

Land North of Eastway, Fulwood, Preston, PR2 3LL:
Local Centre

ECOLOGICAL SURVEY AND ASSESSMENT

January 2018

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ERAP (Consultant Ecologists) Ltd
49a Manor Lane
Penwortham
Preston
Lancashire
PR1 0TA

Tel: 01772 750502

mail@erap.co.uk
www.erap.co.uk



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Document Control

Survey Type:	Surveyors ¹	Survey Date(s)
Updated Phase 1 Habitat survey	Amy Sharples	27 th September 2017
Great crested newt surveys	Richard Lowe plus assistant	April to June 2010
Reptile surveys	Aidan and Marie Pickering	March to May 2014
Reporting	Personnel	Date
Author	Amy Sharples B.Sc. (Hons) M.Sc. GradCIEEM Ecologist	28 th September 2017
Signature(s)		
Checked by	Brian Robinson B.Sc. (Hons) MCIEEM Senior Ecologist	4 th October 2017
Revised and issued by	Amy Sharples B.Sc. (Hons) M.Sc. GradCIEEM	5 th October 2017
Report issued to	Hollins Strategic Land	
Copy Number	2 (updated 12 th January 2018)	
¹ Licence reference number		
Great crested newt		
• Richard Lowe Natural England Class Survey Licence Registration Number 2015-18691-CLS-CLS		

SUMMARY

Introduction and Scope

- i. This Ecological Appraisal presents the ecological, biodiversity and nature conservation status of the land north of Eastway, Fulwood, Preston hereafter terms the 'Local Centre'. The appraisal was requested in connection with proposals to develop the land to commercial and community use.
- ii. The appraisal presents the results of a desktop study and extended Phase 1 Habitat Surveys initially carried out in November 2013 and updated in March 2015 and September 2017. The scope of survey undertaken is appropriate to identify potential ecological constraints, the remit of mitigation required and opportunities for biodiversity associated with the development proposals.
- iii. The site comprises grazed species poor semi-improved grassland, tall-herb vegetation, Bramble scrub, trees and hedgerows.

Results of Survey and Assessment

- iv. The site contains two hedgerows, both of which are Priority Habitat; no other habitats within the site are Priority Habitat. . Neither hedgerow qualifies as 'important' under *The Hedgerows Regulations 1997*. The hedgerows, within the site are of local value as they provide structural diversity and are suitable for use by nesting birds. It is recommended that the development retains and protects the hedgerows and the majority of the trees and shrubs.
- v. Pond 1 lies adjacent to the site boundary. It is recommended that an undeveloped 10 metre buffer is retained at Pond 1 for the protection of amphibian species. Recommendations are presented at **Sections 5.2** and **5.5**.
- vi. Pond 1, adjacent to the site, is known to support breeding common toad, a Priority Species. A small population of slow-worm has been detected at the motorway verge adjacent to the northern site boundary. A comprehensive Reptile Survey and Mitigation Strategy, approved by the Local Planning Authority is appended at **Appendix A**.
- vii. The hedgerows, trees and shrubs are suitable for use by breeding birds. Recommendations for the protection and long-term conservation of opportunities for nesting and feeding birds at the site are described at **Section 5.4**.
- viii. No invasive species as listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended) were detected within the site boundary.
- ix. No other protected species have been detected within the site.

Recommendations

- x. The recommendations in **Section 5.0** address all the mandatory measures and ecological recommendations to be applied to ensure compliance with wildlife legislation, the National Planning Policy Framework (NPPF) and best practice.
- xi. The proposals will secure an opportunity to implement beneficial measures such as habitat management and habitat creation that will safeguard habitats for wildlife such as birds and bats, with the aim of providing a net gain in biodiversity in accordance with the principles of the NPPF.

Conclusion

- xii. It is concluded that the proposals are feasible and acceptable in accordance with ecological considerations and relevant planning policy. Development at the site will provide an opportunity to secure ecological enhancement for wildlife associated with development.

1.0 INTRODUCTION

1.1 Background and Rationale

- 1.1.1 ERAP (Consultant Ecologists) Ltd was commissioned by Hollins Strategic Land to carry out an updated ecological appraisal of the land north of Eastway, Fulwood, Preston, PR2 3LL: Local Centre (hereafter referred to as the 'site'). The Ordnance Survey (OS) grid reference at the centre of the site is SD 5247 3391.
- 1.1.2 The appraisal was requested in connection with a planning application to develop the site to commercial and community use.
- 1.1.3 An extended Phase 1 Habitat Survey was undertaken at the site in 2013 and the results are presented at *ERAP Ltd, Land North of Eastway, Fulwood, Preston, Ecological Survey and Assessment* (ERAP Ltd, 2013), hereafter referred to as the '2013 ecology report'.
- 1.1.4 The results of the updated ecological survey and assessment undertaken in 2015 are presented at *ERAP Ltd (November 2013 (updated March 2015)), Land North of Eastway, Fulwood, Preston: Fulwood Neighborhood Centre, Ecological Survey and Assessment* (ERAP Ltd, 2015), hereafter referred to as the '2015 ecology report.'

1.2 Scope of Works

- 1.2.1 The scope of the ecological surveys undertaken in 2010 and 2014 and updated in May 2015 and September 2017 comprised:
- A desktop study for known ecological information at the site and the local area;
 - An Extended Phase 1 Habitat Survey and assessment;
 - Assessment of the ecological value of the habitats within the site with the use of the National Vegetation Classification (NVC) and the Ratcliffe criteria, as presented in *A Nature Conservation Review* (Ratcliffe, 1977);
 - Survey and assessment of all habitats for statutorily protected species and other wildlife including badger (*Meles meles*), barn owl (*Tyto alba*), great crested newt (*Triturus cristatus*), water vole (*Arvicola amphibius*), bird species, invertebrates and reptiles;
 - Preliminary assessment of the trees within the site in terms of their suitability for use by roosting bats;
 - The identification of any potential ecological constraints on the proposals and the specification of the scope of mitigation and ecological enhancement required in accordance with wildlife legislation, planning policy guidance and other relevant guidance; and
 - The identification of any further surveys or precautionary actions that may be required prior to the commencement of any development activities.

2.0 METHOD OF SURVEY

2.1 Desktop Study

- 2.1.1 The following sources of information and ecological records were consulted:
- MAGiC: A web-based interactive map which brings together geographic information on key environmental schemes and designations, including details of statutory nature conservation sites;
 - Lancashire Environment Record Network (LERN); and
 - The Lancashire Biodiversity Action Plan (BAP).

2.2 Vegetation and Habitats

- 2.2.1 An Extended Phase 1 Habitat Survey of the site was carried out by Oliver Moore B.Sc. (Hons) GradCIEEM on 15th November 2013 and was updated by Amy Sharples B.Sc. (Hons) M.Sc. GradCIEEM on 5th March 2015.
- 2.2.2 An updated Extended Phase 1 Habitat Survey of the site was carried out by Amy Sharples B.Sc. (Hons) M.Sc. GradCIEEM on 27th September 2017. The weather was overcast with a gentle breeze (Beaufort Scale 3) and an air temperature of 16°C. The conditions and time of year were favourable for the ecological survey.
- 2.2.3 A habitat and vegetation map was produced for the site and the immediate surrounding area at a scale of 1:1750 (refer to **Figure 2**). The mapping is based on the Joint Nature Conservation Committee Phase 1 Habitat Survey methodology (JNCC, 2010) with minor adjustments to illustrate and examine the habitats with greater precision.
- 2.2.4 The plant species within the site boundary were determined with estimates of the distribution, ground cover, abundance and constancy of individual species. The estimation of abundance was based on the DAFOR system, where D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare, this being a widely used and accepted system employed by ecological surveyors. The terms L = Locally and V = Very were additionally used to describe the plant species distributions with greater precision.
- 2.2.5 Stands of vegetation and habitats were described and evaluated using the National Vegetation Classification (NVC). The NVC provides a systematic and comprehensive analysis of British vegetation and is a reliable framework for nature conservation and land-use planning.
- 2.2.6 Hedgerows were assessed in accordance with *The Hedgerows Regulations 1997* Wildlife and Landscape Criteria (H.M.S.O., 1997).
- 2.2.7 Searches were made for uncommon, rare and statutorily protected plant species, those species listed as protected in the *Wildlife and Countryside Act 1981* (as amended) and species which are indicators of important and uncommon plant communities. Plant nomenclature follows *New Flora of the British Isles 3rd Edition* (Stace, 2010).
- 2.2.8 Searches were carried out for the presence of invasive species, including those listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), including Japanese Knotweed (*Fallopia japonica*), Indian Balsam (*Impatiens glandulifera*) and Giant Hogweed (*Heraclium mantegazzianum*).

2.3 Animal Life

Badger

- 2.3.1 A thorough search for badger activity was carried out. The survey area covered the site (as annotated on **Figure 1**) and extended to accessible land within a radius of 50 metres from the site boundary. Private gardens were excluded from the survey.
- 2.3.2 Surveys were conducted in accordance with guidance presented within *Badgers and Development* (Natural England, 2007) and *Badgers: surveys and mitigation for development projects* (Natural England, 2015).
- 2.3.3 The following signs of badger activity were searched for:
- a. Sett entrances, e.g. entrances that are normally 25 to 35cm in diameter and shaped like a 'D' on its side;
 - b. Large spoil heaps outside sett entrances;
 - c. Bedding outside sett entrances;
 - d. Badger footprints;
 - e. Badger paths;

- f. Latrines;
- g. Badger hairs on fences or bushes;
- h. Scratching posts; and
- i. Signs of digging for food.

2.3.4 Habitats within and surrounding the site were assessed in terms of their suitability for use by foraging and sheltering badger in accordance with their known habitat preferences as detailed in current guidance and *Badger* (Roper, 2010).

Bat Species

Daylight Survey: Trees

2.3.5 A preliminary assessment of the trees within the site was conducted to assess their suitability for use by roosting bats, and to inform whether further surveys or precautionary measures were required.

2.3.6 Trees were assessed from the ground using binoculars and a high-powered torch. Each tree was searched for the presence of the following features:

Woodpecker holes, rot holes, hazard beams, other vertical or horizontal cracks or splits in stems and branches, partially decayed platey bark, knot holes, man-made holes, tear-outs, cankers in which cavities have developed, other hollows or cavities, including butt-rots, double-leaders forming compression forks with included bark, gaps between overlapping stems or branches, partially detached Ivy (Hedera helix) with stem diameters in excess of 50mm and bat, bird or dormouse (Muscardinus avellanarius) boxes.

2.3.7 Terms used to describe any features present follow (where possible) those outlined and described in *Bat Tree Habitat Key, 2nd Edition* (Andrews, H (ed), 2013).

2.3.8 The requirement for further presence / absence surveys at each tree was then considered.

Habitat Assessment for Commuting / Foraging Bats

2.3.9 Habitats within and adjacent to the site were assessed for their value and suitability for commuting and foraging bats in accordance with Table 4.1 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*, (Collins, J. (ed), 2016). Reference has been made using the following categories and descriptions / examples, presented at **Table 2.1**, below.

Table 2.1: Consideration of Suitability of Foraging and Commuting Habitat for Bats

Suitability	Commuting Habitat	Foraging Habitat
Negligible	Negligible habitat features on site likely to be used by commuting or foraging bats.	
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated i.e. not very well connected to the surrounding landscape by other habitat.	Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree or patch of scrub.
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.	Habitat that is linked to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	Continuous, high-quality habitat that is well connected to the wider landscape and is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. Habitats close to and connected to known roosts.	High-quality habitat that is well-connected to the wider landscape and is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Habitats close to and connected to known roosts.

Bird Species

- 2.3.10 Bird species observed and heard during the survey were recorded.
- 2.3.11 Habitats throughout the site and in the immediate surrounding area were assessed for their value to roosting, feeding and nesting birds, as indicated by the amount of shelter, feeding value, woody vegetation structure and species diversity of tree and shrub species in the site.

Great Crested Newt

- 2.3.12 In accordance with the current Natural England guidance all ponds within an unobstructed 500 metres of a site should be considered for their suitability to support breeding Great crested newts. The potential of the proposed development to impact upon any great crested newt population(s) whose breeding ponds are within 500 metres must be considered.
- 2.3.13 The search of habitats in the wider area up to a distance of 500 metres from the site boundary revealed the presence of two ponds. One of these ponds was created in association with a new housing development to the south of the site. However, the pond was only created in early 2013 and the new housing development acts as a barrier to the dispersal of any amphibians between the pond and the site; it has not been considered necessary to further consider this pond in relation to the proposed development at the site.
- 2.3.14 Two previously existing ponds (Ponds 2 and 3) have been removed by the new housing development at the south of the site. Both ponds were surveyed by ERAP Ltd in 2010; the 2010 survey results for Ponds 2 and 3 are included in this report for ease of reference.
- 2.3.15 Aerial photographs also indicate a seasonal pond in the south-west corner of the adjacent field to the west of the site, however previous surveys conducted by ERAP Ltd in this area have shown that the area is bare trampled earth and not a seasonal pond.
- 2.3.16 A single pond (Pond 1) is located adjacent to the eastern site boundary at grid reference SD 5257 3392.
- 2.3.17 ERAP Ltd conducted a great crested newt survey in the local area in 2010 in connection with a residential development to the south of the site, and Pond 1 was included in this survey. For the reasons outlined at **Section 3.3**, below, it is considered that these data remain valid, and are suitable to inform this application.

Habitat Suitability Index Assessment

- 2.3.18 Pond 1 was assessed using the Habitat Suitability Index (HSI) (Oldham, et al., 2000). The pond was examined with reference to the ten HSI scoring criteria, which are: **SI₁**: Geographical location; **SI₂**: Pond area; **SI₃**: Pond drying; **SI₄**: Water quality (as indicated by the diversity of aquatic plants and invertebrates); **SI₅**: Shade; **SI₆**: Waterfowl; **SI₇**: Fish; **SI₈**: Abundance of other ponds within a one kilometre radius; **SI₉**: Quality of terrestrial habitat; and **SI₁₀**: Macrophyte cover (i.e. aquatic and emergent plants). The survey was conducted in accordance with *ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom* (ARG UK, 2010).
- 2.3.19 An indication of the aquatic invertebrate diversity was obtained through the use of a fine-mesh, long-handled pond net, which was swept through the ponds at intervals around their margins.
- 2.3.20 The assessment followed guidance in relation to interpreting HSI scores, following the categorical scale shown at **Table 2.2**, below.

Table 2.2: Pond Habitat Suitability Index Categories

HSI Score	Pond Suitability for Great Crested Newt
<0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

Assessment of Terrestrial Habitat

- 2.3.21 An assessment of the terrestrial habitat within the site for great crested newts was conducted, as informed by the *Great Crested Newt Mitigation Guidelines* (English Nature, 2001) and the *Great Crested Newt Conservation Handbook* (Langton, 2001).
- 2.3.22 Habitats present within the site were assessed for their value to support foraging, sheltering and hibernating great crested newt. Favourable habitats can comprise rough grassland, scrubland, woodland and sites with underground crevices or cracks, such as mammal holes, voids in tree stumps or banks, and refugia such as rock piles or dead wood.

Great Crested Newt Presence/Absence Survey

- 2.3.23 A licensed great crested newt presence/absence survey of Pond 1 was undertaken between 24th April and 6th June 2010. Pond 2 (since removed) was too shallow to trap with bottle traps in 2010 and no water was present to apply the torchlight survey methodology.
- 2.3.24 The surveys were carried out in accordance with the *Great Crested Newt Mitigation Guidelines* (English Nature, 2001) and comprised application of the following methods:
- a. **Torchlight searches:** This involved shining a powerful torch (Clulite CB2 and Clulite CLU10, both 1,000,000 candle power) into the pond margins at night during suitable weather conditions (above 5°C), identifying the amphibian species and counting the number of each species of amphibian;
 - b. **Egg Search:** Submerged, emergent and water-margin vegetation, including the leaves of terrestrial plants that had fallen into the water, was checked in daylight for the presence of great crested newt eggs. The egg searches were used to determine presence or absence only; eggs were not counted because opening the leaves enclosing the eggs can expose the eggs and developing newt larvae to predators and to other threats. Care was taken at all times to ensure that the eggs were not left exposed or damaged;
 - c. **Bottle Trap Surveys:** Bottle traps constructed from two litre plastic bottles were set around the pond at a spacing of one trap every two metres. An air bubble was always provided to ensure that newts and other amphibians did not drown. The traps were set and left overnight during suitable weather (above 5°C). The traps were emptied the following morning and all captured amphibians were recorded and returned to the pond;
 - d. **Terrestrial Searches:** In addition to the surveys of the aquatic habitats suitable debris throughout the site and the surrounding area (particularly in close proximity to the pond) was lifted and searched for the presence of amphibians; and
 - e. **Netting:** Long handled pond nets (20 millimetre in diameter with a three millimetre mesh size) were used for sampling the pond margins for amphibians where access was possible.
- 2.3.25 All great crested newt surveys were conducted during suitable weather conditions (refer to **Table 8.6**). All detected amphibians were identified to species level and sexed.
- 2.3.26 Great crested newt surveys were completed by Mr Richard Lowe B.Sc. (Hons) and an assistant. All surveyors were accredited agents under Victoria Burrows' (great crested newt survey licence (licence number 201001440, valid until 5th April 2011 (at the time of the survey)). All surveyors have extensive

experience of the appropriate survey methodology, the identification of all species of amphibian and the specifications in the *Great Crested Newt Mitigation Guidelines* (English Nature, 2001).

Reptile Species

- 2.3.27 The site and its surroundings were assessed in terms of their suitability for use by reptile species using the important characteristics for reptiles outlined in the draft document ‘*Reptile Mitigation Guidelines*’ (Natural England, 2011), and the *Reptile Habitat Management Handbook* (Edgar, et al., 2010). These habitat characteristics are outlined in **Table 2.3**, below.

Table 2.3: Important Habitat Characteristics for Reptiles

1. Location (in relation to species range)	7. Connectivity to nearby good quality habitat
2. Vegetation Structure	8. Prey abundance
3. Insolation	9. Refuge opportunity
4. Aspect	10. Hibernation habitat potential
5. Topography	11. Disturbance regime
6. Surface geology	12. Egg-laying site potential

- 2.3.28 Further information relating to reptile surveys undertaken at the site is presented at **Appendix A**.

Water Vole

- 2.3.29 No ditches, water courses or other habitats suitable for use by water vole are present within the site boundary. The presence of water vole at the site is reasonably discounted and no further survey is required.

2.4 Survey Limitations

- 2.4.1 ERAP Ltd conducted a great crested newt survey in the local area in 2010 in connection with a residential development to the south of the site, and Pond 1 was included in this survey. For the reasons outlined at **Section 3.3**, below, it is considered that these data remain valid, and are suitable to inform this application.
- 2.4.2 All areas of the site were fully accessible at the time of the survey, which was conducted at a suitable time of year and under favourable conditions. No survey limitations were experienced.

2.5 Evaluation Methodology

- 2.5.1 The habitats, vegetation and animal life were evaluated with reference to standard nature conservation criteria as described in *A Nature Conservation Review* (Ratcliffe, 1977) and *Guidelines for the Selection of Biological SSSIs* (Bainbridge, et al., 2013). These are size (extent), diversity, naturalness, rarity, fragility, typicality, recorded history, position in an ecological or geographical unit, potential value and intrinsic appeal.
- 2.5.2 Habitats have been assessed to determine whether they meet those described in *UK Biodiversity Action Plan: Priority Habitat Descriptions* (Maddock, A (ed), 2008); these lists are used to help draw up the statutory lists of Priority Habitats, as required under Section 41 of the *Natural Environment and Rural Communities (NERC) Act 2006*. Where suitable, the ecological value of the habitats present have been assessed using the terms outlined in *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd Edition* (CIEEM, 2016).
- 2.5.3 Government advice on wildlife, as set out in the *National Planning Policy Framework* (Great Britain Department for Communities and Local Government, 2012) and associated government circulars has been taken into consideration. Legislation relating to protected species, such as those listed under Schedules 1, 5, 6 and 8 of the *Wildlife and Countryside Act 1981* (as amended) and *The Conservation of Habitats and Species Regulations 2010* (as amended), is referenced where applicable, and any impacts to protected species are evaluated in accordance with current guidance.

- 2.5.4 The presence of any Priority Species, as listed under Section 41 of the *NERC Act 2006* is noted, and habitats are assessed in terms of their suitability and value for these species. The presence of habitats and/or species listed by the Lancashire BAP Provisional Long List has been taken into account in the evaluation of the site.

3.0 SURVEY RESULTS

3.1 Desktop Study

Site Designations

- 3.1.1 The land within the site has no statutory or non-statutory designation for nature conservation. No statutory designated sites lie within a six kilometre radius of the site.
- 3.1.2 The site lies within the Site of Special Scientific Interest (SSSI) Impact Risk Zones for the Red Scar and Tun Woods SSSI (six kilometres east of the site) and Newton Marsh SSSI (eight kilometres south-east of the site).
- 3.1.3 In accordance with the SSSI Impact Risk Zones, Natural England should be consulted in relation to the following activities:

'Airports, helipads and aviation proposals. Solar schemes with a footprint greater than 0.5 hectares and all wind turbines. Pig and poultry units, slurry lagoons greater than 4000m². General combustion processes greater than 50 megawatts energy input including energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis / gasification, anaerobic digestion, sewage treatment works and other incineration / combustion. Landfill including inert landfill, non-hazardous landfill and hazardous landfill.'

- 3.1.4 There are no non-statutory designated sites within a one kilometre radius of the site boundary. The presence of the statutory designated sites within the wider area is considered further at **Section 4.2**.

Protected and Notable Species

- 3.1.5 The desktop study has confirmed one record of one adult male slow-worm (*Anguis fragilis*), detected on the M55 motorway west-bound (southern) verge, directly adjacent to the site boundary, on 5th April 2005. Slow worm receive protection from killing and injury under Section 5 of the *Wildlife and Countryside Act 1981* (as amended), and are a Priority Species. Further recommendations relating reptile species are made at **Appendix A**.
- 3.1.6 The desktop study has also confirmed the presence of common frog (*Rana temporaria*), a Lancashire BAP species, within the site boundary. The presence of common frog has been considered throughout this report.
- 3.1.7 No further of protected and notable species are reported for the site. Protected and notable species are reported for the wider area and are presented at **Table 3.1**, below.

Table 3.1: Records of Protected Species Within a One Kilometre Radius of the Site

Taxon Group	Species Name and Designations ¹	Notes
Terrestrial mammals	Common pipistrelle (<i>Pipistrellus pipistrellus</i>) (EPS, WCAs5, & LBAP)	One record of a roost (count of 15 bats) approximately 560 metres north-east of the site boundary. One record of bat activity approximately 900 metres south of the site boundary.
Amphibians	Great crested newt (<i>Triturus cristatus</i>) (EPS, WCAs5, PS & LBAP)	One record of approximately 150 eggs approximately 790 metres north-east of the site boundary; and one record approximately 970 metres north-east of the site boundary. Both records located on the north (i.e. the opposite side to the site) of the M55 motorway.
	Common toad (<i>Bufo bufo</i>) (PS)	One record approximately 790 metres north-east of the site boundary; one record approximately 130 metres south of the site boundary (pond no longer present); and one record approximately 230 metres south of the site boundary.
	Common frog (<i>Rana temporaria</i>) (LBAP)	One record approximately 130 metres south of the site boundary (pond no longer present); one record approximately 230 metres south of the site boundary; one record approximately 580 metres north of the site boundary; one record approximately 930 metres north-east of the site boundary; and three records approximately 780 metres north-east of the site boundary.
Reptiles	Slow-worm (WCAs5 & PS)	One record approximately 685 metres north-west of the site boundary; and one record approximately 750 metres south of the site boundary.
Bird	PS Curlew, house sparrow, tree sparrow, dunnoek, bullfinch, starling and song thrush.	
	LBAP Swift, house martin, oystercatcher, swallow, lesser black-backed gull, shelduck and willow warbler.	
Insect	Dot moth (PS), ruddy darter (LBAP)	
Flowering plant	Bluebell (LBAP), Melancholy Thistle (LBAP), Bristly Oxtongue (LBAP) and Small Pondweed (LBAP)	
<p>¹Key to Designation Codes: EPS = European Protected Species under the <i>Conservation of Habitats and Species Regulations 2010</i> (as amended). WCAs5 = Species receives full protection under Schedule 5 of the <i>Wildlife and Countryside Act 1981</i> (as amended). PS = Priority Species listed under Section 41 of the NERC Act 2006 LBAP = Species listed on the Lancashire Biodiversity Action Plan Provisional Long List</p>		

3.1.8 The presence of these protected and notable species within the wider area has been taken into account throughout this report.

3.2 Vegetation and Habitats

General Description

- 3.2.1 The approximately two hectare site is located at the northern extremity of Fulwood, associated with the M55 and comprises species poor semi-improved grassland, tall-herb vegetation and hedgerows. The site boundaries are fenced.
- 3.2.2 The M55 motorway and its associated motorway verges lie directly beyond the northern site boundary. An ongoing residential development is located to the east and south of the site boundary. Beyond the western site boundary lies a grazed pasture similar in vegetative structure and composition to that of the site.
- 3.2.3 Habitats within the site boundary remain as described in the 2013 and 2015 ecology reports, as presented below. The grazing regime described in the previous surveys remains ongoing.
- 3.2.4 For all habitat descriptions refer to the Phase 1 Habitat Survey map appended at **Figure 2**. Photographs are appended at **Table 8.2**.

Species poor semi-improved grassland

- 3.2.5 The species poor semi-improved grassland is a grazed pasture with hedgerows at its southern and eastern boundaries, refer to **Photo 1**. At the time of surveys the field was grazed by sheep.
- 3.2.6 The vegetation is characterised by constant and frequent Creeping Bent (*Agrostis stolonifera*), Common Mouse-ear (*Cerastium fontanum*), Red Fescue (*Festuca rubra*), Yorkshire-fog (*Holcus lanatus*), Soft-rush (*Juncus effusus*), Perennial Rye-grass (*Lolium perenne*), Meadow Buttercup (*Ranunculus acris*), Creeping Buttercup (*Ranunculus repens*) and White Clover (*Trifolium repens*).
- 3.2.7 The grazed semi-improved pasture is characteristic of an *MG10 Yorkshire-fog – Soft-rush* (Rodwell, 1992) rush-pasture community of the NVC. A plant species list is appended at **Table 8.1**.

Hedgerows

- 3.2.8 The site contains two hedgerows, refer to **Photos 4** and **5**.
- 3.2.9 Hedgerow 1 is approximately 230 metres long and is unmanaged. It is characterised by constant and frequent Hawthorn (*Crataegus monogyna*) and Field Maple (*Acer campestre*) with locally frequent Sycamore (*Acer pseudoplatanus*) and Horse Chestnut (*Aesculus hippocastanum*). The ground flora is characterised by locally frequent Bramble (*Rubus fruticosus* agg.) and Upright Hedge-parsley (*Torilis japonica*).
- 3.2.10 Hedgerow 2 is approximately 100 metres long and is characterised by constant and abundant Hawthorn with occasional Pedunculate Oak (*Quercus robur*), its ground flora is characterised by constant and frequent Common Nettle.
- 3.2.11 Both hedgerows are the *W21 Hawthorn – Ivy* scrub community of the NVC. Neither hedgerow is 'important' in accordance with the *Hedgerows Regulations 1997*. Plant species lists and assessment under *The Hedgerows Regulations 1997* for both hedgerows are appended at **Tables 8.3** and **8.4**.

Invasive Species

- 3.2.12 No Japanese Knotweed or any other invasive species, as listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), is present at the site.

Habitats beyond the site boundary

- 3.2.13 The verge associated with the M55 motorway and which lies directly beyond the northern site boundary contains a mixture of grasses and tall-herb vegetation with scattered trees, refer to **Photo 3**. The verge is unmanaged.
- 3.2.14 The mixture of grasses and tall-herb vegetation is characterised by constant and frequent Common Bent (*Agrostis capillaris*), Creeping Thistle (*Cirsium arvense*), Cock's-foot, Common Couch (*Elytrigia repens*), Red Fescue, Yorkshire-fog, Perennial Rye-grass, Meadow Buttercup and Creeping Buttercup with constant and locally very frequent to frequent Hogweed (*Heracleum sphondylium*) and Common Nettle. A plant species list is appended at **Table 8.2**.
- 3.2.15 Tree Group 1 is present beyond the northern site boundary of Field 1. The tree group comprises five immature to semi-mature Pedunculate Oak (*Quercus Robur*) and one semi-mature Ash (*Fraxinus excelsior*).

3.3 Animal Life

Badger

- 3.3.1 No badger activity was detected within the study area. The habitats within the site are not suitable for use by badger as they are highly disturbed.
- 3.3.2 There are no areas of favourable habitat for badger within or connected to the site; the northern boundary of the site is marked by the M55 Motorway, a significant barrier to badger movements. To the east of the site lie further grassed field units and housing.
- 3.3.3 To the west of the site lies further field units. The nearest suitable habitat for sheltering badger lies over 400 metres to the west of the site, across a railway track. No records of badger are reported for the site or the surrounding area.
- 3.3.4 The presence of badger is reasonably discounted.

Bat Species

Daylight Survey: Trees

- 3.3.5 No trees within the site are suitable for use by roosting bats.

Commuting and Foraging Bats

- 3.3.6 The site provides open habitat with boundary hedgerows and tree-lines which is suitable, if of poor quality, for use by foraging bats associated edge habitats, such as pipistrelle species. However the site does not support or lie adjacent to any areas of mature trees or woodland, and does not support any significant waterbodies or other features which would significantly enhance the suitability of the site for use by foraging or commuting bats, or provide suitable habitats for a variety of bat species.

Bird Species

- 3.3.7 No bird species were detected in the site in November 2013, March 2015 or September 2017. Habitats within the site including the hedgerows and scattered trees and shrubs are suitable for use by nesting birds. The site is not suitable for ground nesting birds as the habitats within the site are highly disturbed by the close proximity to the M55 motorway to the north and the busy B6241 (Eastway) to the south. The site is also heavily grazed.
- 3.3.8 The presence of habitats suitable for use by nesting birds is considered further at **Section 4.4**, below.

Great Crested Newt and other Amphibians

3.3.9 Pond 1 is located adjacent to the site boundary. A Habitat Suitability Index (HSI) assessment of the pond was conducted and the results are given at **Table 3.2**, below.

Table 3.2: Habitat Suitability Index Assessment for Pond 1

Criteria	Description	Pond 1	Score ¹
SI ₁	Location	Zone A	1.0
SI ₂	Pond Area	500m ²	1.0
SI ₃	Permanence	Never dries	0.9
SI ₄	Water Quality	Poor	0.33
SI ₅	Shade	0%	1.0
SI ₆	Waterfowl	Absent	1.0
SI ₇	Fish	Possible	0.67
SI ₈	Pond count ²	1	0.35
SI ₉	Terrestrial habitat	Poor	0.33
SI ₁₀	Macrophyte cover	100%	0.8
Assessment Result:		Average	0.67
¹ Calculated by (SI ₁ x SI ₂ x SI ₃ x SI ₄ x SI ₅ x SI ₆ x SI ₇ x SI ₈ x SI ₉ x SI ₁₀) ^{1/10}			
² Ponds within an unobstructed one kilometre radius			

3.3.10 The assessment of Pond 1 is 'average'.

3.3.11 The full results of the great crested newt survey, carried out in 2010, are presented at **Table 8.6**. A summary of the results is presented in **Table 3.3** below.

Table 3.3: Summary of Great Crested Newt Survey Results 2010

Pond	GCN	SN	PN	CF	CFT	CT	CTT	Fish
Pond 1	0	5(t)	0	P	P	0	P	0
Pond 2	0	3 (t)	0	P	P	0	P	P (carp)
Pond 3	0	0	0	0	0	0	0	0
TOTAL	0	8	0	P	P	0	P	P

KEY: - GCN = Great Crested Newt, SN = Smooth Newt, PN = Palmate Newt, CF = Common Frog, CFT = Common Frog tadpole, CT = Common Toad, CTT = Common Toad tadpole, P = Present
Note: The numbers presented in the summary above is the maximum number of each species recorded by bottle trap (b) or torchlight (t) during one survey repetition.
Note: Ponds 2 and 3 have subsequently been removed as part of an approved development.

3.3.12 No great crested newts were detected at the ponds.

3.3.13 Three amphibian species were recorded in total (smooth newts, common toad and common frog). Pond 1 supports three amphibian species, including a small population (1-10) of smooth newt.

3.3.14 There are no further ponds located within an unobstructed one kilometre radius of Pond 1. Given that no great crested newts were discovered in the 2010 surveys, and that there are no ponds within an unobstructed one kilometre of the pond from which great crested newt could have colonised the pond, it is concluded that updated great crested newt surveys are not required at the site to inform this planning application; the presence of great crested newt is reasonably discounted at Pond 1.

3.3.15 It is recommended as best practice that Reasonable Avoidance Measures (RAMs) for the protection of amphibian species are implemented at the site.

3.3.16 Recommendations relating to the protection of amphibian species are presented at **Section 5.5**.

Reptiles

3.3.17 The habitats within the site are regularly disturbed and provide little by way of vegetative structure, shelter or foraging habitat for use by reptile species.

Table 3.4: Habitat Assessment of the Site for Reptiles

Characteristic	Site Description
1. Location (in relation to species range)	Record of slow worm directly adjacent to northern site boundary. Two further records of reptile species are present for the wider area (beyond 600 metres from the site boundary).
2. Vegetation Structure	Varied. The site contains a mixture of hedgerows, trees and shrubs, grassland and pond.
3. Insolation	The site is not shaded by its boundaries and is open.
4. Aspect	The site is more-or-less level.
5. Topography	The site has a constant topography.
6. Surface geology	The site is composed of brown earth soils.
7. Connectivity to nearby good quality habitat	The motorway verge directly beyond the northern site boundary is suitable for use by reptile species and there is one record of slow-worm being present. The motorway verge connects the site to a railway cutting located approximately 290 metres west of the site, which is suitable for use by reptile species. One record of sand lizard is recorded approximately 685 metres north of the site; however the M55 motorway acts as a barrier to dispersal from this site. Further, sand lizards are now exceedingly rare in Great Britain and restricted to coastal habitats. One record of slow-worm is also present approximately 750 metres south of the site, however existing residential developments act as a barrier to dispersal toward the site. Habitat to the west and south of the site boundary is not suitable for use by reptile species as the habitats contain existing and ongoing residential developments.
8. Prey abundance	The site contains suitable habitats for a variety of invertebrates including spiders, grasshoppers, crickets, bugs, flies, slugs and worms.
9. Refuge opportunity	No habitats favourable for sheltering reptiles are present within the site, although some suitable shelter may be present under the hedgerows at the site boundaries.
10. Hibernation habitat potential	No habitats favourable for hibernating reptiles are present within the site, although some hibernation potential may be present at tree roots at the site boundaries.
11. Disturbance regime	The site is grazed (at the time of the survey the site is grazed by sheep), however the site is not otherwise regularly disturbed.
12. Egg-laying site potential ¹	None

¹ Characteristic 12 is relevant to grass snake and sand lizard only

3.3.18 In summary, habitats within the site are of low suitability for basking, foraging and sheltering reptile species, including slow-worm. However the habitat directly adjacent to the northern site boundary is suitable for reptile species and there is a record of slow-worm close to the site boundary from 2005.

3.3.19 Recommendations relating to reptile species are presented at **Section 5.6**.

3.3.20 Reptile surveys were undertaken at the site in 2014. The results are presented at **Appendix A**.

4.0 EVALUATION AND ASSESSMENT

4.1 Introduction and Description of Proposals

4.1.1 It is proposed to develop the site to commercial and community use.

4.1.2 **Section 4.2** provides an assessment of any impacts of the proposed development on the designated sites in the wider area. The ecological value of habitats within the site are evaluated at **Section 4.3**, and the presence of protected and notable species is considered at **Section 4.4**.

4.1.3 Impacts upon the habitats within (and surrounding) the site, and upon the protected and notable species associated with the site, are quantified and assessed at **Section 4.5**.

4.2 Designated Sites

- 4.2.1 There are no statutory or non-statutory designated sites within a one kilometre radius of the site boundary. The development will have no impact on designated sites.

4.3 Vegetation and Habitats

- 4.3.1 Both hedgerows within the site are Priority Habitat. Neither hedgerow is '*important*' in accordance with *The Hedgerows Regulations 1997*. Recommendations for the retention and protection of these features, and for the incorporation of further hedgerows into the landscape design of the proposed development, are presented at **Section 5.0**.
- 4.3.2 Hedgerows increase the connectivity throughout the site for Priority Species such as hedgehog, and provide suitable nesting habitats for bird species.
- 4.3.3 No further Priority Habitats are present within the site. The site contains only common and widespread plant species. No species-rich or semi-natural habitats are present within the site.

4.4 Protected Species and Other Wildlife

- 4.4.1 Habitats within the site are of low suitability for use by reptile species, although the desktop study reported one record of an adult slow-worm directly adjacent to the northern site boundary in April 2005. Recommendations relating to the protection of reptile species are presented at **Appendix A**.
- 4.4.2 Habitats within and adjacent to the site are suitable for foraging and commuting bats. Recommendations relating to the retention of features suitable for use by foraging and commuting bats, and features to enhance habitats for roosting bats at the site are presented at **Section 5.3**.
- 4.4.3 The trees, shrubs and hedgerows provide favourable foraging and nesting habitat for the species of birds detected within the site and the wider area via the records search. Consideration of birds, including protection of breeding birds and recommended enhancements for Priority Species are presented at **Section 5.4** of this report.
- 4.4.4 The 2010 great crested newt survey reported that Pond 1 within the site boundary supports common toad (a UK BAP Priority Species) and common frog (a Lancashire BAP species). Further recommendations relating to amphibian species are presented at **Section 5.5**.
- 4.4.5 The presence of any other protected species within the site is reasonably discounted.

4.5 Assessment of Impacts

- 4.5.1 The proposed development at the site includes the development of a 'Local Centre'. The recommendations in this report and subsequent Appendices should be used to inform the masterplan.
- 4.5.2 The trees and hedgerows within the site are of local value to nesting birds and it is recommended that these are retained and protected during construction where feasible to facilitate the development.
- 4.5.3 Due to the close proximity of Pond 1 to the eastern site boundary it is recommended that a minimum 10 metre undeveloped buffer is implanted at the site to retain and protect the pond. The undeveloped buffer will provide protection for amphibian species such as common toad. Recommendations are presented at **Section 5.5**.
- 4.5.4 Mitigation for the protection of reptiles is feasible and a mitigation strategy is presented at **Appendix A**.
- 4.5.5 The proposals present an opportunity to enhance the wildlife potential of the site for foraging and commuting bats, Priority Species of bird associated with the habitats present within the site and for hedgehog by the

planting of native species of trees and shrubs and by incorporating bat boxes and bird boxes into the design of the site.

5.0 RECOMMENDATIONS AND ECOLOGICAL ENHANCEMENT

5.1 Introduction

- 5.1.1 These recommendations aim to ensure that the development is implemented in accordance with all wildlife legislation, Natural England guidance, the principles of the National Planning Policy Framework (NPPF), local planning policy and best practice.
- 5.1.2 The recommendations address the potential impacts identified in **Section 4.0** and are appropriate and proportionate. Where possible, opportunities to enhance the ecological interest and habitat connectivity and seek biodiversity gain through appropriate landscape planting and habitat creation have been identified, as required by the NPPF and other relevant planning documents.
- 5.1.3 All recommendations are appropriate to the geographical area, the habitats in the wider area, the wildlife present in the local area (and likely to use the site post-construction) and take into consideration the end use of the site as a Local Centre development.

5.2 Protection of Existing Vegetation and Recommendations in Relation to Site Layout

- 5.2.1 During the construction phase, temporary protective demarcation fencing will be used to protect the trees and shrubs to be retained. The fencing must extend outside the canopy of the retained trees and must remain in position until all area have been developed to ensure protection is provided throughout the construction phase.
- 5.2.2 The fencing will be in accordance with BS5837:2012 *Trees in Relation to Design, Demolition and Construction: Recommendations* (BSI, 2012).

Pond 1

- 5.2.3 Due to the close proximity of the development to Pond 1 boundary it is recommended that a minimum 10 metre undeveloped buffer is implanted at the site to retain and protect the pond. Further recommendations are presented at **Section 5.5**.

5.3 Bats

Lighting

- 5.3.1 Paragraph 125 in Chapter 11 (conserving and enhancing the natural environment) of the National Planning Policy Framework (NPPF) states:

“By encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation”.

Construction Phase

- 5.3.2 Any lighting to be used at the site during construction should be directional and screened where possible, this specification should be included within a Construction Environment Management Plan (CEMP), or similar.

Development Lighting Design

- 5.3.3 The lighting scheme to be implemented at the developed site must involve the use of appropriate products and screening, where necessary, to ensure no excessive artificial lighting shines over the hedgerows, new pond and any landscape planting, as lighting overspill may deter use by wildlife such as foraging bats.
- 5.3.4 The lighting scheme will be designed with reference to current guidance, namely:
- a. *Artificial lighting and wildlife. Interim Guidance: Recommendations to help minimise the impact of artificial lighting.* (Bat Conservation Trust, 2014); and
 - b. *Bats and lighting: Overview of current evidence and mitigation guidance* (Stone, 2014).

Enhancing Habitats for Roosting Bats

- 5.3.5 It is recommended that the development incorporates the installation of one commercially available bat access panel at the new buildings.
- 5.3.6 The bat access panel should be sited at least four metres above ground level, ideally facing or close to areas of landscape planting or existing linear features. The access panel should not be positioned over windows or doorways where bat droppings may become a nuisance. Once the development layout has been finalised, an Ecologist should advise on appropriate positions for the bat access panels. Suitable bat access panels are available from NHBS Ecology (www.nhbs.com) or Wild Care Shop (www.wildcareshop.com) and are presented at **Insert 1**, below:



Insert 1: Example of commercially available bat access panels.

5.4 Birds

Protection

- 5.4.1 All wild birds are protected under the *Wildlife and Countryside Act 1981* (as amended) while they are breeding. It is advised that any works such as vegetation clearance that will affect habitats suitable for use by nesting birds are scheduled to commence outside the bird nesting season. Commencement of works in the nesting season must be informed by a pre-works nesting bird survey, carried out by a suitably experienced ecologist. The bird breeding season typically extends between March to August inclusive.
- 5.4.2 If breeding birds are detected the Ecologist will issue guidance in relation to the protection of the nesting birds in conjunction with the scheduled works. This may involve cordoning off an area of the site until the young birds have fledged.

Enhancing Habitats for Nesting Birds

- 5.4.3 The installation of four 1MR Schwegler Avianex nest boxes is recommended at the proposed new buildings. The boxes will not be positioned over windows or doorways where droppings may become a nuisance. RSPB advice states that boxes should ideally be sited facing north to east, to avoid exposure to direct sunlight, which may cause overheating of chicks in the nest. Once the development layout has been finalised, an Ecologist should advise on appropriate positions for the nest boxes. An example of a suitable house sparrow bird box is given below, in **Insert 2**, below:



Insert 2: Schwegler 1MR Avianex nest box

- 5.4.4 Such bird boxes are available from the NHBS (www.nhbs.com) or Wild Care Shop (www.wildcareshop.com). ERAP Ltd will advise on the siting of bird boxes.

5.5 Protection of Wildlife (including amphibian species)

- 5.5.1 Reasonable Avoidance Measures for the protection of wildlife (including common toad), prior to site clearance and during construction are proposed for the site. The Reasonable Avoidance Measures are presented below.

Reasonable Avoidance Methods (RAMs)

- 5.5.2 The site is currently managed with a grazing regime. It is recommended that the current management regime is maintained and the grassland remains short until immediately prior to the commencement of construction in order that the site does not become more suitable terrestrial habitat for great crested newt prior to the commencement of works.
- 5.5.3 The following Reasonable Avoidance Measures are to be employed during the development. All site personnel are to be made aware of these avoidance measures and this Report prior to the commencement of work on site.
- a. Maintain the management of the grassland within the site until immediately prior to the commencement of construction; If grazing at the site ceases then mowing or strimming is recommended at least once a month;
 - b. If feasible undertake groundworks at the site during winter months;
 - c. Ensure all machinery remains within the site boundary;
 - d. Cover or infill all trenches/other excavations before nightfall;
 - e. If covering is not feasible leave a temporary ramp in all trenches/other excavations in order to allow great crested newts and other amphibian species to escape;
 - f. Raise stored materials (e.g. on pallets) in order to ensure that great crested newts and other amphibian species do not shelter in brick piles;
 - g. Educate all personnel prior to construction as to best practice with regards to the protection of great crested newts (as above);

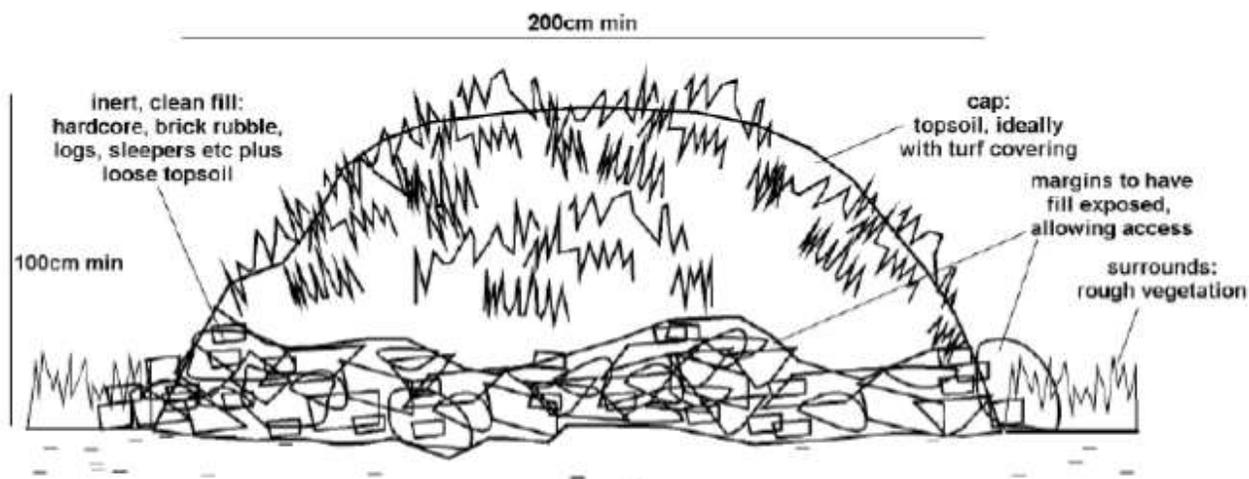
- h. Educate all personnel prior to construction to be able to identify a great crested newt;
- i. Upon discovery of a great crested newt all works must cease and a suitably qualified ecologist must be contacted for further advice (ERAP Ltd can be contacted on 01772 750502); and
- j. If any other amphibians are detected during works then these must be carefully placed within a clean bucket and immediately transported to suitable sheltered habitat outside the working area of the site.

Pond 1

- 5.5.4 Due to the close proximity of Pond 1 to the site boundary it is recommended that a minimum 10 metre undeveloped buffer is implanted at the site to retain and protect the pond.
- 5.5.5 The retention of an undeveloped 10 metre buffer at Pond 1 provides protection for species such as common toad. It is recommended that land within the undeveloped 10 meter buffer which lies within the site boundary is enhanced with two amphibian hibernacula and native wetland wildflower planting (suitable seed mix such as WFG9 Wetland and Pond Areas available from www.germinal.com).

Construction of Hibernacula

- 5.5.6 Two hibernacula will be constructed in the retained land associated with Pond 1 (within the site boundary) in accordance with Figure 3 of the *Great Crested Newt Mitigation Guidelines* (English Nature, 2001), see **Insert 3**.
- 5.5.7 Only clean, inert materials are to be used for the creation of the hibernacula. Dead wood collated during any tree removal, for example, can be used to construct the hibernacula.



Insert 3: Great Crested Newt Hibernacula design

5.6 Reptile Species

- 5.6.1 The results of the reptile survey and mitigation strategy are presented at **Appendix A**.

5.7 Landscape Planting

- 5.7.1 It is recommended that the landscape planting within the site is composed from native species and species known to be of value for the attraction of wildlife
- 5.7.2 It is recommended that trees which support blossom and fruit which will attract insects are incorporated into the landscape planting. Suitable species are presented at **Table 5.1**, below.

Table 5.1: Suitable Native Species for Tree and Shrub Planting

Scientific Name	Common Name	Scientific Name	Common Name
<i>Acer campestre</i>	Field Maple	<i>Prunus spinosa</i>	Blackthorn
<i>Corylus avellana</i>	Hazel	<i>Rosa arvensis</i>	Field Rose
<i>Crataegus monogyna</i>	Hawthorn	<i>Rosa canina</i>	Dog-rose
<i>Ilex aquifolium</i>	Holly	<i>Sambucus nigra</i>	Elder
<i>Malus sylvestris</i>	Crab Apple	<i>Sorbus aucuparia</i>	Rowan
<i>Prunus avium</i>	Wild Cherry	<i>Ulmus glabra</i>	Wych Elm
<i>Prunus padus</i>	Bird Cherry	<i>Viburnum opulus</i>	Guelder Rose

- 5.7.3 The understorey and ground cover planting design should be prepared to optimise the attraction of invertebrates such as feeding bumblebees and butterflies. Where possible the use of native species should be maximised but where necessary non-native species known to be attractive to invertebrates should be used.
- 5.7.4 Planting schemes that include flowering species such as *Viburnum*, *Ceanothus*, *Hebe*, *Lavendula*, *Lonicera*, *Potentilla*, *Rosmarinus* and *Vinca* can maximise opportunities for feeding invertebrates and for the attraction of foraging bats and birds.
- 5.7.5 For further plants suitable for the attraction of pollinators please refer to the *Perfect for Pollinators Plant List* (Royal Horticultural Society, 2012). It is recommended that the selection of plant species at the site ensures that a variety of flowering species are available throughout the year.

6.0 CONCLUSION

- 6.1.1 This ecological appraisal has demonstrated that a commercial and community development at the site is feasible and acceptable in accordance with ecological considerations and the principles of the National Planning Policy Framework.
- 6.1.2 Mitigation and provision of habitats for protected species (slow-worm) and other fauna namely amphibian species, and nesting birds is recommended and is entirely feasible within the remit of the proposals.
- 6.1.3 The proposals will provide an opportunity to secure ecological enhancement for fauna such as breeding birds and roosting bats.

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8.0 APPENDIX: TABLES AND FIGURES

Table 8.1: Plant Species List for grassland Land North of Eastway

Scientific Name	Common Name	DAFOR ¹	Cover
	Moss species	VLA	<1%
<i>Agrostis stolonifera</i>	Creeping Bent	O	5%
<i>Cerastium fontanum</i>	Common Mouse-ear	F*	5%
<i>Chamerion angustifolium</i>	Rosebay Willowherb	LF	<1%
<i>Cirsium arvense</i>	Creeping Thistle	LF	<1%
<i>Cirsium vulgare</i>	Spear Thistle	LF	<1%
<i>Dactylis glomerata</i>	Cock's-foot	LF	5%
<i>Festuca rubra</i>	Red Fescue	LA	<1%
<i>Holcus lanatus</i>	Yorkshire-fog	F*	25%
<i>Juncus effusus</i>	Soft Rush	F*	15%
<i>Lolium perenne</i>	Perennial Rye-grass	F*	15%
<i>Phleum pratense</i>	Timothy	VLF	<1%
<i>Ranunculus acris</i>	Meadow Buttercup	LA	<1%
<i>Ranunculus repens</i>	Creeping Buttercup	A*	25%
<i>Rubus fruticosus</i> agg.	Bramble	LF	<1%
<i>Sparganium erectum</i>	Branched Bur-reed	VLA	<1%
<i>Trifolium repens</i>	White Clover	F*	5%
<i>Urtica dioica</i>	Common Nettle	LF	<1%

¹Key to DAFOR: D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare, V=Very, L=Local and *denotes a constant species

Table 8.2: Plant Species List for Tall-herb Vegetation at the M55 Verge, Land North of Eastway, Fulwood, Preston

Scientific Name	Common Name	DAFOR ¹	Cover
	Moss species	LA	<1%
<i>Agrostis capillaris</i>	Common Bent	F*	10%
<i>Chamerion angustifolium</i>	Rosebay Willowherb	LF	5%
<i>Cirsium arvense</i>	Creeping Thistle	F*	15%
<i>Dactylis glomerata</i>	Cock's-foot	F*	15%
<i>Dryopteris filix-mas</i>	Male Fern	F*	<1%
<i>Elymus repens</i>	Common Couch	F*	15%
<i>Epilobium montanum</i>	Broad-leaved Willowherb	LF	<1%
<i>Festuca rubra</i>	Red Fescue	F*	20%
<i>Galium aparine</i>	Cleavers	LVF	<1%
<i>Heracleum sphondylium</i>	Hogweed	F*	15%
<i>Holcus lanatus</i>	Yorkshire-fog	F*	30%
<i>Lolium perenne</i>	Perennial Rye-grass	F*	15%
<i>Poa</i> sp.	Meadow-grass species	LF	<1%
<i>Ranunculus acris</i>	Meadow Buttercup	F*	2%
<i>Ranunculus repens</i>	Creeping Buttercup	F*	2%
<i>Rubus fruticosus</i> agg.	Bramble	LA	25%
<i>Senecio jacobaea</i>	Common Ragwort	LF	<1%
<i>Stachys arvensis</i>	Field Woundwort	LF	<1%
<i>Urtica dioica</i>	Common Nettle	F*	10%
<i>Veronica</i> sp.	Speedwell species	VLA	<1%

¹Key to DAFOR: D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare, V=Very, L=Local and *denotes a constant species

Table 8.3: Plant Species Composition, Frequency and Abundance for Hedgerows 1 and 2

Scientific name	Common name	Hedgerow 1		Hedgerow 2	
		DAFOR ¹	% ²	DAFOR ¹	% ²
Woody species					
<i>Acer campestre</i>	Field Maple	F*	50%	-	-
<i>Acer pseudoplatanus</i>	Sycamore	LF	2%	-	-
<i>Aesculus hippocastanum</i>	Horse Chestnut	LF	1%	-	-
<i>Crataegus monogyna</i>	Hawthorn	F*	70%	A*	80%
<i>Fagus sylvatica</i>	Beech	VO	<1%	-	-
<i>Fraxinus excelsior</i>	Ash	VO	<1%	-	-
<i>Prunus</i> sp.	Cherry sp.	VO	<1%	-	-
<i>Quercus robur</i>	Pedunculate Oak	-	-	O	8%
<i>Rosa</i> sp.	Rose sp.	-	-	LF	5%
Herbs and grasses					
<i>Chamerion angustifolium</i>	Rosebay Willowherb	LF/VO	<1%	-	-
<i>Dactylis glomerata</i>	Cock's-foot	-	-	VLF	<1%
<i>Epilobium montanum</i>	Broad-leaved Willowherb	VLF	<1%	-	-
<i>Rubus fruticosus</i> agg.	Bramble	LF	<1%	LF	2%
<i>Torilis japonica</i>	Upright Hedge-parsley	LF	<1%	-	-
<i>Urtica dioica</i>	Common Nettle	-	-	LF*	2%

¹**Key to DAFOR:** D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, V = Very, L = Local and *denotes a constant species
²% =Percentage Cover
 Species shaded grey are those listed as either woody or woodland species in *The Hedgerows Regulations 1997*

Table 8.4: The Hedgerow Regulations 1997 Assessments Results of Hedgerows 1 and 2

Hedgerow Name	Hedgerow 1			Hedgerow 2		
Height x width (metres)	3.5 x 1.5			6 x 4		
Length (metres)	285			100		
Continuity	85%			95%		
Management	None			None		
Total Number of woody species	4			2		
Average Number of Qualifying Woody Species:						
Section number	1	2	3	1	2	3
Qualifying woody species	3	3	2	2	1	-
Average number	3			2		
Number of Features Present:						
(a) Bank or wall along at least ½ length	No			No		
(b) Gaps which in agg. do not exceed 10%	No			Yes		
(e) 1 standard tree per 50m	Yes			Yes		
(f) At least 3 woodland species within 1 metre	No			No		
(g) Ditch along at least ½ its length	No			No		
(h) Connections scoring 4 points or more	No			No		
(i) Parallel hedge within 15m	No			No		
Total Features	1			2		
Criteria for Hedgerow Importance 1: Hedgerow contains species listed as:						
(1) Part 1 of Schedule 1, Schedule 5 or Schedule 8 of W&C act 1981	No			No		
(2) Declining breeders in 'Red Data Birds of Britain'	No			No		
(3) Categorised as 'endangered', 'extinct' or 'vulnerable'	No			No		
Criteria for Hedgerow Importance 2: Hedgerow Includes (all woody species mentioned in (i)-(iv) reduced by one Lancashire for this criteria only):						
(i) At least 7 woody species	No			No		
(ii) At least 6 woody species and at least 3 features	No			No		
(iii) At least 6 woody species, inc. one of: Black Poplar, L-leaved Lime, S-leaved Lime or Wild Service Tree	No			No		
(iv) At least 5 woody species, and has 4 features	No			No		
Criteria for Hedgerow Importance 3: Is adjacent to is adjacent to a bridleway, footpath or byway and includes at least 4 woody species on average and 2 features from (a) to (g):						
Qualifies:	No			No		
Hedgerow Classed as Important?	No			No		

Table 8.5: Table of Photographs



Photo 1: Species poor semi-improved grassland



Photo 2: Species poor semi-improved grassland



Photo 3: Tall-herb vegetation on motorway verge



Photo 4: Hedgerow 1



Photo 5: Hedgerow 2



Photo 6: Pond 1

Table 8.6: Results of 2010 Great Crested Newt survey at Lightfoot Lane, Fulwood

Pond 1

	Date	Air temp	Veg. cover	Turb.	GCN	SN	PN	CF	CT	Fish
Bottle traps	25/04/2010	15	0	0	0	2m,2f	0	0	0	0
	23/05/2010	16	0	0	0	1m	0	0	0	0
	30/05/2010	12	0	0	0	1m2f	0	0	0	0
	06/06/2010	21	0	0	0	2m2f	0	*	*	0
Torch-light	24/04/2010	15	2	1	0	1m1f	0	0	0	0
	24/05/2010	13	2	1	0	3f	0	0	0	0
	29/05/2010	16	2	1	0	2m3f	0	1 & *	0	0
	06/06/2010	20	2	1	0	0	0	0	0	0
Egg search	24/04/2010	15	2	1	0	0	0	-	-	-
	23/05/2010	13	2	1	0	0	0	-	-	-
	30/05/2010	21	2	1	0	0	0	-	-	-
	06/06/2010	21	2	1	0	0	0	-	-	-

Pond 2

	Date	Air temp	Veg cover	Turb.	GCN	SN	PN	CF	CT	Fish
Netting	25/04/2010	15	0	0	0	0	0	0	0	0
	23/05/2010	13	1	0	0	0	0	0	0	0
	30/05/2010	15	0	0	0	0	0	0	0	0
	06/06/2010	21	0	0	0	0	0	0	0	0
Torch-light	24/04/2010	15	1	0	0	0	0	0	3	**
	24/05/2010	16	0	0	0	0	0	2	1	**
	29/05/2010	16	1	1	0	1f	0	1 & 1*	*	**
	06/06/2010	20	1	0	0	1m2f	0	0	2 & *	**
Egg search	24/04/2010	15	1	0	0	0	0	-	-	-
	23/05/2010	15	0	0	0	0	0	-	-	-
	30/05/2010	12	1	0	0	0	0	-	-	-
	06/06/2010	21	1	0	0	0	0	-	-	-

COMMENTS (e.g. invertebrates pond condition etc):

Pond 1: Invertebrates including leech, water louse present.

High percentage cover of vegetation available for egg laying. Deep muds present around the margins.

Pond 2: (since removed) 0.05m deep to dry. Floating Sweet-grass present and suitable for egg laying but too shallow to sustain breeding amphibians and dried out before mid June.

Pond 3: (since removed) contains 1-10 large Koi carp and fry, artificial margins offer limited cover for amphibians.

Figure 1: Google Earth Image to Illustrate the Site Boundary and Pond Location



Figure 2: Phase 1 Habitat & Vegetation Map



Figure 3: Ecological Constraints and Recommendations Plan

