i>Poa annua</i>) and meadow foxtail (<i>Alopecurus pratensis</i>).</p> <p>Forbs included bulbous buttercup (<i>Ranunculus bulbosus</i>), clover, (<i>Trifolium spp.</i>), common ragwort (<i>Jacobaea vulgaris</i>), and speedwell (<i>Veronica spp.</i>).</p>	
2	<p>A continuous hedgerow surrounded the site, with gaps only at the western end of site.</p> <p>The hedgerow along the southern boundary was managed and maintained at a height of 1.5 – 2m, with an average width of 1.5m. Tall ruderals grew at the base and slightly away from the hedge. There were a small number of semi-mature trees within the hedgerow.</p> <p>Hedgerow species were dominated by hawthorn (<i>Crataegus monogyna</i>) and bramble (<i>Rubus spp.</i>), with ruderal species including nettle (<i>Urtica diocea</i>) and cleavers (<i>Galium aparine</i>).</p>	

3	<p>A dry ditch ran through the centre of the pasture, with fragmented remnant hedgerow growing above it. The hedgerow was approximately 3 to 4m tall and 2m wide. The ditch was approximately 0.5m deep and 2m wide, and had species from the surrounding improved grassland as well as tall ruderals growing in it and underneath the hedge.</p> <p>Species noted were the same as in Target Notes 1 and 2.</p>	
4	<p>There were small patches of scrub growing near to an old gate into the field at the southern boundary and along the eastern boundary.</p> <p>It was comprised of bramble (<i>Rubus spp.</i>) and snowberry (<i>Symphoricarpos albus</i>).</p>	
5	<p>A shallow pond (approximately 30cm deep) was found at the centre of the site near the southern boundary. It was found in a larger depression and so potentially has seasonally variable depth. The depression was approximately 6x12m at its widest and longest.</p> <p>Species were mostly the same as in Target Note 1, as well as water crowfoot (<i>Ranunculus aquatilis</i>). There was an adjacent area of scrub made mostly of hawthorn (<i>Crataegus monogyna</i>) and blackthorn (<i>Prunus spinosa</i>).</p>	

6	<p>There was another fragmented hedgerow running through the middle of the site. It was an approximate height of 5m tall, and 2-3m wide. A dry ditch ran along the bottom of the hedge, with a small wet area at the northern end. There were some semi-mature trees within the hedgerow with no bat roosting potential.</p> <p>The hedgerow was dominated by hawthorn (<i>Crataegus monogyna</i>) and bramble (<i>Rubus spp.</i>), but also included ash (<i>Fraxinus excelsior</i>), beech (<i>Fagus sylvatica</i>), blackthorn and oak (<i>Quercus robur</i>).</p>	 
7	<p>The western side of hedgerow along the northern boundary of the site differed slightly to the rest of the boundary hedge. It ran adjacent to the site boundary, appearing to be offsite, but had parts crossing onto site.</p> <p>Species found were more similar to those of Target Note 6.</p>	
8	<p>The western field had a large area of tall ruderal plants growing amongst the improved grassland.</p> <p>This end of the field had a higher concentration of meadow foxtail (<i>Alopecurus pratensis</i>) than grassland elsewhere on site. The areas of tall ruderals had species similar to those found under the hedgerow in Target Note 2.</p>	

9	<p>The eastern boundary of the site was a small stretch of hedgerow differing slightly from the rest. It was approximately 3m high and 1-1.5m wide.</p> <p>Species consisted of those in Target Note 1, but also contained field maple (<i>Acer campestre</i>).</p>	
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4 Protected Species – Results and Evaluation

Flora and habitats

- 4.1 **Semi-improved grassland-** The majority of the site was improved grassland on neutral soil. The field was used for cattle grazing and so was being left to grow, with some areas of short, and other more enriched areas with a tall sward.
- 4.2 **Hedgerows-** A line of hedgerow encompassed almost the whole of the site along its boundaries, and two smaller fragmented hedges passed through its centre. The hedgerows were species poor, with species primarily containing hawthorn and bramble with a range of herb species at the base. None of the hedgerows on the site were considered likely to be classified as 'important' under the Hedgerow Regulations 1997.
- 4.3 **Trees-** There were a number of semi-mature trees on the site within the hedgerows. Some of these, shown in Figure 4 (Phase 1 Habitat Map), were considered to have bat roost potential, including two mature oak trees with high roost potential.
- 4.4 The 2km desk study found records of LBAP, SPI and county notable species within the local area, but none were recorded at the site during the survey and would have been visible given the time of year. Due to the habitats within the site, it is unlikely that any of these species would be present on the site in significant numbers.
- 4.5 No further survey is necessary.

Bats

- 4.6 No buildings were situated on site. A number of semi-mature and mature trees within and at the site boundaries were considered to provide potential roosting opportunities for bats (including holes, fallen/snapped branches, aerial deadwood, split branches and ivy concealing potential roosting features), see Figure 3 for indicative locations of trees and BRP status.
- 4.7 The site provided moderate quality foraging habitat for bats with hedgerows also providing potential commuting routes. Hedgerow and pasture are abundant in the wider landscape.

- 4.8 Five bat species were recorded within 2km of the site boundary within the desk study, which included a brown long-eared bat maternity roost 700m to the north recorded in 2006 and a pipistrelle maternity roost 600m to the north recorded in 1999.
- 4.9 To minimise risk of disturbance to foraging and commuting bats on the site, activity surveys are advised and it is recommended that the development should follow lighting minimisation precautions, including the following:
- No works on site should be conducted after sunset and if security lighting is required then this should be kept to the minimal level (as necessary for safety and security)
 - Post development lighting should be directed away from boundary trees and vegetation, in particular, away from the larger trees indicated with roost potential.
 - Installation of lighting columns at the lowest practical height level with box shield fittings will minimise glare and light spillage
 - Lux level of lamps should be as low possible and be high pressure sodium (rather than metal halide, or other) with covers made from glass rather than plastic as this minimises the amount of UV light, reducing the attraction effects of lights on insects
 - Security lights should be set on short timers, and be sensitive to large moving objects only
- 4.10 If any trees on site with bat roost potential are to be impacted by the development, including surgery works or removal, further bat surveys, i.e. emergence/return to roost surveys, should be undertaken prior to works. Bat surveys can be undertaken between May and August. Climb and inspect surveys may be able to rule out the need for emergence surveys if features, once closely inspected, are found to be unsuitable for roosting bats. Climb and inspect surveys can be conducted year round.

Reptiles

- 4.11 The site provided moderate quality habitat for reptiles. The grassland provided potential foraging habitat and the hedgerows and scrub provided hibernation and shelter opportunities.
- 4.12 There are records of grass snake and common lizard within 2km of the site. Grass snakes were considered to be the most likely species to be present, given the structure of the vegetation.
- 4.13 It is recommended that reptile surveys are undertaken to assess the presence or likely absence of these species.
- 4.14 Reptile surveys can be undertaken between April and September, and involve seven visits to the site to survey previously laid artificial refuges. Surveys should follow current best practice guidelines (Froglife 1999).

Birds

- 4.15 Trees and hedgerows surrounding the site provided potential nesting and foraging opportunities for birds. The grassland was considered sub-optimal for ground nesting birds due to disturbance by grazing and the size of the field, however, the grassland was considered likely to be used by foraging birds.
- 4.16 Bird species observed during the field survey and their legal/conservation status are shown in the table below.

Table 4: Bird species observed during field survey

Bird species	BTO code	SPI	BoCC
Blackbird	B.		Green
Blue tit	BT		Green
Carrion crow	C.		Green
Chaffinch	CH		Green
Collared dove	CD		Green
Dunnoek	D.	✓	Amber
Goldfinch	GO		Green
House sparrow	HS	✓	Red
Jackdaw	JD		Green
Magpie	MG		Green
Meadow pipit	MP		Amber
Robin	R.		Green
Starling	SG	✓	Red
Woodpigeon	WP		Green
Wren	WR		Green

- 4.17 Habitats within the site such as pasture and scattered boundary trees are abundant locally. Therefore, it was considered unlikely that protected or rare birds would be significantly impacted by the proposed development. However, enhancement features such as nest boxes are recommended for house sparrows and starlings as these were present on the site (see Section 6).
- 4.18 Any trees/hedgerows proposed for retention should be suitably protected from harm during the construction works following British Standard: BS5837 (2012).
- 4.19 Site clearance and works proposed to any trees, scrub or hedgerows should be conducted outside the main bird breeding season (which is March until September). If vegetation removal is unavoidable between these dates, an ecologist should survey the site for active bird nests immediately prior to works. If nests are identified, there may be a delay in the clearance of some vegetation until all young birds have fledged.

Amphibians

- 4.20 There was a pond the south of the site (TN5), as well as one adjacent to the northern border and three more to the north of the site within 500m. The ponds were visited during the survey and were assessed for their suitability to support breeding great crested newts using the Habitat Suitability Index (HSI) assessment. Results from the HSI assessments are shown in Table 5, and a pond map and full HSI are shown in Appendix B.

Table 5: HSI results for ponds on and within 500m of site

	Description	HSI result
Pond 1	Seasonal pool within grassland on site	Below average
Pond 2	Pond in hedgerow bordering north of site	Poor
Pond 3	Dry soakaway pond for new housing development to north of site	None, Dry
Pond 4	Wet ditch on construction site (remnant pond) to north of site	Not assessed but appears unsuitable as breeding pond
Pond 5	Wet ditch (not flowing) to north of site	Below average

- 4.21 Habitats on the site were suitable for great crested newts with grassland providing foraging opportunities and hedgerows and scrub providing sheltering and hibernating opportunities. However, land in the adjacent field and surrounding area has recently been undergoing residential development and so many areas are now construction sites. This combined with a number of nearby busy roads would limit great crested newt movement to, or from, the site.
- 4.22 There are records of great crested newts 1.8km south west of site in 2011 and from 2km north east of site in 2010. However, both of these populations can be considered ecologically separated through distance and impassable features (roads and rivers). Pond surveys were conducted for development of land south of Back Lane (adjacent to the site on its northern border), and found no great crested newts.
- 4.23 It is recommended that eDNA surveys are carried out on all ponds on and within 500m of the site in order to reassess the presence of great crested newts. If these tests provide positive results, further surveys will be required to determine the population levels in the ponds. EDNA surveys can be undertaken between mid-March and the end of June.

Invertebrates

- 4.24 The field was not considered likely to support a large number of invertebrates due to the lack of plant diversity. However, the areas of tall ruderals, as well as the scrub and hedgerows, did provide potential habitat for common invertebrates. These habitats were of relatively limited extent and therefore unlikely to support a significant assemblage of protected or rare invertebrate species.
- 4.25 The data search highlighted records of dingy skipper and small blue butterfly within 2km of the site (both county LBAPs). The site contained suitable habitats for these species, but land in the surrounding area will also provide suitable habitat and so the local conservation status of invertebrates should not be significantly affected by the proposed development.
- 4.26 White-clawed crayfish was recorded 1.6km east of the site in 2000. However, there were no wet ditches connected to site and therefore this species would not be affected by the proposed development.
- 4.27 No further survey is necessary.

Badgers, hedgehogs and hares

- 4.28 The site and the surrounding hedgerows and gardens provided suitable habitat for foraging and commuting badgers, hares and hedgehogs. Hedgerows and adjacent scrub provided suitable cover for sett creation. Arable fields, hedgerows and small pockets of woodland in the wider landscape provided suitable foraging opportunities and additional cover for sett creation. However, no evidence for badger, hedgehogs or brown hare was recorded during the survey.
- 4.29 There are records of hedgehog and brown hare within the surrounding area 2km from the site from 2013 and 2016 respectively.
- 4.30 No further survey is considered necessary. However, it is recommended that areas of hedgerow vegetation at the boundaries of the site are retained or hedgerow planting included in designs to provide foraging and commuting routes for badgers, hedgehogs and brown hares.

Dormice

- 4.31 The site was sub-optimal for dormice. Hedgerows had infrequent mature trees, and lacked the variety of food plants necessary for dormouse nesting. Additionally, the site did not link to woodland in the wider area.
- 4.32 The desk study did not find any records of dormice within 2km of the site.
- 4.33 No further survey is necessary.

Other Protected, BAP or Rare Species

- 4.34 There were no water courses within the site or within 50m of the site boundary. It was considered unlikely that species such as otter and/or water vole would be impacted by the proposed development.

Potential Impacts to Conservation Sites

- 4.35 There were no European protected sites within 7km of the development area.
- 4.36 The table below shows SSSIs that were highlighted in the desk study as being within potential impact distance of the site.

Table 6: SSSI Impact Risk Zones which lay within the development site

SSSI Site	Distance	Public Accessibility
Coombe Pool	8.4km north west	There are public footpaths as well as a track suitable for vehicles running through the site.
Herald Way Marsh	8.9km west	A footpath borders the site's northern boundary.
Royston and Brandon Gravel Pits	8.4km west	A track suitable for vehicles passes through part of the site.
Brandon Marsh	7.7km west	This is a public nature reserve with several tracks running through it.
Wolston Gravel Pit	6km west	No public access.
Royston Wood	8.8km south west	There are several tracks suitable for walking and driving in this site.
Draycote Meadows	4.9km south	No public access.

Key Recommendations: Legal Requirements

- 5.1. Further surveys for great crested newts and bats are recommended. These species are protected under EU and UK law and loss of habitat or disturbance to these species should be adequately mitigated. Furthermore, a bat roost inspection should be carried out of trees with potential roosting status.
- 5.2. Further surveys for reptiles are also recommended, as these species are protected under UK law. It is an offence to intentionally and recklessly kill, injure, possess or sell reptiles.
- 5.3. Precautionary clearance of the site, hedgerows and trees will be necessary, as detailed in Section 4, to avoid infringing legislation which protects all nesting birds.

5 Additional and Enhancement Recommendations

- 5.1 The following are suggestions that will enhance the value of the site for wildlife. However, it should be noted that these suggestions are not legally required for compensation of habitats or mitigation, and may be revised depending on the outcome of the further surveys for reptiles, bats and great crested newts.
- 5.2 Where possible, hedgerows at the boundaries of the site should be retained and enhanced to create corridors and shelter/foraging areas for wildlife including birds and hedgehogs. Planting of native hedgerow species in gaps, for example along the gap in the hedge on the west of the site, will provide further opportunities for these species.
- 5.3 The addition of bat boxes on the proposed buildings or retained trees within the site would provide additional roosting opportunities. Schwegler bat boxes are recognised as being suitable for roosting bats and long lasting. Bat boxes should ideally be located south facing (between south east and south west) and above 5m. Boxes such as Schwegler 2F, 2FN and 1FF or integral bat tubes Schwegler 1FR are considered suitable for pipistrelles, brown long eared bats which have been identified within the local area and would be suitable for this site.
- 5.4 The addition of bird boxes for starlings (Schwegler 3S) and house sparrow terraces on the proposed buildings will provide additional nesting opportunities for these BoCC red listed species recorded on site. A variety of standard bird boxes (Schwegler 1B and 2H) fitted on buildings or retained trees will also attract a greater

diversity of birds to nest. Boxes should be located out of direct sunlight and close to, but not restricted by, vegetation.

- 5.5 Landscaping could incorporate native or wildlife attracting trees, shrubs, and wildflower areas as these would likely be of benefit to a variety of wildlife including, birds, bats and invertebrates.
- 5.6 The incorporation of reptile hibernacula into the landscape design will enhance the area for reptiles in the future. Hibernacula can be created by partially burying piles of wood/rubble and covering with earth.
- 5.7 'Hedgehog links' (i.e. 15cm diameter gaps at the base of fences) would allow small animals to move through the development.

6 Conclusion

- 7.1 The site was an improved grassland field with areas of tall ruderal vegetation growing in it. Hedgerows were present along its boundaries and two fragmented hedgerows ran north to south through its centre, both of which had associated dry ditches. There was also a seasonal pond in the grassland at the south of the site.
- 7.2 Further surveys are recommended to determine if reptiles are using the site. An eDNA survey of the onsite ponds and other ponds within 500m of the site should be carried out to determine if great crested newts are present, and if tests are positive a full great crested newt survey is also recommended. Bat surveys are also recommended to determine bat use of the site.
- 7.3 If any mitigation or compensation recommended following these further surveys is carried out, and if the precautionary measures for birds detailed in this report are followed, it was considered that the development could proceed with minimal impact on the local conservation status of any protected, principally important or rare species within the area.
- 7.4 It is also considered that with a sensitive landscape scheme, and by including some, or all, of the additional recommendations, the site could be enhanced for local wildlife post development.

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9 Appendices

Appendix A: Plant species list

Forbs

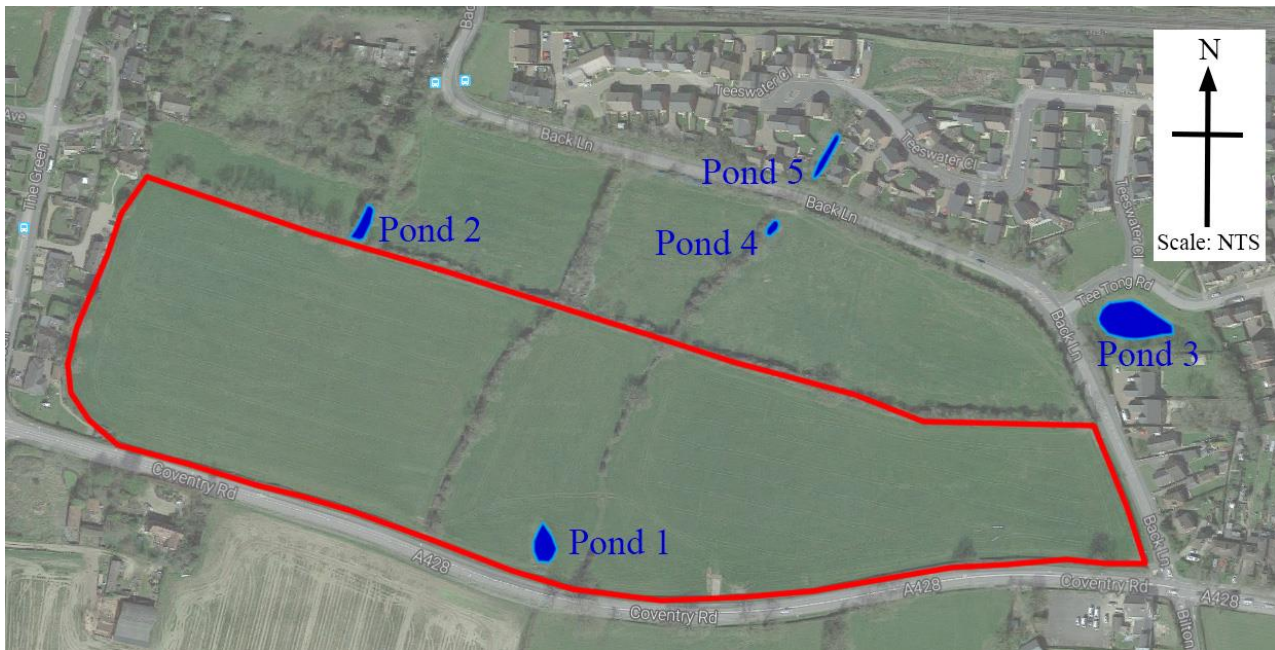
Common Name	Scientific Name	Grassland	Hedgerow
Yarrow	<i>Achillea millefolium</i>	✓	
Garlic mustard	<i>Alliaria petiolata</i>	✓	✓
Cow parsley	<i>Anthriscus sylvestris</i>	✓	✓
Daisy	<i>Bellis perennis</i>	✓	
Ladies smock	<i>Cardamine pratensis</i>	✓	
Greater celandine	<i>Chelidonium majus</i>	✓	
Creeping thistle	<i>Cirsium arvense</i>	✓	✓
Spear thistle	<i>Cirsium vulgare</i>	✓	
Wild carrot	<i>Daucus carota</i>	✓	
Lesser celandine	<i>Ficaria verna</i>	✓	
Cleavers	<i>Galium aparine</i>		✓
Cutleaf cranesbill	<i>Geranium dissectum</i>	✓	
Round leaved cranesbill	<i>Geranium rotundiflorum</i>	✓	
Ground ivy	<i>Glechoma hederacea</i>		✓
Hogweed	<i>Heracleum mantegazzianum</i>		✓
White dead nettle	<i>Lamium album</i>		✓
Red dead nettle	<i>Lamium purpureum</i>	✓	✓
Daffodil	<i>Narcissus spp.</i>		✓
Broadleaved plantain	<i>Plantago major</i>	✓	
Meadow buttercup	<i>Ranunculus acris</i>	✓	
Bulbous buttercup	<i>Ranunculus bulbosus</i>	✓	
Broad leaved dock	<i>Rumex obtusifolius</i>	✓	✓
Wood dock	<i>Rumex sanguineus</i>		✓
Common ragwort	<i>Senecio jacobaea</i>	✓	
Groundsel	<i>Senecio vulgaris</i>		✓
Chickweed	<i>Stellaria media</i>	✓	
Dandelion	<i>Taraxacum officinale agg.</i>	✓	
Clover spp.	<i>Trifolium spp.</i>	✓	
Nettle	<i>Urtica dioica</i>	✓	✓
Speedwell spp.	<i>Veronica spp.</i>	✓	

Trees and shrubs

Common Name	Scientific Name	Hedgerow	Scrub
Ash	<i>Fraxinus excelsior</i>	✓	
Beech	<i>Fagus sylvatica</i>	✓	
Blackthorn	<i>Prunus spinosa</i>	✓	✓
Bramble	<i>Rubus fruticosus</i> agg.	✓	
Elder	<i>Sambucus nigra</i>	✓	
Hawthorn	<i>Crataegus monogyna</i>	✓	
Ivy	<i>Hedera helix</i>	✓	
Field maple	<i>Acer campestre</i>	✓	
Oak spp.	<i>Quercus</i> spp.	✓	
Dog rose	<i>Rosa canina</i>	✓	
Willow spp.	<i>Salix</i> spp.	✓	
Box	<i>Buxus sempervirens</i>	✓	
Snowberry	<i>Symphoricarpos albus</i>	✓	✓

Grasses, sedges, rushes and ferns

Common Name	Scientific Name	Grassland	Hedgerow
Meadow foxtail	<i>Alopecurus pratensis</i>	✓	
Fennel	<i>Foeniculum vulgare</i>		✓
Soft rush	<i>Juncus effuses</i>	✓	
Annual meadow grass	<i>Poa annua</i>	✓	

Appendix B: Pond Map and Habitat Suitability Index (HSI)

	Pond 1		Pond 2		Pond 5	
Index	Field score	HSI value	Field score	HSI value	Field score	HSI value
Location	A	1	A	1	A	1
Pond Area (m ²)	144	0.29	50	0.10	40	0.08
Pond permanence	Frequent	0.10	Frequent	0.10	Never	0.90
Water Quality	Moderate	0.67	Poor	0.33	Poor	0.33
Shade (%)	80	0.60	75	0.70	99	0.22
Waterfowl	Absent	1.00	Absent	1.00	Absent	1.00
Fish	Possible	0.67	Absent	1.00	Absent	1.00
Pond density	7	1.00	7	1.00	7	1.00
Terrestrial Habitat	Moderate	0.67	Poor	0.33	Moderate	0.67
Macrophytes (%)	70	1	50	0.81	5	0.36
HSI Score	0.53		0.48		0.51	
Suitability	Below average		Poor		Below average	

Appendix C: Relevant protected species legislation

Species	Relevant Legislation	Level of Protection
Bats	<ul style="list-style-type: none"> Full protection under the Wildlife and Countryside Act (WCA) (1981) (Listed on Schedule 5) - as amended Classified as European protected species under Conservation of Habitats and Species Regulations 2010, as amended Also protected by the Wild Mammals (Protection) Act 1996 	<p>Under the WCA (1981), it is an offence to:</p> <ul style="list-style-type: none"> intentionally kill, injure, or take any species of bat intentionally or recklessly disturb bats intentionally or recklessly damage destroy or obstruct access to bat roosts
Birds	<ul style="list-style-type: none"> Protection under the Wildlife and Countryside Act (1981) as amended 	<p>Under the WCA (1981), it is an offence to: (with exceptions for certain species):</p> <ul style="list-style-type: none"> Intentionally kill, injure or take any wild bird Intentionally take, damage or destroy nests in use or being built (including ground nesting birds) Intentionally take, damage or destroy eggs <p>Species listed on Schedule 1 of the WCA or their dependant young are afforded additional protection from disturbance whilst nesting</p>
Great crested newts	<ul style="list-style-type: none"> Full protection under the Wildlife and Countryside Act (WCA) (1981) (Listed on Schedule 5) - as amended Classified as European protected species under Conservation of Habitats and Species Regulations 2010, as amended 	<p>Under the WCA (1981), it is an offence to:</p> <ul style="list-style-type: none"> intentionally kill, injure, or take great crested newts intentionally or recklessly disturb great crested newts intentionally or recklessly damage destroy or obstruct access to any place used by the animal for shelter or protection
Widespread reptiles	<ul style="list-style-type: none"> Partially protected under Schedule 5 of the Wildlife and Countryside Act (1981) as amended. 	<p>Under the WCA (1981), it is an offence to:</p> <ul style="list-style-type: none"> intentionally kill or injure these animals sell, offer for sale, advertise for sale, possess or transport for the purposes of selling any live or dead animals or part of these animals