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PHASE 1 HABITAT SURVEY AND PROTECTED SPECIES ASSESSMENT REPORT FOR LAND AT ELLESMERE LANE, PENLEY WREXHAM LL13 0LP

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1 EXECUTIVE SUMMARY

1.1 BACKGROUND

EVR Ecology was commissioned to undertake a protected species assessment and Phase One habitat survey on land on Ellesmere Lane, Penley, Wrexham. The site is approximately 2 hectares in size. There are no structures on site.

An inspection survey of land was carried out on 26th March 2014. It was inspected for evidence of the presence of and potential to support protected species. The site habitat was recorded as per the Handbook for Phase One Habitat Survey (JNCC, 1990).

1.2 RESULTS

Habitat

The ground area was improved grassland, heavily grazed and consisting of a monoculture of agricultural grass. There was no under-storey. There as an area at the SW corner, where the ground was heavily rutted and the grasses taller. There were occasional stands of *Senecio jacobaea* (ragwort), *Lamium purpureum* (red dead nettle), *Ranunculus ficaria* (lesser celandine) and *Cardamine spp* (bitter-cress). There was a substantial area of *Myosotis arvensis* (field forget-me-not), *Veronica agrestis* (green speedwell) and *Cardamine* (bitter-cress) along the north border.

The boundaries to the south and east are lined with shrubs and hedge species, mainly *Crataegus monogyna* (hawthorn) with some *Ilex aquifolium* (holly). The north and west have fence lines with some rough grass at the bases. The north is bordered by a farm track.

Protected species

- **Great crested newts (GCN):** There are 5 ponds within 256m. The closest (Ponds 1 and 2) scored excellent and good for GCN, Pond 5 scored excellent (256m) and Pond 4 (215m) average. Pond 1 was on the SW corner next to the site, Pond 2 at 90m to north.
- **Badgers:** Some digging and a push through the fence was found but no evidence that badgers were responsible. A mound of earth was found on the other side that could not be fully inspected. (see **Habitat Plan, Figure 1**).The closest suitable sett habitat was the woodland to the west. No signs of a sett were seen up to 30m in the woodland.
- **Bats:** A large oak at the west border had potential for use by bats, with a large hole in the east side of the trunk. Woodland to the west is good habitat for bats.
- **Nesting birds:** Bird activity was noted in the hedges to the south and east. No nesting behaviour was observed.

1.3 ASSESSMENT

Habitat

The habitat on the area of the proposed development site is of low diversity. The ground area was improved grassland that has been continually grazed over many years. The east and south boundary hedges (mainly hawthorn) are species poor. Only a small section of hedge will be removed on the south border to provide access for proposed development.

Protected species

GCN: Ponds close to the site have potential for GCN. If present in Ponds 1 and/or 2 GCN are likely to be moving across the site and may be foraging and taking refuge in field areas, particularly the rutted areas

Badgers: There is no definite evidence. The mound may be due to badger digging and possibly a sett entrance. If so the development would impact on badgers at this point. This requires fuller investigation.

Bats: The oak tree is directly on the border and new housing at the west side has potential for roosting. Impacts cannot be evaluated at this time. Further survey is required

Nesting birds: The hedges provide potential roosting sites. Potential for impacts on nesting must be accounted for.

Other protected species: there are no other protected species present or potential for them to be present.

1.4 IMPLICATIONS

Habitat

The stripping of the proposed areas will not result in any significant loss of habitat as the vegetation is of low diversity value. However, the boundary hedges have value as habitat for birds, invertebrates and small mammals. It is recommended these are retained as far as possible. The intended removal of a short section for access will have a low to negligible impact on habitat diversity. Any removal should be compensated for by equivalent planting of hedges on the site.

Protected species

Great crested newts (GCN):

There is potential for impact on GCN if they are present in Ponds 1, 2 and/or 5. These ponds are within and close to 250m from the site. The site is good for foraging and commuting, especially to the west side and along the south hedge line, and there is some refuge potential in the long grasses and rutted areas of the field for GCN. Potential impacts cannot be assessed on present data.

Bats:

There is potential for impact on bats that cannot be assessed at this time. The oak tree has potential and further survey is required to establish any use.

Badgers:

The mound at the south side of the south hedge requires investigation. If badgers have been digging at this point and there is a sett present then there is potential for the development to impact on badgers. This cannot be assessed on present evidence.

Nesting birds:

Nesting birds are very likely to be present on site and their possible presence will be mitigated for.

2 INTRODUCTION

2.1 SITE LOCATION AND DESCRIPTION

The site is 2 hectares (approximately) plot of land on Ellesmere Lane, Penley. Existing site plan with habitat mapping is given in **Figure 1, page 8**. The Ordnance Survey reference is SJ415394.

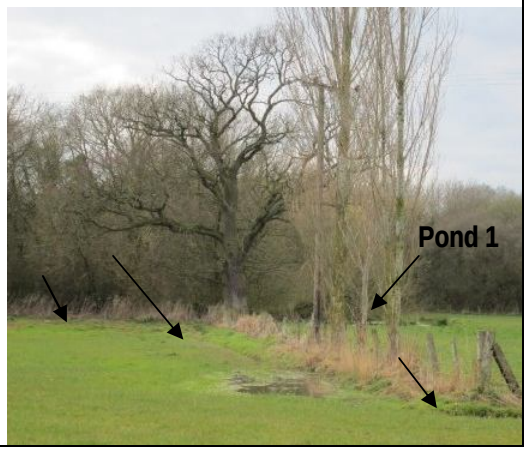
Site location

The site is south of the village of Penley, near Wrexham, LL13 0LP. The area is rural with open agricultural land to the east and north. There is housing to the south and a large tract of woodland at the west side. This has good connectivity to larger wooded areas to the south and SW.

Site habitat

The site was a domestic garden, which became disused over 5 years ago and has become overgrown. Site habitat is described below in **Table 1**.

Table 1: Land description

Description of area (areas given in Figure 1, page 8)	**photograph**
Main field area The site is flat and open. The habitat is improved grassland. The vegetation is a monoculture of field grasses, with most areas at a very short sward due to grazing There are occasional stands of dock, ragwort, bitter-cress and red dead nettle. The north boundary (indicated) is a fence line along the farm track, with longer grasses growing along the fence base.	
North field at boundary The field area along the north boundary fence has a substantial area of longer vegetation, dominated by *Myosotis arvensis* (green speedwell) and *Cardamine spp* (bitter-cress). There are 2 main patches at the NW side and along the central section of the fence-line. Here the grasses are longer and there is potential cover for GCN and other amphibians	
West area The ground in this area is heavily rutted and poached (indicated), and the depressions in the uneven ground were full of water during the survey visit. There are cracks and fissures in the ruts, which would provide good areas for GCN to use for refuge. The fence line has longer grasses along the base, connecting to the edge of Pond 1 (shown) and to the longer grasses in the rutted area in the west corner. The grasses in the rutted area shows only a year's growth with no understorey as yet developed.	

South and east boundary hedges The hedge is continuous and species poor, with *Cratageous monogyna* (hawthorn) dominant. Some *Ilex aquifolium* (holly) is present in patches. There is some long grass at the hedge bases, providing some potential cover for GCN, small mammals and invertebrates.	
Centre field and footpath The majority of the field area is short-cropped and there is a footpath running across the field from SE to NW. There are bare patches of earth particularly around the path.	

2.2 PROPOSED WORKS

The land is to be developed with 70 houses constructed on the site, with associated infrastructure and gardens.

2.3 AIMS OF STUDY

The surveys were conducted to find the status of the site in respect to protected species and to complete a Phase One habitat survey on the land area. It was to:

- establish the presence / absence of protected species on the site
- gather information to make an informed assessment as to the potential use of the site by protected species
- collect data to assess potential impacts on any species found on site and establish whether there may be a requirement for mitigation and compensation measures to be implemented to reduce the identified impacts of the development
- assess whether there may be a requirement for a licence for European protected species (EPSL) to be obtained to allow the development to proceed.

Guide to species ecology is given in **Appendix 1**.

2.4 PERSONNEL

Val Cooper is a professional consultant and bat specialist. She has over 15 years experience in surveying and conservation work on mammals and amphibians, and holds licences for surveying bats and great crested newts. She is experienced in preparing and delivering protected species licences. She has a BSc in Zoology/Psychology (Joint Honours) and MSc (with distinction) in Restoration Ecology. She has been a licensed bat worker and member of the Cheshire Bat Group since 1994. She works as a Voluntary Bat Warden for Natural England and participates in the annual National Bat Monitoring Programme of the Bat Conservation Trust. She is a full member of the Chartered Institute of Ecology and Environmental Management. She holds a bat class licence, number CLS998.

Dr Elizabeth Barratt is a mammal ecologist and bat specialist. She is a professional consultant with over 23 years experience in mammal conservation and survey work, specializing in bat ecology. She has been a licensed bat worker and member of the Cheshire Bat Group since 1986 and is a Voluntary Bat Warden for Natural England, participating in the annual National Bat Monitoring Programme of the Bat Conservation Trust. Dr Barratt is a full member of the Chartered Institute of Ecology and Environmental Management.

3 METHODOLOGY

3.1 FIELD SURVEY

3.1.1 Habitat on site/trees

A site walkover was carried out. Habitat areas were mapped and dominant species were recorded. Any unusual or rare species were noted. All trees marked for felling were checked for bat potential.

3.1.2 Great crested newts

Pond surveys

Available ponds were assessed as far as possible for suitability as habitat for great crested newts on the following criteria:

- size
- permanence of pond
- water quality
- percentage shade
- presence of wildfowl
- presence of fish
- pond density
- suitability and availability of terrestrial habitat
- abundance and type of emergent / submerged vegetation

Five water bodies were assessed.

An evening survey on Pond 1 and the field was undertaken. The field area and pond was inspected after dark with a high-power torch. Egg searches and netting were completed at all ponds apart from Pond 3.

Pond location, habitat and connectivity

Ponds had been located using an Ordnance Survey map and aerial photographs. Surrounding habitat was examined and the suitability and potential for use by great crested newts assessed. Distance and connectivity between proposed sites, ponds and to other ponds outside the 500m radius were assessed by maps and aerial photographs during the desk survey, and during the site visit. Potential dispersal routes were identified.

Identification of potential refuges, foraging areas on site

The areas of the proposed development plot were inspected for potential usage by great crested newts. The immediate areas around the proposed development sites were assessed for their suitability as GCN habitat and potential use of the whole site for commuting, foraging and land refuges. Refuge searches were made on a brick pile along the drive and in the wall areas close to the pond.

3.1.3 Bats

Habitat was evaluated for potential for use by bats for roosting, foraging and commuting.

3.1.4 Badgers

The land area was walked over and inspected for signs of badger use and occupation. These include:

- Presence of badger setts: evidence of holes at least 250mm diameter
- Activity in around any identified setts in the form of fresh dung piles, discarded bedding materials, badger hairs
- Evidence of commuting and foraging activity on the land: badger pathways, hair on any fences over potential paths, scrapes, uprooted areas of vegetation and so forth
- Areas of potential use by badgers, such as vegetated embankments.

3.1.5 Nesting birds

During the site walk over an inspection for signs of presence and potential for use by nesting birds was assessed.

4 RESULTS

4.1 FIELD SURVEY

4.1.1 Habitat on site/trees

The site habitat and species are mapped and tabulated in **Figure 1** and **Table 2** below. The site is improved grassland and is typical of disturbed and enriched land areas. No rare or unusual species were found.

The site boundaries to the north and west are fenced. The south and east hedge lines are dominated by *Cratageous monogyna* (hawthorn) and have only 3 woody species. They are intact and follow a continuous line around these aspects of the site. The understorey of the hedge was mainly grasses, with occasional *Urtica dioica* (stinging nettle), and some *Prunus fructicosus.*

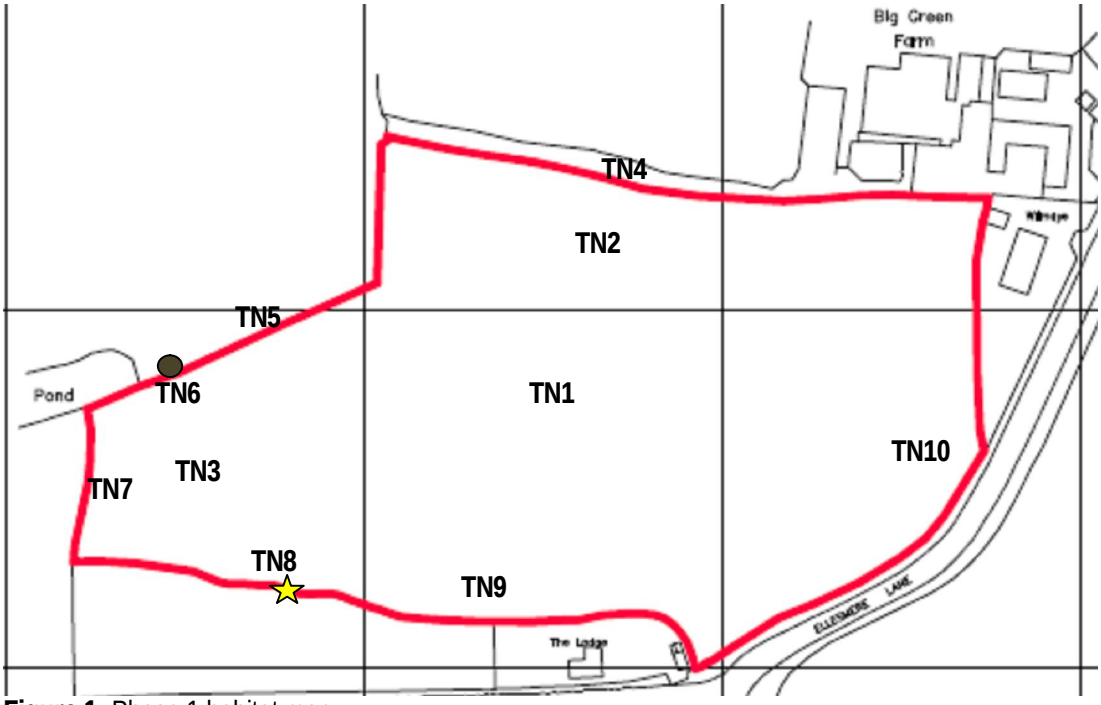


Figure 1: Phase 1 habitat map

Table 2: Target notes (TN) and Phase 1 codes (JNCC, 2003)

TN	Phase 1	Description	Notes
1	B4	Improved grassland, heavily grazed and at a short crop	
2	B4	Short perennial, with forget-me-not, green speedwell and bitter-cress, but still classified as grassland	Not short perennial in JNCC clasification
3	B4	Improved grass area, where rutting and lack of grazing has resulted in longer sward and boggy areas	
4	J2.4	Fence with some long grasses at base	
5	J2.4	Fence with some long grasses at base	
6	----	Single oak, of site, with holes in east side of trunk that have bat potential	Off site but beside edge of site
7	J2.3.2	Woodland edge with fence	
8	----	Breakthrough in hedge and mound of earth at far side – possible use by badgers ☆	
9	J2.1.2 J2.6	Species poor, intact hedge with dry ditch	
10	J2.1.2	Species poor hedge	

4.1.2 Protected species

GCN:

Pond surveys

All ponds were inspected and assessed under the Habitat Suitability Index criteria. Results are given in **Table 3**, **page 10**.

Pond 1 was a large water body (900m^2), directly adjacent to the NW side of the site. It showed signs of enrichment, with some filamentous algae below the surface, *Lemna minutae* over 50% of the surface and a large number of water fleas, sludgeworms and water hoglice found during the dipping. The habitat around the pond is very good on 2 sides, where it abuts the woodland to the west of the site.

- No amphibians were found during the dipping
- No newt eggs were found on the vegetation
- No GCN or any other amphibians were seen during the torch survey.

Figure 2: Pond 1 (directly beside site)

Figure 3: Pond 2

Pond 2 was a field pond with a maximum of 5% shading. Invertebrates found included mayfly nymphs, water beetles, Ramshorn snails, caddis fly larva (family: *Limnephilidae*), midge pupae and larvae. There was a great deal of macrophyte cover, including stands of *Epilobium* (willowherb) and *Myosotis scorpioides* (water forget-me-not), which are good egg-laying plants for GCN. There were also stands of *Glyceria*, soft rush (*Juncus effusus*), *Phragmites* and some *Typha*. The surface was heavily inundated with vegetation, but there was a clear area of water at the south side.

- No GCN or eggs were found during the netting and egg search
- The pond was not torched as the ground is too unsafe after dark.

Pond 3 was in poor condition. No macrophytes (aquatic vegetation) were present, the pond was 100% overshadowed and the base was contaminated with a heavy layer of leaf litter from the surrounding trees. No life was observed in the pond.

- No egg search could be done as there were no stands of vegetation present
- The poor condition of the pond indicates it is unsuitable for GCN so no further survey was undertaken.

Figure 4: Pond 3

Figure 5: Pond 4

Table 3: HSI scores and parameters for ponds at Ellesmere Lane site 26th March 2014

	Pond 1		**Pond 2**		**Pond 3**		**Pond 4**		**Pond 5**	
Feature	**Value**	**HS1 Score**	**Value**	**HS1 Score**	**Value**	**HS1 Score**	**Value**	**HS1 Score**	**Value**	**HSI score**
Geographical Area	A	1	A	1	A	1	A	1	A	1
Pond Area	900m^2	0.95	200m^2	0.4	200m^2	0.4	350m^2	0.6	800m^2	0.95
Permanence	perm	0.9	Dries occ	0.5	Dries often	0.1	Dries occ	0.5	perm	0.9
Water Quality Invertebrates (no. families)	Slight enriched 8	0.67	Possibly very slight enrichment 9	0.67	Poor Not dipped Lot of leaf litter	0.33	Poor. Lot of leaf litter 2	0.33	Slight enriched 8	0.67
Shade %	50%	1	5%	1	100%	0.2	90%	0.4	50%	1
Water Fowl	poss	0.67	poss	0.67	poss	0.67	poss	0.67	poss	0.67
Fish	no	1	no	1	no	1	no	1	no	1
Pond Count	>14	1	>14	1	>14	1	>14	1	>14	1
Terrestrial Habitat	moderate	0.67	moderate	0.67	moderate	0.67	moderate	0.67	moderate	0.67
Macrophyte Cover %	10	0.4	90	0.9	0	0.3	10	0.4	30	0.6
HSI value	**excellent**	**0.8**	**good**	**0.75**	**poor**	**0.45**	**average**	**0.61**	**excellent**	**0.83**

HSI Score Pond Suitability

< 0.5 Poor
0.5 – 0.59 Below average
0.6 – 0.69 Average
0.7 – 0.79 Good
> 0.8 Excellent

Pond 4 was heavily shaded. It had a lot of base leaf layer and the surface was covered with Lemna minutae apart from a small area on the east side. The water column had a lot of filamentous algae present. There were a few small stands of Iris at the water's edge. Water hoglouse and mosquito larvae were the invertebrates found. All indications were the water quality was poor.

- No GCN or amphibian larvae were found during the netting
- No eggs were found on the vegetation
- The pond was not torched due to deteriorating weather conditions (raining).

Pond 5 showed some signs of enrichment, with 50% over-shading and leaf litter on the pond base, Lemna across 50% of the surface. However, there was a bed of emergent vegetation at the south side and 8 families of invertebrates were found including mayfly nymphs, water beetles and phantom midge larvae. Indications are some enrichment, but better conditions than Ponds 3 and 4. The surrounding habitat was moderate, with woodland connecting this pond to Pond 1 beside the site.

- No eggs were found
- No GCN or other amphibians or larvae were found during the netting
- The pond was not torched due to deteriorating weather conditions (raining).

Figure 5: Pond 5

Torching and egg surveys

Ponds 1, 2 and 5 scored excellent and good for potential to support great crested newts (0.8, 0.75 and 0.83 respectively). No eggs were found on the vegetation around these ponds, or pond 4. There was no suitable vegetation at Pond 3.

Torching of Pond 1 found no amphibians present. Ponds 2 and 5 were not torched (see Constraints).

Pond location, habitat and connectivity

Ponds 1, 2 and 5 have the best connective lines to the site, directly along the hedges and woodland that run to the site from the pond locations. Pond 1 is located directly against the west boundary, next to the field area identified as having good potential for use by GCN due to the rutting, stands of longer grass around the ruts and along the fence, and pools of water in the ruts.

Ponds 3 and 4 have poor and average potential. Both have some connectivity to the site along hedges running to the north side, but are relatively distant.

The positions and distances indicate there is good potential for dispersal between Ponds 1, 2 and 5, and limited potential for dispersal to and from Ponds 3 and 4, particularly as these are in comparatively poor condition.

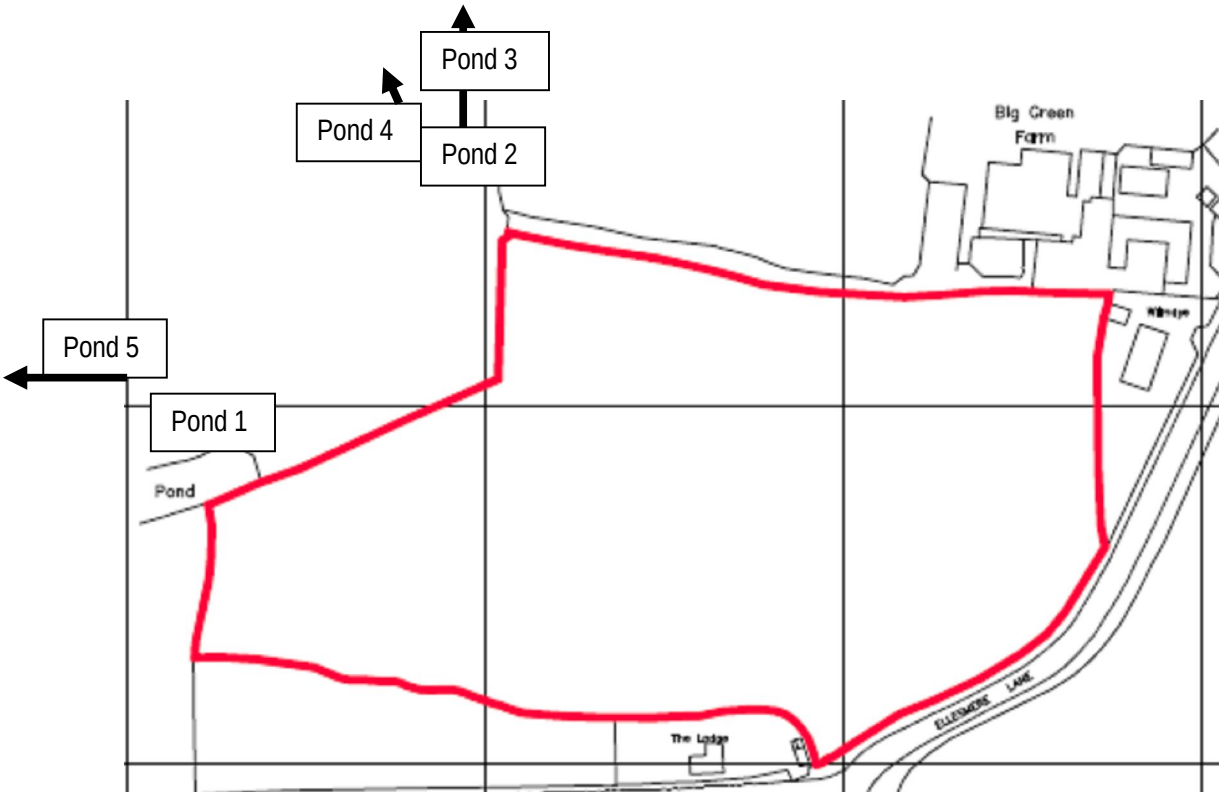


Figure 6: Positions of ponds

Table 4: Connectivity of ponds at Ellesmere Lane site

Pond 1	adjacent	Excellent connectivity to site and to hedge along south side of site
Pond 2	90m north	Good connectivity along the hedge running north from the end of the public footpath
Pond 3	209m north	Poorest connections, with only a circuitous route along the hedges. Good connections to Pond 4, which is 120m to the west of this pond.
Pond 4	215m NW	Some connection to site via hedges.
Pond 5	256m WNW	220m from Pond 1. Good connections via excellent GCN habitat (woodland) to the south of the pond

Identification of potential refuges, foraging areas on site

The open field area has no potential for use as a refuge by GCN. It has potential value as a foraging area, with bare patches of ground and some isolated stands of ruderal vegetation.

There is some potential for GCN to use the field as a commuting line, but any movements are more likely to be along the fence line between Ponds 2 and 5, or along the boundary hedges.

There are 7 areas identified that have potential for use as refuges by great crested newts. They are illustrated in **Figure 7** and listed below:

1) Long grasses and rutting, with pools of water and fissures, at the west boundary
2) Fence line at NW and west boundaries where the grasses are long and tussocks have developed
3) Large patch of short annual/perennial plants at north boundary

4) Woodland edge where there are long grasses and undergrowth very close to Pond 1
5) Hedge boundary with long grasses and some ruderal growth at base
6) Hedge boundary as above
7) The long grasses and tussocks along the fence line at the north boundary

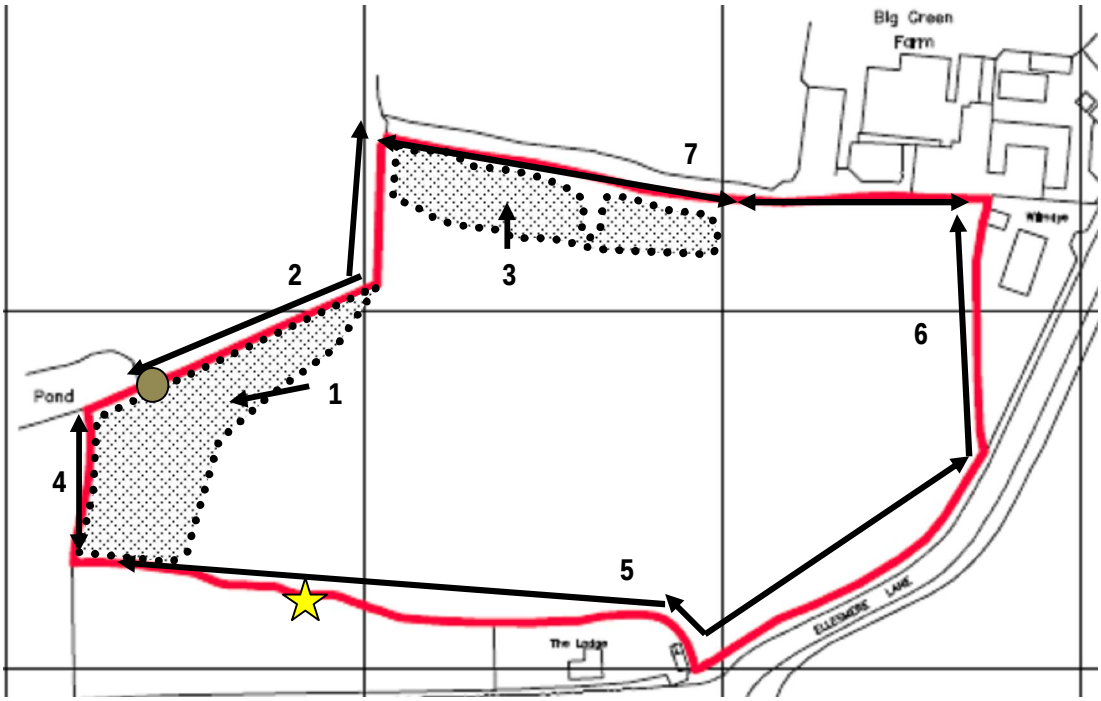


Figure 7: Potential refuge areas for GCN

Badgers: There were no sett holes found on the field or at the field margins. No dung pits or latrines were found. There was no evidence of tracks across the field that were made by badgers and no signs of digging on the field itself.

There was a breakthrough in the hedge at the south side (Figure 7 ☆) and a mound of earth on the ground behind. This could not be accesses for inspection.

There were no signs of a potential sett area within 30m around the boundary. This includes the woodland at the west, which was flat and easily inspected.

Bats: The oak tree ● at the west side has a hole at the east side, directed towards the field, which has potential for use by bats.

The boundary hedges and the woodland have good potential for foraging and commuting bats.

Nesting birds: No nesting behaviour was observed and no active nests found. There is potential in the boundary vegetation. Birds were active in the hedges and woodland.

Other protected species: There was no evidence indicating that other protected species present or potential for them to be present.

5 ASSESSMENT

5.1 CONSTRAINTS OF SURVEY

5.1.1 The ground behind the south boundary could not be accessed for inspection

5.1.2 The ground around Pond 2 was too uneven, boggy and waterlogged to safely access after dark to torch the open area of water.

5.1.3 Weather conditions (rain) prevented torch survey on Pond 5.

5.2 CONCLUSIONS

5.2.1 **Site habitat**

All areas on site are species poor. The assemblage and growth are indicative of highly disturbed sites, with common grasses, ruderal patches and occasional short perennial plants. The biodiversity value is low on the open areas, but the peripheral habitat and woodland at the edges of the site are good habitat for a diverse range of species. This is to be retained apart from a small loss in the south hedge for the access to the proposed development.

5.2.2 **Great crested newts**

Conclusions are

- Three of the 5 ponds in 250m have good potential to support great crested newts
- There is potential for great crested newts to forage and take refuge on the site
- There is some potential for GCN to cross the field
- If GCN are present in Ponds 1, 2 and/or 5, there is potential for them to be on site and for adverse impacts on the species due to the development
- At present there is insufficient information to assess these potential impacts.

5.2.3 **Bats**

There is some potential for bats to be using the oak tree at the west side as a roosting place
Present evidence is insufficient to establish potential impacts at this time.

The edge habitat to the west in particular is good for bats. Potential for disturbance to foraging bats will be considered.

5.2.4 **Badgers**

It is concluded that there are no badger sett holes on the land and no evidence that badgers are active on the site. The mound on the south may be a badger digging hole and if so, there could be potential impacts on badgers as a result of the development at the south side of the site. To assess that potential impact it will be necessary to establish what the pile is.

5.2.5 **Nesting birds**

There is potential for use of the edge habitats. No nests were seen but the density of the vegetation made it hard to inspect. Potential for use by wild birds for nesting will be mitigated for.

5.2.6 **Other protected species**

There is no evidence for the presence of protected species on the site.

5.3 POTENTIAL IMPACTS

5.3.1 Habitat

The habitat on the main site area is of low biodiversity value and species poor. It will not constitute a significant loss.

The site edges have greater value. The planned development is on the open area and there are no plans to impact on these areas. It is recommended that these are retained and if any loss is incurred it is restored through new planting.

5.3.2 Great crested newts

At present there is insufficient information to assess these potential impacts. It will be necessary to establish whether GCN are using Ponds 1, 2 and 5.

5.3.3 Bats

Potential impacts on roosting bats cannot be established on present evidence.
Developments adjacent to woodland and other areas that bats use for foraging can impact on bat behaviour if best practice measures are not observed. The woodland at the west has good potential and this must be accounted for in the mitigation. This will include best practice in lighting the new development at that side (**Appendix 3**).

5.3.4 Badgers

Potential impacts on badgers cannot be established on present evidence.
To assess any potential impact it will be necessary to establish what the pile is at the south boundary.

5.3.5 Nesting birds

There is some potential for impacts during work close to site boundaries if this is carried out in the nesting season of March to September. Potential for use by wild birds for nesting will be mitigated for.

5.3.6 Other protected species

There are no identified impacts at this time.

6 RECOMMENDATIONS AND MITIGATION

6.1 FURTHER SURVEY

6.1.1 Great crested newts

It will be necessary to establish whether GCN are present in Ponds 1, 2 and **5**. The survey season for GCN is March to June, with at least 2 survey sets being undertaken in the period mid-April to mid-May. Initially, 4 sets of survey visits are made to the pond and various protocols including trapping, netting and torch searching undertaken. If GCN are found to be present, then 2 further surveys will be completed, with a total of 6 visits undertaken to establish populations.

6.1.2 Bats

A minimum of 2 evening surveys will be required during the main active season of May to August to establish whether the oak tree is being use as a roost and to monitor edge activity at the west side.

6.1.3 Badgers

The digging at the south boundary will be investigated. Either access will be granted for inspection or information on what it is given by the occupants of the property.

6.1.4 Nesting birds

If any work is to be undertaken during the bird breeding season of March to September then mitigation measures will be required, which includes an initial edge survey for breeding birds and an ongoing monitoring of work at 4m and les to the west , south and east boundaries. If this is not possible, then a pre-start survey to identify any active nests and a watching brief must be kept during all operations within 4m of the boundary. If nesting birds are found or nesting behaviour observed work ceases in that area until the young have fledged.

6.1.5 **The conclusions and recommendations in this report in respect to surveys for protected species are based upon results from surveys in March 2014. These data will only be of use for 1-4 years (depending on species and circumstances) after which further survey to establish the position and possible changes in status will be necessary to ensure all activities are informed and guided by recent data on site status.**

6.2 REQUIREMENTS FOR EPS LICENSING

6.2.1 Protected species

No requirement for licensing is identified at this time. This will be reviewed following further survey work.

6.2.2 Caveat

No work must be done on the site prior to the completion of surveys and a final assessment undertaken. Failure to do so may result in an offence under the legislation for protected species (Appendix 2).

6.3 MITIGATION MEASURES

6.3.1 Great crested newts

Mitigation strategy will be required **if GCN are found** in any of the Ponds 1, 2 and 5. This will include application for a European Protected Species licence. Measures would include:

- Measures to exclude the GCN from the development site through a period of trapping
- Provision of areas to mitigate for the loss of foraging and refuge areas on the site
- Possible redesign of layout to ensure that any migration routes have not been damaged or lost by erection of insurmountable barriers, which would impact on potential future dispersal

- Working to best practice measures to minimise any potential impacts during and post development
- Post-development monitoring of the GCN population through surveys at specified ponds.

If no GCN are found in Ponds 1, 2 and 5 it is concluded that they are very unlikely to be on site and that no measures will be required. This is qualified by the caveats that

1. in all areas where there are ponds it is best practice to undertake works using reasonable avoidance measures (RAMS), to minimise risk of impacts should GCN be present and undetected. These are given in **Appendix 4**.
2. **if at any time during the development great crested newts are found, all work will stop immediately and advice taken from a licensed ecologist or Natural England as to how to proceed. This would include a review of the licensing position**.

6.3.2 **Bats, badgers**

Mitigation measures will depend on the results of surveys.

6.3.3 **Nesting birds**

The potential for nesting birds has been identified at the site. If work commences in the breeding season of March to September then a survey will be carried out for their presence along the boundaries.

All bird species and their nests are protected from destruction and disturbance in the breeding season. It is recommended that

- any landscaping and land clearance done near boundaries, unless carried out outside the nesting season of March to September, will be preceded by a pre-start survey for active nests.
- If no nests are found then work will go ahead, but a watching brief will be maintained over the nesting period to ensure that no active nests are disturbed during the works.
- **if nesting behaviour is observed (carrying nesting materials or food into hedges), then work should be suspended in 4m of that area and an ecologist contacted to assess the situation and advise.**
- **As a precaution all building material storage and contractor's compounds should be located at least 4m from a boundary, and any operations involving dust, vibration and noise also located away from boundary areas.**

6.3.4 **Other Protected species**

There are no mitigation measures required for any protected species at this time.

However if any protected species are found during any work being undertaken during the clearance and construction on the site then all work must stop and a qualified ecologist or natural England contacted for advice as to how to proceed. Failure to do so may result in an offence under the legislation detailed in Appendix 2.

6.3.5 **Conservation and enhancement measures**

A redevelopment provides opportunities to enhance a site for wildlife and is recommended on sites where there is potential for wildlife and site features that may be used as foraging areas and/or commuting pathways for bats and other species. It is therefore recommended:

- Where possible, the mature trees and hedgerows on around and near the site should be retained. These have potential to develop into natural roosting sites.
- **Removal of any large, mature trees should only be done following an inspection for potential roost holes for bats.**
- It is also recommended that insect attracting shrubs be incorporated into any future planting scheme to encourage the presence of insects and thereby provide suitable foraging sites for local bats which have been observed to use the site for foraging (see **Appendix 5**).
- The landscape should be managed where possible to maintain the small mammal populations and the insect population that is attracting bats. Shrub and less well-managed areas will create habitats to attract small mammals, birds and invertebrates

- Any external security and amenity lighting around the site should be designed to comply with Bat Conservation Trust Guidelines (Appendix 3). For example, low level lighting, short duration timing and sensitive orientation to point downwards and away from any potential roosting sites such as the trees.

Further information can be found in *Bat Mitigation Guidelines* (2004) available from Natural England.

7 REFERENCES

BCT (2007) *Bat Surveys Good Practice Guidelines* Bat Conservation Trust

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Langton, T.E.S., Beckett, C.L. and Foster, J.P. (2001) *Great Crested Newt Conservation Handbook* Froglife.

Natural England (2007) *Badgers and Development: A Guide to Best Practice and Licensing* Version 09/07

Oldham, R.S., Keeble J., Swan M.J.S and Jeffcote, M. (2000) *Evaluating the suitability of habitat for Great crested newts*. Herpetological Journal 10 143-155

8 APPENDICES

Appendix 1:	**Species ecology**
Appendix 2:	**Legislation and policy guidance**
Appendix 3:	**BCT lighting guidance**
Appendix 4:	**Reasonable Avoidance Measures (RAMS) for GCN**
Appendix 5:	**Habitat enhancement**