

Ecological Report
Proposed Development at Petre Wood, Langho



Client: Hardgreaves Contracting Limited
Revision: 01
Issue date: 23rd May 2012

NON-TECHNICAL SUMMARY

SEP Ltd undertook an extended Phase 1 Habitat Survey of the proposed development area at land off Petre Wood Close, Langho, Lancashire BB6 8FE, (SD 709 349) and immediate surroundings over the week commencing 16th July 21012 on behalf of Hardgreaves Contracting Ltd. In particular, surveys were conducted to assess the probability of any protected species or habitats being disturbed by the proposed redevelopment. Compensation proposals and mitigation measures have been suggested to impose a net biodiversity gain to the area as a whole.

The proposed redevelopment includes the construction of 22 new homes, the area is currently predominantly wet grassland with areas of young Alder woodland, scrub and piles of rubble. A few mature trees on site would require protection through any development. There is a small drainage ditch running west to east across the site. There are no ponds within 500m of the site.

During surveying a female Grass Snake was disturbed suggesting the site may be used for breeding. Due to this discovery it recommended that prior to the start of any development a full population survey is conducted to assess if the site qualifies as a Key Reptile Site. It should be noted that even a small population will require mitigation under the Wildlife and Countryside Act 1981 (as amended).

A number of young tree groups will be lost to the development, these trees are of moderate value and the loss could be adequately compensated for by the planting of numerous native trees

No other protected species listed under the Wildlife and Countryside act 1981, schedule 1 (birds), schedule 5 (animals) and schedule 6 (plants) were discovered on land proposed for development. However; bat species were detected transecting the area. Adequate mitigation proposals to protect all wildlife and minimise disturbance will be adhered to.

Any changes in levels of the site should include mitigation measures to protect the mature trees on site and the wooded area to the north.

Depending on the findings of the recommended reptile population survey, any disturbance should be treated sensitively and adequately compensated for. Planning of the development should incorporate opportunities to improve the ecological value of the site in compliance with the National Planning Policy Framework (NPPF).



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1. INTRODUCTION

- 1.1 SEP Ltd undertook an extended Phase 1 Habitat Survey of the proposed development area at land off Petre Wood Close, Langho, Lancashire BB6 8FE, (SD 709 349) and immediate surroundings over the week commencing 16th July 21012 on behalf of Hardgreaves Contracting Ltd. (see Fig 1 and 2 for current layout and Fig 3 for proposed development).
- 1.2 The aim of the survey is to assess the current ecological value of the site and the effect the proposed development may have on it and the surrounding areas. In particular, surveys were conducted to assess the probability of any protected species or habitats being disturbed by the proposed redevelopment. Compensation proposals and mitigation measures have been suggested to impose a net biodiversity gain to the site as a whole.
- 1.3 For the purposes of this report, protected species are those listed on Schedules 1, 5 and 9 of the Wildlife and Countryside Act 1981 (as amended*) and those protected under the Conservation (Natural Habitats & c) Regulations 1994 and The Protection of Badgers Act 1992. Notable species are those listed within the Species of Principal Importance list of Planning Policy Statement 9 (PPS9), and those included in Local and National (UK) Biodiversity Action Plans (BAP) and within the Red Data Book as being rare or notable.
- 1.4 In order to assess a habitat or sites potential to support protected or notable species, several factors are considered, including (but not limited to):
 - *Habitat structure and type*: All species have specific habitat requirements. The structure of the habitat (density etc.) is often as important as the type of habitat (e.g. woodland).
 - *Habitat connectivity*: This is particularly important for the less mobile species (e.g. most reptiles, ancient woodland flora), but most species are reluctant to cross large areas of unsuitable habitat. For most species a degree of habitat connectivity is essential to enable them to move through the landscape. Hedgerows, river corridors and roadside verges are all potential dispersal routes between blocks of suitable habitat. Isolated habitats are usually ecologically poorer than those with high levels of connectivity to other areas of semi-natural habitat.
 - *Geographic locality*: Many of the rarer species have very restricted geographical ranges, and are often reasonably sedentary, and this factor will have a significant effect on the number of species present at a site.
 - *Known Records*: The biological data search (carried out as part of the desktop study) will reveal any known records of protected or notable species within two kilometres of the site, however many species are under-recorded and the lack of records does not necessarily indicate a species is not present.
 - *Anecdotal records*: Local residents are often aware of the presence of species which are not known to official records centres. Although not always specific or verifiable, local knowledge should not be discounted when assessing a site and evaluating it's potential.
 - *Indicative evidence*: Certain species (e.g. badgers, bats) leave obvious and unambiguous evidence of their presence in the form of indications such as latrines, droppings, feeding remains or tracks. Other species which do not leave such indications may be visible during the site survey, depending on the timing of the survey (e.g. basking reptiles, breeding birds).
- 1.5 In any site assessment the combination of these and other factors is used to determine the potential for protected and notable species to be present on site.
- 1.6 Where initial surveys and assessments determine the Site has potential to support protected or notable species, Natural England, the Statutory Organisation for Nature Conservation (in England) recommend further surveys to determine the presence or likely absence of those species are carried out prior to the determination of planning permission. English Nature considers that in order for local authorities to make an informed decision, information as to the presence or likely absence of such species (as a minimum) is needed prior to the determination of planning permission. Individual local authorities may however require detailed impact assessments and mitigation programmes prior to the determination of planning permission, or they may include such measures as planning conditions.

Fig 1. Topographical survey, current layout.

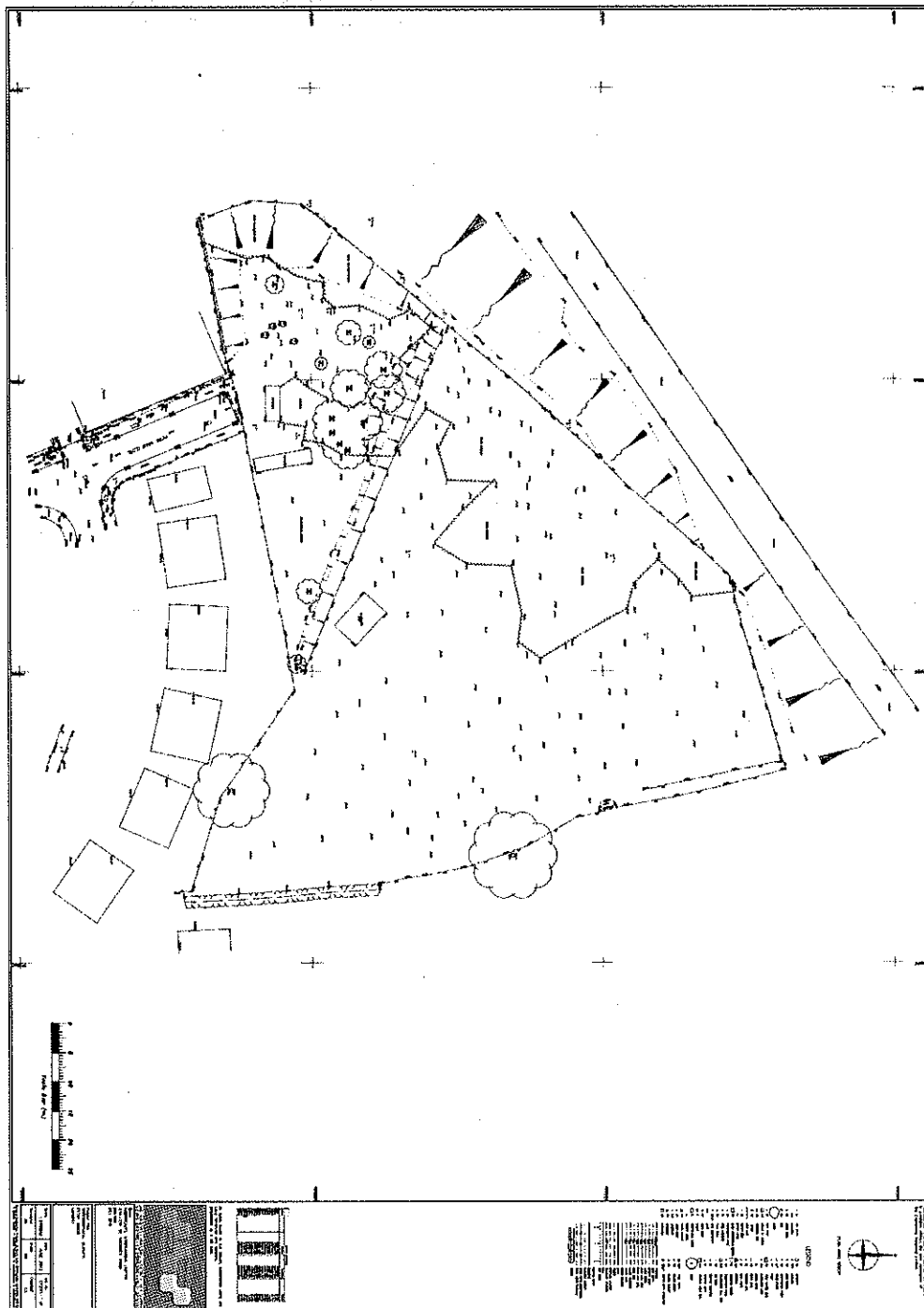


Fig 2. Aerial view of current site.

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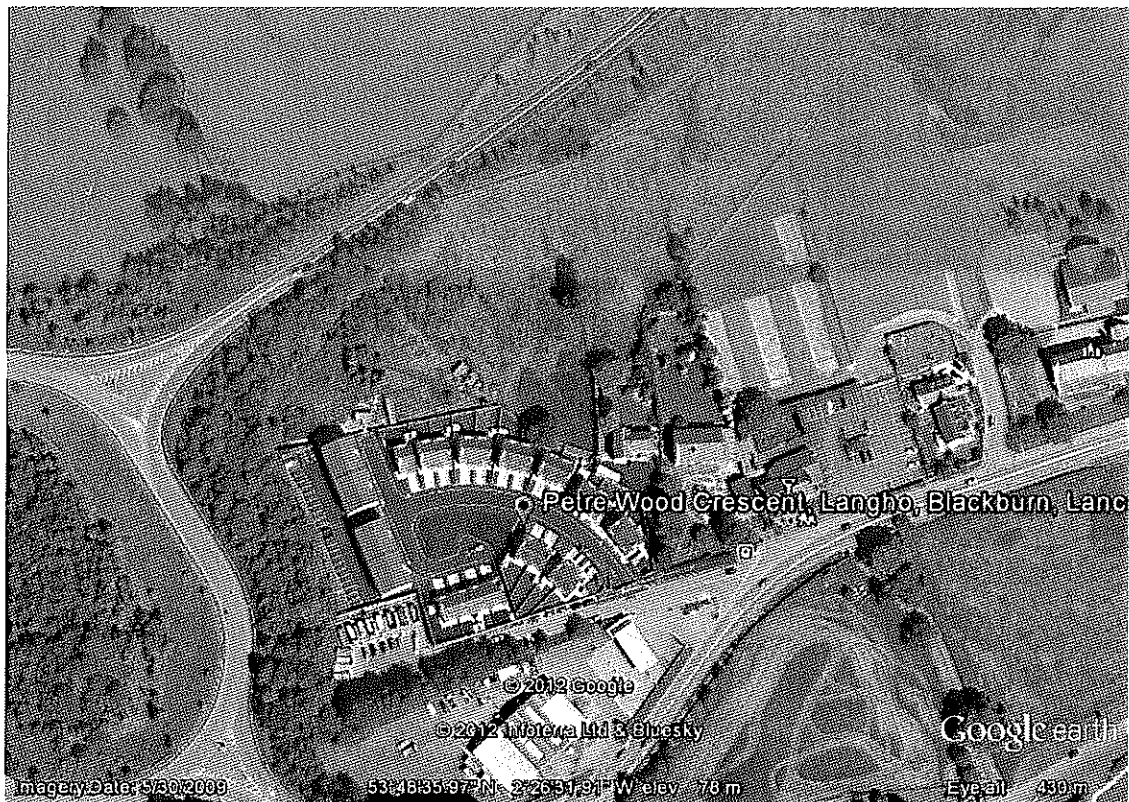
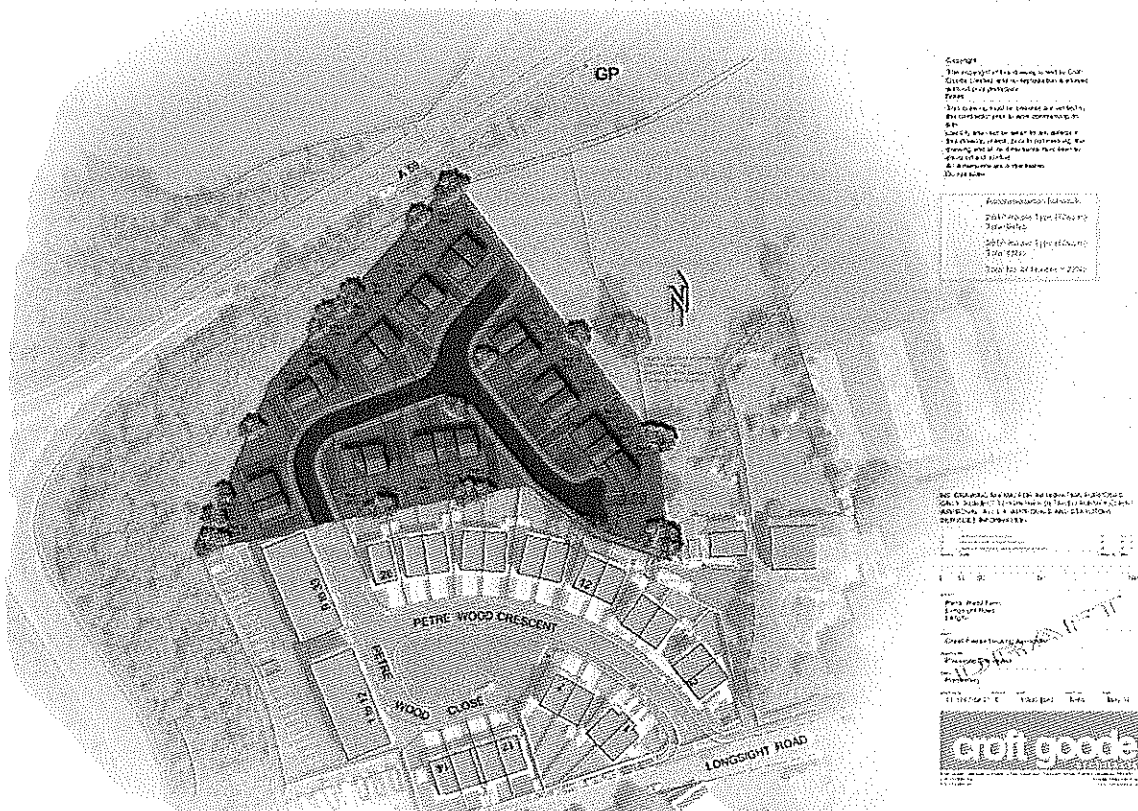


Fig3. Proposed layout.



2. METHODS

Desk Top Study

2.1 A number of organisations were used to ascertain the ecological history of the site.

- Nature on the map. www.natureonthemap.naturalengland.org.uk/
- Magic Interactive maps. <http://www.magic.gov.uk/website/magic/>
- Anecdotal evidence.

Field Surveys

2.2 Walkover Assessment - Landscape and habitats overview

2.2.1 All habitats within the Site were assessed for their potential to support rare, protected or notable species. The habitats within the Site were surveyed for indicative evidence of protected and notable species, and for suitable habitat to support species of amphibians and reptiles along with breeding birds. The degree of habitat connectivity was assessed both during the field survey and using Ordnance Survey maps and aerial photographs of the Site and surrounding area. Habitats which were considered to have potential to support protected and notable species were identified, and further surveys have been conducted and incorporated into this report where these habitats may be affected by the proposed re-modelling.

2.2.2 Only areas proposed for redevelopment and immediate surrounding areas were surveyed in full.

2.3 Badger Survey Daytime.

2.3.1 Dates. 17th July 2012.

2.3.2 Surveyors. Mr W Gaudie, BSc hon Wildlife Conservation, MIEEM. Mr J Ashworth, BSc Environmental Science.

2.3.3 Conditions. 16°C - 20°C, good visibility, occasional heavy rain

2.3.4 Area surveyed. Entire Site and whole boundary of proposed work was walked with extra attention put on any gaps in hedges, walls or fences likely to be used for entry.

2.3.5 Method. Site was searched for signs of badger latrines, footprints, desire lines, hairs, snuffle holes and scratch poles.

2.3.6 Equipment. Field books, magnifying glass, Cluson Smartlite 1,000,000 candlepower torch.

2.4 Badger Survey Night-time.

2.4.1 Date. 17th / 18th July 2012.

2.4.2 Surveyors. Mr W Gaudie, BSc hon Wildlife Conservation, MIEEM. Mr J Ashworth, BSc Environmental Science.

2.4.3 Conditions. 100% cloud cover, heavy showers, min temp 9°C.

2.4.4 Area surveyed. Perimeter of proposed works walked.

2.4.5 Method. Dawn to dusk watch.

2.4.6 Equipment. Meteos Skywatch weather station, Yukon NVMT.2.3x42 night vision.

2.5 3 x Bat dusk and dawn surveys.

2.5.1 Dates. July 2012.

2.5.2 Conditions. See Table 1.

2.5.3 Timings. Dusk Surveys 21:15 – 00:30hr (sunset 21:31 – 21:24), Dawn Surveys 03:03 – 05:20hr (sunrise 05:03 – 05:11)

2.5.3 Surveyors. Mr W Gaudie (Surveyor 1), BSc hon wildlife conservation, MIEEM. Natural England Licence No 20112113, Mr J Ashworth, BSc Environmental Science.

2.5.4 Areas surveyed. Perimeter of Site (see Fig 3 for transects of surveyors).

2.5.5 Method. As per; Bat Conservation Trust (2007). *Bat Surveys – Good Practice Guidelines*. Bat Conservation Trust, London. ISBN 976-1-872745-99-2.

2.5.6 Equipment. 2 x Ciel CDB 301 HD/FD bat detector, Garmin etrex GPS, Meteos Skywatch weather station, Yukon NVMT.2.3x42 night vision.

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Table 1. Condition at Land off Petre Wood Crescent, Langho

Survey	Date	Min Temperature	Wind	Cloud Cover	Rain
Dusk	180712	12°C		100%	Nil
Dawn	180712	10°C		50%	Nil
Dusk	190712	12°C		66%	Nil
Dawn	190712	14°C		50%	Nil
Dusk	200712	12°C		20%	Nil
Dawn	200712	15°C		10%	Nil

2.6 Night Time Owl Surveys.

2.6.1 Dates. As 2.5.

2.6.2 Conditions. See Table 1.

2.6.3 Timings. Immediately prior and during above bat surveys.

2.6.3 Surveyors. Mr W Gaudie (Surveyor 1), BSc hons wildlife conservation, MIEEM. Mr J Ashworth, BSc Environmental Science.

2.6.4 Areas surveyed. Perimeter of Site (see Fig 3 for transects of surveyors).

2.6.5 Method. Owl calls noted.

2.6.6 Equipment. Garmin etrex GPS, Meteos Skywatch weather station, Yukon NVMT.2.3x42 night vision.

Fig 4. Positions of surveyors for dawn and dusk surveys July 2012.



2.7 Reptile Habitat Survey.

2.7.1 Dates. 16.07.12 – 20.07.12.

2.7.2 Conditions. See table 2.

2.7.3 Surveyors. Mr W Gaudie, BSc hons Wildlife Conservation, MIEEM. Mr J Ashworth, BSc Environmental Science.

2.7.4 Method. Area of proposed development studied for signs of reptile presence and habitat suitability.

Table 2. Day weather conditions, Lango, 16.07.12 – 20.07.12

Date	Noon Temperature	Cloud Cover	Rain
16.07.12	17°C	80%	Heavy showers
17.07.12	15°C	100%	Heavy shower
18.07.12	15°C	50%	Scattered showers
19.07.12	16°C	20%	Light showers
20.07.12	18°C	10%	Dry

2.8 Butterfly Transects

2.8.1 Date. 20.07.12.

2.8.2 Conditions. Sunny, 18°C, good visibility, dry.

2.8.3 Surveyors. Mr W Gaudie, BSc hons Wildlife Conservation, MIEEM. Mr J Ashworth, BSc Environmental Science.

2.8.4 Method. 2x transects walked around site at 11am and 3pm. All species. Ad hoc recordings of other species noted during further presence on site.

2.8.5 Equipment. Field books, nets.

2.9 Bird Transects

2.9.1 Dates. 20.07.12.

2.9.2 Conditions. Sunny, 18°C, good visibility, dry.

2.9.3 Surveyors. Mr W Gaudie, BSc hons Wildlife Conservation, MIEEM. Mr J Ashworth, BSc Environmental Science.

2.9.4 Method. Conducted to B.T.O. recommendations (adapted for survey requirements). Ad hoc recordings of other species noted during presence on site. Areas of rough grass suitable for ground nesting birds searched in grid fashion.

2.9.5 Equipment. Field books, Vanguard SDT 10x42 roof prism binoculars.

2.10 Great Crested Newt Habitat Suitability Survey.

2.10.1 No ponds discovered within 500m of the site.

2.12 Habitat Survey (Flora). List of flora recorded in Table 4.

2.13 Limitations. Surveys conducted during 1 week only. Lists of flora do not claim to be a definitive species list.

3. RESULTS

3.1 Desk Top Study

3.1.1 Nature on the Map. An updated 1km search of reported; Protected Species, BAP Species and other notable species was searched for.

3.1.1.1 Protected Species. No Protected Species were recorded within 1km of the proposed development area.

3.1.2 Magic Interactive maps. <http://www.magic.gov.uk/website/magic/> The site is currently unclassified on the Magic Interactive maps.

3.1.3 Anecdotal evidence. No anecdotal evidence was forthcoming from members of the public or walkers whilst conducting surveys.

3.2 Field Surveys

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Landscape and habitats overview

- 3.2.1 The survey area comprised of the proposed areas of development as outlined in section 2.2.1
- 3.2.1.1 The area appears to consist of mainly marshy grassland, however due to the mosaic of habitats a definitive Phase 1 and/or NVC classification is difficult to confirm
- 3.2.1.2 Areas of sedge and reed persist in some places with patches of sphagnum (Area A Fig 5), whilst in other areas alder are starting to succeed over scrub grasses (Area B Fig 5).
- 3.2.1.3 Piles of spoil and rubble along with sheets of corrugated roofing and wood piles have created an opportunity for reptile and hedgehog refugia (Area C Fig 5).
- 3.2.1.4 A small group of Alder and Fir trees can be found in the south –west corner of the site. All trees are considered moderate quality (Area D Fig 5).
- 3.2.1.4 Two trees of note are found on site.
- Tree 1 a large mature oak positioned on southern boundary close to adjacent gardens. The tree is subject to TPO status and although showing signs of extensive damage to the base of trunk and rot, is still considered very important as it currently contains bat roosts.
 - Tree 2 a large sycamore positioned on the eastern boundary of the site. The tree is in good condition and should be protected during development.
 - See Fig 5 for positions of trees
- 3.2.1.5 The wooded areas to the west and north of the site contain maturing Ash, Willow, Alder and sycamore along with sporadic Hawthorn, Holly and Oak. In the wider aspect this woodland provides a good ecological corridor and should be protected during development (Area E Fig 5).
- 3.2.1.6 Appendix 1 for Site lay out and photographs.

3.3 Badger Survey Daytime.

- 3.3.1 No badger setts were discovered on or immediately bordering the development site. No signs of badger latrines, footprints, desire lines, hairs, snuffle holes or scratch poles were noted during search of site and boundary.

3.4 Badger Survey Night time.

- 3.4.1 No badgers were spotted on site during the night surveys.

3.5 Bat Surveys.

3.5.1 Bat Dusk and Dawn Surveys.

- 3.5.2 Common Pipistrelle were noted passing across the proposed development area during surveying (see fig 5). On each occasion bats flew west – east approximately 45 minutes after sun set and appeared to return approximately 90 minutes before dawn.

- 3.5.3 Noctule bats (*Nyctalus noctula*) were noted leaving the large Oak tree to the south of the development each evening immediately after sunset and appeared to forage over site for approx 1hr before moving east (fig 5).

Fig 5. Flight of Pipistrelle bats noted during dusk surveys August 2011.

Flight routes taken of Pipistrelle after dusk
 Flight routes taken of Pipistrelle prior to dusk
 Flight of Noctules.
 Noctule foraging area



3.6 Night Time Owl Survey

- 3.6.1 No Owls were noted flying over the site during the hours of surveying.

3.7 Reptile Surveys.

- 3.7.1 One female Grass snake was disturbed around noon on Thursday 19th July 2012 See Fig 6 for location.
 3.7.2 No signs of any other reptiles discovered.

Fig 6. Location of disturbed female Grass snake.



3.8 Butterfly transects.

3.8.1 A total of 6 species of butterfly were noted during transect walks See Table 3 for full breakdown.

3.10 Bird Transects.

3.10.1 A total of 18 species of bird were noted during transect walks See Table 3 for full breakdown.

3.11 Great Crested Newt Presence / Absence Survey

3.11.1 No suitable ponds for GCN were discovered during surveying.

3.12 Water Vole.

3.12.1 No suitable water-bodies were discovered during surveying.

3.13 Other Mammals.

3.13.1 1x fox spotted passing through hedge north of the site 19th July 2012.

3.13.2 Although not noted on site, the piles of wood and waste in the eastern area of the site provides idea refugia for hedgehogs.

Table 3. List of fauna noted during site visits.

Scientific Name	Common Name
Mammals	
<i>Erinaceus europaeus</i>	Hedgehog
<i>Pipistrellus pipistrellus</i>	Common Pipistrelle
<i>Nyctalis</i>	Noctule
<i>Vulpes vulpes</i>	Fox
Reptiles	
<i>Natrix natrix</i>	Grass Snake
Butterflies	
<i>Pararge aegeria</i>	Speckled Wood
<i>Maniola jurtina</i>	Meadow Brown
<i>Pieris brassicae</i>	Large White
<i>Artogeia rapae</i>	Small White

<i>Anthocharis cardamines</i>	Orange Tip
<i>Aglais urticae</i>	Small Tortoiseshell
Birds	
<i>Turdus merula</i>	Blackbird
<i>Motacilla alba subsp. yarrellii</i>	Pied Wagtail
<i>Columba palumbus</i>	Woodpigeon
<i>Garrulus glandarius</i>	Jay
<i>Certhia familiaris</i>	Treecreeper
<i>Erithacus rubecula</i>	Robin
<i>Sylvia atricapilla</i>	Blackcap
<i>Parus major</i>	Great Tit
<i>Phylloscopus collybita</i>	Chiffchaff
<i>Pica pica</i>	Magpie
<i>Parus caeruleus</i>	Blue Tit
<i>Streptopelia decaocto</i>	Collared Dove
<i>Dendrocopos major</i>	Great Spotted Woodpecker
<i>Turdus philomelos</i>	Song Thrush
<i>Buteo buteo</i>	Buzzard
<i>Troglodytes troglodytes</i>	Wren
<i>Passer montanus</i>	Tree Sparrow
<i>Prunella modularis</i>	Dunnock

Table 4. List of flora noted during site visits.

Scientific Name	Common Name
<i>Gallium aparine</i>	Cleavers
<i>Poa trivialis</i>	Rough Meadow Grass
<i>Prunus spinosa</i>	Blackthorn
<i>Rubus fruticosus</i> agg	Bramble
<i>Anthriscus sylvestris</i>	Cow Parsley
<i>Ranunculus repens</i>	Creeping Buttercup
<i>Hedera helix</i>	Ivy
<i>Arum maculatum</i>	Lords-and-Ladies
<i>Rosa canina</i>	Dog Rose
<i>Artemisia vulgaris</i>	Mugwort
<i>Rumex</i> sp	Dock
<i>Plantago major</i>	Greater Plantain
<i>Calystegia sepium</i>	Hedge Bindweed
<i>Geranium robertianum</i>	Herb Robert
<i>Lamium album</i>	White Dead-nettle
<i>Achillea millefolium</i>	Yarrow
<i>Rubus fruticosus</i>	Bramble
<i>Lolium perenne</i>	Perennial Rye-grass
<i>Trifolium repens</i>	White Clover
<i>Senecio jacobaea</i>	Ragwort
<i>Trifolium pratense</i>	Red Clover
<i>Plantago lanceolata</i>	Ribwort
<i>Chamaenerion angustifolium</i>	Great Hairy Willow-herb

<i>Prunella vulgaris</i>	Self-heal
<i>Veronica sp.</i>	Speedwell
<i>Urtica dioica</i>	Stinging Nettle
<i>Vicia sp.</i>	Vetch
<i>Convolvulus arvensis</i>	Bindweed
<i>Crataegus monogyna</i>	Hawthorn
<i>Quercus robur</i>	Pedunculate Oak
<i>Fraxinus excelsior</i>	Ash
<i>Alnus glutinosa</i>	Alder
<i>Acer pseudoplatanus</i>	Sycamore
<i>Fagus sylvatica</i>	Beech
<i>Betula pendula</i>	Silver Birch
<i>Rumex crispus</i>	Curled Dock
<i>Cirsium spp</i>	Thistle
<i>Ranunculus repens</i>	Creeping Buttercup
<i>Senecio jacobaea</i>	Ragwort
<i>Equisetum arvense</i>	Horsetail
<i>Knautia arvensis</i>	Scabius
<i>Veronica spp</i>	Speedwell
<i>Hydrocotyle vulgaris</i>	Pennywort
<i>Cardamine impatiens</i>	Bitter Cress
<i>Petasites hybridus</i>	Butter Bur
<i>Phalaris arundinacea</i>	Reed Grass
<i>Dryopteris filix-mas</i>	Male fern
<i>Phragmites spp</i>	Reed
<i>Carex spp</i>	Sedge
<i>Festuca spp</i>	Fescue
<i>Prunella vulgaris</i>	Selfheal
<i>Arrhenatherum elatius</i>	False Oat-grass

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4. MITIGATION.

4.1 Trees.

- 4.1.1 All trees that are to be retained will be protected to a minimum of their Root Protection Area ("RPA") by fencing to BS5837 standards during the period of development, so no top-soil stripping or heavy vehicles cause damage to roots of foliage.
- 4.1.2 The Oak on the southern boundary of site is mature, with plenty of fissures and bore holes. The tree supports bat roosts. The diameter of the tree at 1.5m above ground is approximately 900mm. Using BS5837 guidelines, a root protection area of at least 12 times this recommended (10.8m)
- 4.1.3 It is recommended that a full BS5837 tree survey is conducted to ascertain the level of all trees to be retained during development.

4.2 Breeding Birds

- 4.2.1 All tree works will be conducted outside of the breeding bird season unless a full breeding bird survey is conducted immediately prior to commencement of works by a suitably qualified ecologist.
- 4.2.2 Clearance of scrub will be conducted outside of the breeding bird season unless a full breeding bird survey is conducted immediately prior to commencement of works by a suitably qualified ecologist.

4.3 Bats

- 4.3.1 No works will be conducted on any mature trees unless a full bat roost survey has been conducted by a suitably qualified ecologist.

4.4 Badgers

4.4.1 None required.

4.5 Great Crested Newts

4.5.1 None required

4.6 Water Vole

4.6.1 None required.

4.7 Reptiles

4.7.1 To be reviewed once a full population survey has been conducted.

5. LOSSES

5.1 Reptile habitat

5.1.1 To be reviewed once a full population survey has been conducted.

5.2 Other habitat

5.2.1 A small area of scrub and areas of young Alder will be lost to the development.

6. COMPENSATION.

6.1 A planting and management regime plan should be agreed between the contractor and L.A. prior to the development taking place.

6.2 Natural England should be consulted once the findings of the Reptile Population Survey are known

7. SUMMARY

The area to be developed has good ecological value with an array of habitat types supporting a large and varied flora contingent. The proposal to construct 22 new homes would affect an area of predominantly wet grassland with areas of young Alder woodland, scrub and piles of rubble. A few mature trees on site would also require protection through any development. One of these trees (mature Oak) supports a roost of Noctule bats and any tree works associated with the development would require Natural England licencing.

The site also supports reptiles, with Grass Snakes present and may be used for breeding. Due to this discovery it recommended that prior to the start of any development a full population survey is conducted to assess if the site qualifies as a Key Reptile Site. It should be noted that even a small population will require mitigation under the Wildlife and Countryside Act 1981 (as amended).

No other protected species listed under the Wildlife and Countryside act 1981, schedule 1 (birds), schedule 5 (animals) and schedule 6 (plants) were discovered on land proposed for development. However; bat species were detected transecting the area. Adequate mitigation proposals to protect all wildlife and minimise disturbance will need to be adhered to.

Any changes in levels of the site should include mitigation measures to protect the mature trees on site and the wooded area to the north.

Depending on the findings of the recommended reptile population survey, any disturbance should be treated sensitively and adequately compensated for. Planning of the development should incorporate opportunities to improve the ecological value of the site in compliance with the National Planning Policy Framework (NPPF).



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www.ukbap.org.uk/lbap (accessed Apr/May 2010)
<http://www.magic.gov.uk/website/magic/> (accessed April 2010)
Lancashire Council Bio Records Beacon Hill Records Received April 2011

APPENDICES

- Appendix 1 Original Habitat Assessment conducted by Amphibian, Reptile & Mammal Conservation Ltd (2010).
- Appendix 2 Protected Species Search - Buckinghamshire & Milton Keynes Environmental Records Centre, April 2012
- Appendix 3 Magpie Wood Information - Buckinghamshire & Milton Keynes Environmental Records Centre, April 2012
- Appendix 4 Proposed Planting Layout and Work Areas. Drawing GGD 182 2106E (11th May 2011).
- Appendix 5 Site photographs.

APPENDIX 1 320130113P
Phase 1 habitat map

APPENDIX 2

9811681056 Photographs of Site

Fig A2.1 Looking south across Area A showing mature Oak tree containing bat roost



Fig A2.2 Damage to tree No 1



Fig A2. 3 Wet grassland, Area A



Fig A2. 4 Area A in foreground with Area B in background.



Fig A2. 5 Area D in background



Fig A2. 6 & 7, Rubble and wood piles Area C



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