

# **Preliminary Ecological Appraisal, Land adjacent to White House Farm, Brinsop, Herefordshire, HR4 7AT**

Prepared on behalf of Mr Yorke-Brooks

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## Non technical summary

This report has been prepared by Sharpe Ecology, on behalf of Mr Yorke-Brooks. The report has been prepared to inform a planning application to develop a 0.6 acre field for holiday accommodation adjacent to White House Farm, Brinsop, Herefordshire, HR4 7AT.

An Extended Phase 1 Habitat Survey, pond great crested newt eDNA survey and desk study was carried out in June and July 2019. This report details the findings of the field surveys and desk study and provides an ecological baseline of the habitats and species present and an indication of the likely impacts of the proposals on protected or notable species, habitats and biodiversity. The report also sets out the need for further surveys; highlights areas of particular ecological interest; and identifies any ecological constraints. General recommendations for suitable mitigation are also provided.

The proposed development site comprised improved grassland, with non-native hedgerow, scrub and scattered trees around the field boundaries. A large pond is located 10m beyond the southeast corner of the field (located within the adjacent garden).

The hedgerow, trees and scrub offer potential nesting habitat for birds and foraging bats, while the scrub, trees and grassland provides suitable habitat for a range of common invertebrate species. The grassland was deemed to be unsuitable for reptiles and amphibians, and no great crested newts were detected within the adjacent pond. The native scrub forming the northwest field boundary was fragmented and deemed to be sub-optimal for supporting hazel dormouse. There were no signs of other mammals (badgers, polecat, pine marten, harvest mouse or hedgehog) on site and no impacts on these species are anticipated.

No further surveys are required.

Mitigation measures include:

- Vegetation removal outside bird nesting season, or prior check for nesting birds
- Sympathetic construction and post-construction lighting schemes to avoid light spill onto retained and adjacent habitats for bats
- The covering of, or use of mammal ramps within, any excavation, trenches or pits
- Cessation of works and appropriate course of action agreed in writing with ecologist if hazel dormouse, reptiles, great crested newt or hedgehog unexpectedly encountered during site clearance works.

Enhancement recommendations include:

- Nest bricks and bat boxes within new building
- Native and wildflower-rich planting for pollinators and other invertebrates

# **1. Introduction**

## **1.1. Purpose of report**

- 1.1.1. This report has been prepared by Sharpe Ecology, on behalf of Mr Yorke-Brooks. The report has been prepared to inform a planning application to develop a 0.6 acre field for holiday accommodation adjacent to White House Farm, Brinsop, Herefordshire, HR4 7AT.
- 1.1.2. An Extended Phase 1 Habitat Survey, pond great crested newt eDNA survey and desk study was carried out in June and July 2019. This report describes the findings of the desk study and field survey, describes the baseline ecological conditions of the site and provides an assessment of the likely impacts of the proposals on protected species and biodiversity. The report also sets out the need for further surveys and provides general recommendations for suitable ecological mitigation.
- 1.1.3. With reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Preliminary Ecological Appraisal 2017, the aims of this ecological appraisal are to:
- Identify any sites or features likely to be of conservation value within or close to the proposed development site;
  - Establish baseline conditions and identify any features, habitats or species which could potentially constrain the proposed development;
  - Provide an assessment of likely ecological impacts and set out mitigation measures;
  - Provide recommendations for enhancement in line with national, regional and local policies relevant to nature conservation and biodiversity;
  - Provide advice on measures to be taken in relation to designated sites and legally protected or otherwise notable species.
- 1.1.4. The survey and report follow the Chartered Institute for Ecology and Environmental Management's best practice guidelines for preliminary ecological appraisal (CIEEM 2017) and ecological impact assessment (CIEEM 2018) and relevant survey handbooks, best practice guidance and BS 42020:2013. The survey and report have been completed by a professional ecologist, who is a full member of the Chartered Institute for Ecology and Environmental Management.

## **2. Legislation and Planning Policy**

### **2.1. Local Planning Policy**

- 2.1.1. Policy LD2 (Biodiversity and geodiversity) within the Herefordshire Local Plan (formally adopted in October 2015) states:

Development proposals should conserve, restore and enhance the biodiversity and geodiversity assets of Herefordshire, through the:

1. retention and protection of nature conservation sites and habitats, and important species in accordance with their status as follows :
  - a) Development that is likely to harm sites and species of European Importance will not be permitted;
  - b) Development that would be liable to harm Sites of Special Scientific Interest or nationally protected species will only be permitted if the conservation status of their habitat or important physical features can be protected by conditions or other material considerations are sufficient to outweigh nature conservation considerations;
  - c) Development that would be liable to harm the nature conservation value of a site or species of local nature conservation interest will only be permitted if the importance of the development outweighs the local value of the site, habitat or physical feature that supports important species.
  - d) Development that will potentially reduce the coherence and effectiveness of the ecological network of sites will only be permitted where adequate compensatory measures are brought forward.
2. restoration and enhancement of existing biodiversity and geodiversity features on site and connectivity to wider ecological networks; and
3. creation of new biodiversity features and wildlife habitats.

- 2.1.2. Where appropriate the council will work with developers to agree a management strategy to ensure the protection, and prevention of adverse impacts on, biodiversity and geodiversity features.

### **2.2. National Planning Policy**

- 2.2.1. In accordance with the National Planning Policy Framework 2019, the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity where possible, and promote the preservation, restoration and re-creation of priority habitats and the protection and recovery of priority species populations and ecological networks.

- 2.2.2. When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- If significant harm resulting from a development cannot be avoided, adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

- Encouraging opportunities to incorporate biodiversity in and around developments;
- 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.

2.2.3. Additional advice set out in the National Planning Practice Guidance (2014) section 'Natural Environment' emphasizes the need for biodiversity to be taken into account when preparing a planning application, as detailed above, and sets out how biodiversity can be protected and enhanced by: seeking to include habitat restoration; re-creation and expansion; improved links between existing sites; buffering of existing important sites; new biodiversity features within a development; and securing management for long term enhancement.

## 2.3. Legislation

2.3.1. Certain habitats and species are subject to protection as laid out in the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017. The following are of particular relevance to this assessment:

- In England all species of bat and their breeding or resting places (roosts) are fully protected under the Conservation of Habitats and Species Regulations 2017 and Section 9 of the Wildlife and Countryside Act 1981 (as amended). This legislation makes it an offence to deliberately, intentionally or recklessly:
  - Kill, injure or capture a bat;
  - Obstruct access to any structure or place used for shelter or protection by bat;
  - Disturb a bat while it is occupying a structure or place which is used for that purpose;
  - Disturb bats in such a way it would affect the ability of any significant group of bat to survive, breed, rear or nurture or affect a local distribution or abundance;
  - Damage or destroy a breeding or resting place of a bat.
- In England great crested newts *Triturus cristatus* and their places of shelter are fully protected under the Conservation of Habitats and Species Regulations 2017 and Section 9 of the Wildlife and Countryside Act 1981 (as amended). This legislation makes it an offence to deliberately, intentionally or recklessly:
  - Kill, injure or capture a great crested newt;
  - Obstruct access to any structure or place used for shelter or protection by a great crested newt;
  - Disturb a great crested newt while it is occupying a structure or place which is used for that purpose;
  - Take or destroy the eggs of a great crested newt;
  - Possess or control any live or dead specimen or anything derived from a great crested newt.

- In England all birds, their nests and eggs are afforded protection under the Wildlife and Countryside Act 1981 (as amended) making it an offence to:
    - Intentionally kill, injure or take any wild bird;
    - Intentionally take, damage or destroy the nest of any wild bird while it is in use or being built;
    - Intentionally take or destroy the egg of any wild bird;
    - Certain birds are subject to further protection under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), making it an offence to intentionally, or recklessly, disturb any wild bird listed on this Schedule while it is nest building, or is at, or near, a nest with eggs or young, or disturb the dependant young of such a bird.
  - In England the hazel dormouse *Muscardinus avellanarius* is fully protected under the Conservation of Habitats and Species Regulations 2017 and Section 9 of the Wildlife and Countryside Act 1981 (as amended). This legislation makes it an offence to deliberately, intentionally or recklessly:
    - deliberately capture, injure or kill hazel dormice;
    - damage or destroy a dormouse resting place or breeding site;
    - deliberately or recklessly disturb a hazel dormouse while it's in a structure or place of shelter or protection;
    - block access to structures or places of shelter or protection;
    - possess, sell, control or transport live or dead hazel dormice, or parts of hazel dormice
- 2.3.2. In England, all native species of reptile are protected under the Wildlife and Countryside Act 1981 (as amended), making it an offence to intentionally kill or injure any species.
- 2.3.3. Badgers *Meles meles* are subject to protection as laid out the Protection of Badgers Act 1992. This legislation makes it an offence to wilfully kill, injure, take, possess or cruelly ill-treat a badgers, or attempt to do so, or intentionally or recklessly interfere with a sett, which includes damaging or destroying a sett, obstructing access to the entrance of a badger sett, and disturbing a badger whilst it is occupying a sett. Badgers are also given protection from killing or taking by certain means under Schedule 6 of the Wildlife and Countryside Act 1981 (as amended).
- 2.3.4. In addition, the Natural Environment and Rural Communities (NERC) Act 2006 places a duty on public bodies to consider enhancement of biodiversity within all their actions, and this Act also includes measures to protect species and habitat considered to be of Principal Importance that are highlighted as requiring particular conservation action by the UK Biodiversity Action Plan (UK BAP) and relevant Local Biodiversity Action Plans (LBAPs).

## 2.4. UK and Local Biodiversity Action Plans

- 2.4.1. The UK BAP and Herefordshire Biodiversity Action Plan identify a number of habitats and species as priorities for conservation. Those of particular relevance to this site are:
- Hazel dormouse

- Hedgehog

### 3. Methods

#### 3.1. Desk-based study

- 3.1.1. A desk-based study was undertaken in order to assist with the field survey and to establish the presence of protected sites and protected and notable species and habitats within a 2km radius of the site. Information on designated sites and species and habitat records were obtained from the Herefordshire Biological Records Centre.
- 3.1.2. The MAGIC website (<http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx>) which provides information covering rural, urban, coastal and marine environments across Great Britain was accessed for information on UK and European protected and important sites, habitats and species. The following features were searched for:
- Nature reserves and country parks;
  - Sites of Special Scientific Interest (SSSI's);
  - Internationally protected sites (e.g Ramsar, Special Protection Areas [SPA], Special Areas of Conservation [SAC])
  - Biodiversity Action Plan (BAP) Priority Habitats and Species.
- 3.1.3. The following sources were also reviewed:
- The Herefordshire Biodiversity Action Plan (<https://herefordshirewildlifelink.wordpress.com/biodiversity-action-plan/>).
  - Ordnance survey map for ponds or waterbodies within 500m of the site.

#### 3.2. Extended phase 1 habitat survey

- 3.2.1. The Extended Phase 1 Habitat Survey was carried out by Dr Fiona Sharpe MCIEEM, Consultant Ecologist, on 29<sup>th</sup> July 2019 and involved undertaking a detailed walkover across the proposed development site. Observations of flora and fauna were noted, in addition to an assessment of the potential habitats for protected species.
- 3.2.2. The Extended Phase 1 Habitat Survey was conducted in accordance with the guidelines set out in the Handbook for Phase 1 Habitat Survey (JNCC 2010). The extent of each habitat was mapped (Appendix A). Photographs (Appendix B) have been included to provide an indication of the nature conservation interest and a clearer picture of existing conditions.
- 3.2.3. Aerial photographs and Ordnance Survey maps were used to identify the location of any ponds within a 500m radius of the proposed development site.
- 3.2.4. The field survey was also conducted with respect to the information obtained from the desk study. From this it was identified that the following protected or notable species had potential to be present on site:
- Nesting birds
  - Bats
  - Reptiles



- Great crested newts
- Hazel dormouse
- Badgers
- Invertebrates

### 3.3. Great crested newt pond eDNA survey

- 3.3.1. A great crested newt eDNA pond survey of the pond 10m to the southeast of the site was carried out on 30<sup>th</sup> June by Fergus Henderson, who holds a current Natural England Class 2 survey licence for great crested newts (2016-20213-CLS-CLS). Water samples were collected from the pond in accordance with sample procedure set out by Natural England and SureScreen Scientifics and the eDNA testing was undertaken by SureScreen Scientifics
- 3.3.2. A second pond, identified on OS maps 170m west, was accessed but found to be dry.

### 3.4. Scheme impact assessment methodology

- 3.4.1. The Chartered Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment (CIEEM 2018) and Preliminary Ecological Appraisal (CIEEM 2017) are used as a basis to evaluate the nature conservation value of the site and features of ecological importance. These guidelines identify important ecological resources such as protected sites, species populations and habitats and attributes levels of importance at the following scales:
- International (in this case EU unless stated otherwise);
  - National (in this case within the UK or England, depending on legislative scope);
  - Regional (West Midlands);
  - County / local authority (Herefordshire);
  - Local (Brinsop/within the context of the site and the zone of influence);
- 3.4.2. In addition, habitats and species are evaluated in terms of Biodiversity Priority Habitats and Species as listed in the UK BAP and relevant Local BAPs.
- 3.4.3. Following collation of ecological baseline information, the likely impacts of the proposed development have been assessed based on the existing knowledge of the design and against the valuation criteria noted above and within relevant guidance notes.

### 3.5. Assumptions and Limitations

- 3.5.1. The optimum survey period for Extended Phase 1 Habitat Surveys in the south of England is generally late March/early April to mid-October, although this does vary according to habitats, e.g. woodlands are best surveyed in spring, grasslands in mid-summer and heathlands in autumn. Although surveys can be conducted throughout the year, some plant and animal species that might be present may not have been evident during the survey.
- 3.5.2. The baseline conditions presented in this report represent those at the time of survey and reporting. Variations in these conditions will take place as a result of seasonal factors, and over time.

## 4. Baseline Ecological Conditions

### 4.1. Statutory protected sites and other features

4.1.1. There is one statutory designated site within 2km of the site: Bishon Meadow SSSI, which is located 1.46km southwest and is designated for herb-rich neutral grassland, characterised by crested dog's-tail *Cynosurus cristatus* and common knapweed *Centaurea nigra*, a type which is now nationally restricted. Although the site falls within the SSSI Impact Risk Zone for this SSSI, due to the nature of the proposals and the distance between the site and the SSSI, no impacts on the notified features of the SSSI are anticipated and as such no further impact assessment is required.

4.1.2. There are seven non-statutory designated local wildlife sites (LWS) within a 2km radius of the site:

- Woods converging on Burton Hill SWS, which is located 1.9km north and is designated for a large area of mixed woodland extending from Burton Hill along three ridges. Parts of the woodland are ancient and generally the composition of the wood is very variable, including some conifer. Amongst the species present are oak, yew, birch and hazel with yellow archangel in the ground flora;
- Pool at Mansell Lacy Church SWS, which is located 1.85km northwest and is designated for pool with willow at the edge and waterbirds, including swan, tufted duck, moorhen and heron;
- Mansell Lacy Church SWS, which is located 1.55km northwest and is designated for a bat roost;
- Bishon Common SWS, which is located 1.46km southwest and is designated for wet unimproved pasture with a rich flora of uncommon species including cowslip, wild tulip and common restharrow;
- Merryhill Wood SWS, which is located 400m north and is designated for ancient woodland;
- Field near Whitehouse Farm SWS, which is located adjacent to the south east corner of the site and is designated for pond with a good margin of alder and willow; and
- Credenhill Park Wood and Sally Coppice SWS, which is located 635m east and is designated for ancient woodland.

4.1.3. Ordnance survey maps and aerial photographs revealed the presence of six waterbodies within 500m of the site, with two ponds within 250m of the site (10m southeast and 170m west).

### 4.2. Plants and habitats

#### *Desk study*

4.2.1. BAP priority habitats within 2km of the site include traditional orchard, deciduous woodland and ancient and semi-natural woodland.

4.2.2. A list of notable plant species recorded within 2km of the site is provided in Appendix C.

*Field survey*

- 4.2.3. The proposed development site comprised and improved grassland field (recently cut), with native scrub, trees, non-native hedgerow and fences forming the field boundaries. The site was bordered to the northeast by farm buildings and stables, to the southeast by a large arable field, to the southwest by a private garden and large pond and to the northwest by a minor road.

*Improved grassland*

- 4.2.4. The majority of the site comprised a small grass field consisting of improved grassland. The grassland had recently been cut and formed a uniform, short sward with no established leaf layer. The sward was dominated by grass species, with very few herb species present. Species present included false oat grass *Arrhenatherum elatius* (dominant), black bent *Agrostis gigantea*, perennial rye-grass *Lolium perenne* and Yorkshire fog *Holcus lanatus*, with occasional creeping buttercup *Ranunculus repens*, hogweed *Heracelum sphondylium*, creeping thistle *Cirsium arvense*, spear thistle *Cirsium vulgare*, dandelion *Taraxacum agg.*, broadleaved dock *Rumex obtusifolius* and nettle *Urtica dioica*.
- 4.2.5. The roadside verge (northwest boundary, just beyond the fenceline) comprised improved grassland with the same species as the field plus cocksfoot *Dactylis glomerata* and greater plantain *Plantago major*.

*Native scrub*

- 4.2.6. The northwest boundary comprised linear native scrub, with dense bramble *Rubus fruticosus*, interspersed with false oat-grass, barren brome *Bromus sterilis*, nettle and common hop *Humulus lupulus*, extending from the west corner (which also contained a small stand of English elm *Ulmus minor*, hawthorn and a plum tree *Prunus sp.*) to within 15m of the field gate, where it joined a 45m stretch of mixed native scrub comprising blackthorn *Prunus spinosa*, elder *Sambucus nigra*, hazel *Corylus avellana* and ivy *Hedera helix*.

*Scattered trees*

- 4.2.7. None of the trees along the site boundaries were within the redline boundary (all were on the other side of the fence line), with the exception of the small plum tree in the far west corner. Trees along the southwest boundary included white poplar *Populus alba*, poplar sp. *Populus sp.*, plum trees *Prunus sp.* (about 4-5 different varieties) and crack willow *Salix fragilis*. A line of poplars was located along the northeast boundary (northern end).

*Non-native hedge*

- 4.2.8. A maintained leylandii hedge was located along the northwest boundary (other side of the fenceline).

**4.3. Birds***Desk study*

- 4.3.1. Notable bird species recorded within 2km of the site and for which there are suitable habitats on or close to the site include bullfinch *Pyrrhula pyrrhula*, dunnoek *Prunus modularis*, skylark *Alauda arvensis*, linnet *Carduelis cannabina*, yellowhammer *Emberiza citrinella*, house sparrow *Passer domesticus* and song thrush *Turdus philomelos*.

*Field survey*

- 4.3.2. The woodland/scrub provides suitable nesting habitat for common birds. The following species were recorded on or close to the site during the Extended Phase 1 Habitat Survey:

- Wood pigeon *Columba palumbus*
- Swallow *Hirundo rustica*
- Blue tit *Cyanistes caeruleus*
- Blackcap *Sylvia atricapilla*

**4.4. Bats***Desk study*

- 4.4.1. Bat species recorded within 2km of the site include common pipistrelle *Pipistrellus pipistrellus*, lesser horseshoe bat *Rhinolophus hipposideros*, brown long-eared bat *Plecotus auritus*, Natterer's bat *Myotis nattereri* and noctule *Nyctalus noctula*.

*Field survey*

- 4.4.2. None of the trees on or adjacent to the site contained any features that could be used by bats (e.g. holes, cracks, crevices, split limbs or lifted bark). The boundary scrub and trees did provide suitable bat foraging habitat.

**4.5. Other mammals***Desk study*

- 4.5.1. [REDACTED] no records of badgers or setts on or adjacent to the site. There are also records of brown hare *Lepus europaeus*, otter *Lutra lutra*, pine marten *Martes martes* (single record dated 2012 from 1.7km north), polecat *Mustela putorius* (two records dated 1992 and 2012), hedgehog *Erinaceus europaeus* and hazel dormouse *Muscardinus avellanarius* (single record dated 1991, 1km to the north) from within a 2km radius of the site.

*Field survey*

- 4.5.2. No signs of badgers (footprints, well-worn pathways, dung pits etc) were noted within the site. No badger setts were noted on or adjacent to the proposed development site.
- 4.5.3. There were no signs of harvest mouse (nests, feeding remains), hedgehog, pine marten, polecat or brown hare on the site. No signs were noted of hazel dormouse (nests, feeding remains etc) however the bramble scrub along the northwest boundary was too dense to survey. The scrub along the northwest boundary was the only habitat suitable for hazel dormouse, but this habitat was fragmented and isolated (not forming part of a wider network of hedgerows/woodlands), was not connected to any suitable habitat at the north end, and was only connected to a further 30m stretch of scrub at the southern end.

## 4.6. Reptiles

### Desk study

- 4.6.1. There are no records for any reptile species within the 2km radius of the site.

### Field survey

- 4.6.2. The improved grassland did not provide suitable habitat for reptiles due to the managed nature of the grassland, the uniform, short sward and lack of any features that could be used by basking or sheltering reptiles. The base of the scrub along the northwest boundary provided limited opportunities for reptiles only, but again lacked any features that could be used by basking or sheltering reptiles. No reptiles or signs of reptiles were noted during the field survey.

## 4.7. Amphibians

### Desk study

- 4.7.1. There are records of *smooth newt Lissotriton vulgaris*, *common frog Rana temporaria*, *palmate newt Lissotriton helveticus*, *common toad Bufo bufo* and *great crested newt Triturus cristatus* within 2km of the site. The two records for great crested newt were dated 2005 and 2010 and were located 1.6km to the northeast and 1.3km to the southwest respectively. There were no records of great crested newts within 1km of the site.
- 4.7.2. Six ponds were located within 500m of the site, with two of these ponds located within 250m of the site (10m to the southeast and 170m to the west).

### Field survey

- 4.7.3. The improved grassland did not provide suitable habitat for amphibians due to the managed nature of the grassland, the uniform, short sward and lack of any features that could be used by sheltering amphibians. The base of the scrub along the northwest boundary provided limited opportunities for amphibians only, but again lacked any features that could be used by sheltering amphibians. No amphibians or signs of amphibians were noted during the field survey.

### Great crested newt pond eDNA survey

- 4.7.4. DNA from great crested newts was not detected in the pond located 10m to the southeast of the site and samples from the pond passed for the Sample Integrity Test, Degradation Test and Inhibition Test (please refer to attached Technical Reports dated 17/07/19, Appendix E). Therefore great crested newts are deemed to be absent from this pond.
- 4.7.5. The pond located 170m to the west was found to be dry, and therefore did not support great crested newts.

## 4.8. Invertebrates

### Desk study

- 4.8.1. A list of notable invertebrate species recorded within 2km of the site is provided in Appendix D.

*Field survey*

- 4.8.2. The grassland edges, roadside very and scrub supported a range of common invertebrate species only. None of the habitats were suitable for supporting notable invertebrate species.

## **5. Description of Proposals**

- 5.1.1. Details of the proposals are currently unknown but the proposals involve the development of the site to provide holiday accommodation.

## 6. Ecological Evaluation and Impact Assessment

### 6.1. Statutory protected sites and other features

- 6.1.1. Given the size and nature of the proposed development, no designated sites are considered likely to be significantly affected by the proposed development.
- 6.1.2. There will be no direct impacts on the adjacent Field near Whitehouse Farm SWS, and the scale of the development is unlikely to result in any significant indirect impacts. No other non-statutory designated sites are likely to be impacted by the proposals.

### 6.2. Plants and habitats

- 6.2.1. None of the habitats on site are not deemed to be rare or of ecological significance beyond a local level, and no notable plant species were recorded on the site. The small-scale loss of these habitats would not be significant in ecological terms other than for the species they may support (see below).

### 6.3. Birds

- 6.3.1. No notable bird species were recorded on or near the site. There is a risk of impacting nesting birds if any cutting back or removal of trees/scrub is required.

### 6.4. Bats

- 6.4.1. There are no bat roosts on or adjacent to the site. The scrub/tree boundaries do provide suitable habitat for foraging bats. There is potential to affect foraging bats through light disturbance from construction and/or post-construction lighting schemes. Any effects on bats are likely to be minor negative effects at the local level and can be mitigated through appropriate scheme design.

### 6.5. Other mammals

- 6.5.1. There were no setts on or within 30m of the site and there was no evidence of badgers using the site. Therefore, significant impacts on badgers are not anticipated.
- 6.5.2. No impacts on brown hare, pine marten, polecat or harvest mouse are anticipated and no further survey or specific mitigation is required.
- 6.5.3. There is a small risk of harm to hedgehog is encountered on site during vegetation clearance, although the risk of encountering hedgehog is only likely if the existing scrub habitat is to be affected.
- 6.5.4. Although the scrub along the northwest boundary does offer some suitable habitat for hazel dormouse, this habitat is isolated from any other suitable habitat. Given the lack of historical records for hazel dormouse within 1km of the site, and the isolated and small nature of the scrub habitat on/adjacent to the site, hazel dormouse is considered likely to be absent from the site and no significant impacts are anticipated.

### 6.6. Reptiles

- 6.6.1. There are no records of reptiles within 2km of the site, and the habitats on site are deemed to be of negligible / low value to reptiles; therefore the risk of encountering reptiles during site clearance works is deemed to be negligible, and no significant impacts on reptiles are anticipated.

## 6.7. Amphibians

- 6.7.1. The only pond holding water within 250m of the site does not support great crested newts and the habitats on site are deemed to be of negligible / low value to great crested newts. Using Natural England's risk assessment tool (Natural England 2013) and based on the assumption of between 0.5 – 1ha of habitat loss >250m from any potential breeding ponds, the risk of an offence occurring, in the absence of mitigation, is green (offence highly unlikely). Therefore significant impacts on great crested newts are not anticipated.

## 6.8. Invertebrates

- 6.8.1. The small-scale loss of improved grassland and scrub will not result in any significant impacts on invertebrates.

# 7. Mitigation, Compensation and Enhancement Measures

## 7.1. Statutory protected sites

- 7.1.1. There will be no significant effects on any statutory or non-statutory designated sites within 2km of the site; therefore no additional mitigation is required.

## 7.2. Plants and habitats

- 7.2.1. Habitat loss will be small-scale and not significant; therefore no specific mitigation is required.

## 7.3. Birds

- 7.3.1. To avoid the risk of disturbance to nesting birds, any removal / cutting back of the trees/scrub habitat should be undertaken outside of the peak bird nesting season (March to August inclusive) to avoid potential conflict with the legislation concerning breeding birds. If vegetation removal cannot be scheduled to avoid the bird nesting season then a check by an ecologist immediately prior to commencement of the works will be required, and if nests are found to be present, they must be adequately protected until breeding has finished and the nest is no longer in use.

## 7.4. Bats

- 7.4.1. There are no bat roosts on site. While the trees/scrub boundaries do provide suitable bat foraging habitat and could be used by bats, these habitats will be retained.
- 7.4.2. The risk of disturbance to foraging bats by new lighting should be mitigated through the design and implementation of sympathetic construction and post-construction lighting schemes to avoid all light spill on all existing boundary vegetation. This should be achieved through the design of an appropriate light scheme which:
- minimises lighting levels across the site;
  - minimises upward spill of light with the use of directional lighting (angled lighting at no greater than 70°) and low level dark skies to direct light to where it is needed and away from features of conservation value (e.g. through the use of low level bollard LED lighting);



- considers the timings of lighting required, where possible avoiding lighting in the hours immediately after dusk and before dawn when bats and other nocturnal mammals are most active;
- fitting of lighting with sensors to activate only when required; and
- uses narrow spectrum lights within no UV content and low pressure sodium and warm white LED lighting, not broad spectrum lights (particularly blue-white light) with high UV content, white LED, high pressure sodium, metal halide or mercury lighting.

7.4.3. Guidance on the design of lighting schemes in relation to bats can be found in 'Bats and Lighting: An overview of current evidence and mitigation guidance' (Stone 2013).

## 7.5. Other mammals

7.5.1. There will be no significant effects on other mammals; therefore no specific mitigation is required.

7.5.2. If hedgehog is unexpectedly encountered during site clearance works, it will be protected from harm, and if it does not disperse naturally, then an ecologist will be contacted and an appropriate form of action agreed.

7.5.3. If any hazel dormouse is unexpectedly encountered during site clearance works, all work will cease, and the hazel dormouse will be left in situ until an appropriate course of action has been agreed in writing with a licensed ecologist.

7.5.4. Measures to reduce or avoid any risk of harm or injury to any mammals crossing the site during construction works include the covering of excavation, trenches or pits or use of mammal ramps within any excavation, trenches or pits.

## 7.6. Reptiles

7.6.1. Reptiles are deemed to be absent from the site; therefore no mitigation is required. If any reptiles are unexpectedly encountered during site clearance works, all work will cease until an appropriate course of action has been agreed in writing with an experienced ecologist.

## 7.7. Amphibians

7.7.1. Great crested newts are deemed to be absent from the site; therefore no mitigation is required. If any great crested newts are unexpectedly encountered during site clearance works, all work will cease, and the newt will be left in situ until an appropriate course of action has been agreed in writing with a licensed ecologist.

## 7.8. Invertebrates

7.8.1. There will be no significant effects on invertebrates; therefore no specific mitigation is required.

## 7.9. Enhancement measures

7.9.1. Consideration should be given to the incorporation of 1-2 nest bricks and 1-2 bat boxes within the new building. Suitable nest bricks include Schwegler 1SP Sparrow Terrace, Manthorpe Swift Brick, Swift Block, Vivara Pro WoodStone House Sparrow Nest Box, Schwegler Brick Nest Box, WoodStone Build-in Swift Nest Box A or B, Vivara Pro Cambridge Brick Faced Swift Nest Box, and WoodStone Build-in Open Nest Box. Suitable bat boxes / bat tubes include Schwegler 1FF bat box, Beaumaris

Woodstone Bat Box, 2FE Schwegler Wall-mounted bat shelter, or Low Profile Woodstone Bat Box and suitable bat tubes include Build-in WoodStone Bat Box, 1FR Schwegler Bat Tube or Ibstock Enclosed Bat Box 'B'.

- 7.9.2. To enhance the site for invertebrates, native and wildflower species, providing pollen-rich flowers should be used within any new planting. Further advice on suitable planting can be found at <https://www.woodlandtrust.org.uk/blog/2019/03/wildflowers-for-bees/> and <https://www.rhs.org.uk/advice/pdfs/plants-for-bees.pdf>.

## 7.10. Summary of mitigation, compensation and enhancement measures

- 7.10.1. Table 1 summaries the general mitigation, compensation and enhancement measures required to ensure compliance with relevant wildlife legislation, to ensure no significant effects on species or biodiversity and to enhance the biodiversity value of the site and to provide opportunities to contribute towards local Biodiversity Action Plan targets.

Table 1 – Summary of further surveys and general mitigation and compensation measures

Ecological receptor	Mitigation measures	Compensation measures	Enhancement measures	Mechanism for securing delivery
Designated sites for nature conservation	None	None	None	n/a
Birds	Vegetation removal outside bird nesting season, or prior check for nesting birds.	None	Nest bricks within new building	Planning condition
Bats	Sympathetic construction and post-construction lighting schemes to avoid light spill onto adjacent habitats	None	Bat boxes within new building	Planning condition
Other mammals	The covering of or use of mammal ramps within any excavation trenches or pits.  Cessation of works and licensed ecologist to advise if hazel dormouse encountered during site clearance works  Ecologist to advise if hedgehogs encountered during site clearance works	None	None	Planning condition
Reptiles	Cessation of works and ecologist to advise if reptiles encountered during site clearance works	None	None	Planning condition
Amphibians	Cessation of works	None		Planning

	and licensed ecologist to advise if great crested newt encountered during site clearance works			condition
Invertebrates	None	None	Native and wildflower-rich planting	Planning condition

## References

CIEEM (2016). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2<sup>nd</sup> edition. Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM (2017). Guidelines for Preliminary Ecological Appraisal, 2<sup>nd</sup> edition. Chartered Institute of Ecology and Environmental Management, Winchester.

JNCC (2010). Handbook for Phase 1 habitat survey: A technique for environmental audit. Joint Nature Conservation Committee, Peterborough, UK.

Stone, E.L. (2013). Bats and lighting: Overview of current evidence and mitigation guidance. University of Bristol.

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## Appendix B Photographs



Image 1. Northwest boundary, looking northeast



Image 2. Southwest boundary, looking northwest





Image 3. Southeast boundary, looking northeast



Image 4. Northeast boundary, looking northwest





Image 5. Improved grassland field, looking southeast from site entrance



Image 6. Roadside verge



## Appendix C Notable plant species within 2km of the site

Common name	Latin name	Location (grid reference)	Date of record
Fine-leaved Water-dropwort	<i>Oenanthe aquatica</i>	SO433430	2014
Marsh Arrowgrass	<i>Triglochin palustre</i>	SO433430	2013
Sedge	<i>Carex acuta</i> x <i>elata</i> = <i>C. x proluxa</i>	SO433430	2013
Tubular Water-dropwort	<i>Oenanthe fistulosa</i>	SO433430	2013
Cowslip	<i>Primula veris</i>	SO44G	2012
Green-winged Orchid	<i>Orchis morio</i>	SO4278643706	2012
Small-leaved Lime	<i>Tilia cordata</i>	SO4444	2011
Small-leaved Lime	<i>Tilia cordata</i>	SO4544	2011
Sedge	<i>Carex acuta</i> x <i>elata</i> = <i>C. x proluxa</i>	SO433430	2010
Tubular Water-dropwort	<i>Oenanthe fistulosa</i>	SO433430	2010
Lesser Screw-moss	<i>Syntrichia virescens</i>	SO451436	2000
Floating Crystalwort	<i>Riccia fluitans</i>	SO4444	1999
Floating Crystalwort	<i>Riccia fluitans</i>	SO4444	1999
Floating Crystalwort	<i>Riccia fluitans</i>	SO4444	1999
Bluebell	<i>Hyacinthoides non-scripta</i>	SO44G	1997
Bluebell	<i>Hyacinthoides non-scripta</i>	SO44H	1997
Bluebell	<i>Hyacinthoides non-scripta</i>	SO44H	1997
Cowslip	<i>Primula veris</i>	SO44M	1997
Snowdrop	<i>Galanthus nivalis</i>	SO44G	1997
Snowdrop	<i>Galanthus nivalis</i>	SO44H	1997
Snowdrop	<i>Galanthus nivalis</i>	SO44H	1997
Stinking Chamomile	<i>Anthemis cotula</i>	SO44G	1996
Black Poplar	<i>Populus nigra</i> subsp. <i>betulifolia</i>	SO426454	1993
Black Poplar	<i>Populus nigra</i> subsp. <i>betulifolia</i>	SO427453	1993
Poplar	<i>Populus nigra</i>	SO426455	1993
Fan-Leaved Water-Crowfoot	<i>Ranunculus circinatus</i>	SO42714369	1991
Green-Winged Orchid	<i>Orchis morio</i>	SO42774356	1991
Mistletoe	<i>Viscum album</i>	SO44G	1991
Orange Foxtail	<i>Alopecurus aequalis</i>	SO42724371	1991
Orange Foxtail	<i>Alopecurus aequalis</i>	SO44G	1991
Spiny Restharrow	<i>Ononis spinosa</i>	SO42774356	1991
Mistletoe	<i>Viscum album</i>	SO44H	1990
Sun Spurge	<i>Euphorbia helioscopia</i>	SO44H	1990
Bluebell	<i>Hyacinthoides non-scripta</i>	SO4545	1989
Mistletoe	<i>Viscum album</i>	SO4545	1989
Wood Spurge	<i>Euphorbia amygdaloides</i>	SO4545	1989
Fan-Leaved Water-Crowfoot	<i>Ranunculus circinatus</i>	SO426437	1986
Tubular Water-Dropwort	<i>Oenanthe fistulosa</i>	SO426437	1986
Fine-Leaved Water-Dropwort	<i>Oenanthe aquatica</i>	SO44G	1980
Petty Spurge	<i>Euphorbia peplus</i>	SO44G	1980
Spiny Restharrow	<i>Ononis spinosa</i>	SO44G	1980
Thread-Leaved Water-Crowfoot	<i>Ranunculus trichophyllus</i>	SO44G	1980
Tubular Water-Dropwort	<i>Oenanthe fistulosa</i>	SO44G	1980
Spreading Bellflower	<i>Campanula patula</i>	SO4344	1889

## Appendix D Notable invertebrate species within 2km of the site

Common name	Latin name	Location (grid reference)	Date of record
Banded Demoiselle	<i>Calopteryx splendens</i>	SO43424299	2014
Black-tailed Skimmer	<i>Orthetrum cancellatum</i>	SO44G	2013
Agabus (Agabus) uliginosus	<i>Agabus (Agabus) uliginosus</i>	SO433430	2010
Dryops auriculatus	<i>Dryops (Dryops) auriculatus</i>	SO433430	2010
Enochrus nigrinus	<i>Enochrus nigrinus</i>	SO433430	2010
Beautiful Demoiselle	<i>Calopteryx virgo</i>	SO445429	2008
Rhyacophila septentrionis	<i>Rhyacophila fasciata</i>	SO445429	2008
Riolus subviolaceus	<i>Riolus subviolaceus</i>	SO445429	2008
Beautiful Demoiselle	<i>Calopteryx virgo</i>	SO445429	2007
Beautiful Demoiselle	<i>Calopteryx virgo</i>	SO445429	2007
Rhyacophila septentrionis	<i>Rhyacophila fasciata</i>	SO445429	2007
Riolus subviolaceus	<i>Riolus subviolaceus</i>	SO445429	2007
Riolus subviolaceus	<i>Riolus subviolaceus</i>	SO445429	2007
Helophorus strigifrons	<i>Helophorus (Helophorus) strigifrons</i>	SO449446	2005
Silver-washed Fritillary	<i>Argynnis paphia</i>	SO454441	2003
Black-Tailed Skimmer	<i>Orthetrum cancellatum</i>	SO4444	1998
Black-Tailed Skimmer	<i>Orthetrum cancellatum</i>	SO4444	1996
Tetanocera phyllophora	<i>Tetanocera phyllophora</i>	SO427437	1993
Brown Hawker	<i>Aeshna grandis</i>	SO426437	1986
Dorcatoma flavicornis	<i>Dorcatoma flavicornis</i>	SO4443	1913
Purple Emperor	<i>Apatura iris</i>	SO4444	1850

## Appendix E GCN eDNA Technical Report



Folio No: E6007  
 Report No: 1  
 Order No: P0040719  
 Client: SHARPE ECOLOGY  
 Contact: Fiona Sharpe  
 Contact Details: fiona@sharpeecology.co.uk  
 Date: 17/07/2019

### TECHNICAL REPORT

#### ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS

**Date sample received at Laboratory:** 05/07/2019  
**Date Reported:** 17/07/2019  
**Matters Affecting Results:** None

#### RESULTS

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
4462	The white house	SO 43865 44667	Pass	Pass	Pass	Negative	0

#### SUMMARY

When Great Crested Newts (GCN); *Triturus cristatus* inhabit a pond, they deposit traces of their DNA in the water as evidence of their presence. By sampling the water, we can analyse these small environmental DNA (eDNA) traces to confirm GCN habitation, or establish GCN absence.

The water samples detailed below were submitted for eDNA analysis to the protocol stated in DEFRA WC1067 (Latest Amendments). Details on the sample submission form were used as the unique sample identity.

#### RESULTS INTERPRETATION

**Lab Sample No.-** When a kit is made it is given a unique sample number. When the pond samples have been taken and the kit has been received back in to the laboratory, this sample number is tracked throughout the laboratory.

**Site Name-** Information on the pond.

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O/S Reference - Location/co-ordinates of pond.

**SIC- Sample Integrity Check.** Refers to quality of packaging, absence of tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to results errors. Inspection upon receipt of sample at the laboratory. To check if the Sample is of adequate integrity when received. Pass or Fail.

**DC- Degradation Check.** Analysis of the spiked DNA marker to see if there has been degradation of the kit since made in the laboratory to sampling to analysis. Pass or Fail.

**IC- Inhibition Check-** PCR inhibitors can cause false results. Inhibitors are analysed to check the quality of the result. Every effort is made to clean the sample pre-analysis however some inhibitors cannot be extracted. An unacceptable inhibition check will cause an indeterminate sample and must be sampled again.

**Result- NEGATIVE** means that GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as no evidence of GCN presence. **POSITIVE** means that GCN eDNA was found at or above the threshold level and the presence of GCN at this location at the time of sampling or in the recent past is confirmed. Positive or Negative.

**Positive Replicates-** To generate the results all of the tubes from each pond are combined to produce one eDNA extract. Then twelve separate analyses are undertaken. If one or more of these analyses are positive the pond is declared positive for the presence of GCN. It may be assumed that small fractions of positive analyses suggest low level presence but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive.

## METHODOLOGY

The laboratory testing adheres to strict guidelines laid down in WC1067 Analytical and Methodological Development for Improved Surveillance of The Great Crested Newt, Version 1.1

The analysis is conducted in two phases. The sample first goes through an extraction process where all six tubes are pooled together to acquire as much eDNA as possible. The pooled sample is then tested via real time PCR (also called q-PCR). This process amplifies select part of DNA allowing it to be detected and measured in 'real time' as the analytical process develops. qPCR combines PCR amplification and detection into a single step. This eliminates the need to detect products using gel electrophoresis. With qPCR, fluorescent dyes specific to the target sequence are used to label PCR products during thermal cycling. The accumulation of fluorescent signals during the exponential phase of the reaction is measured for fast and objective data analysis. The point at which amplification begins (the Ct value) is an indicator of the quality of the sample. True positive controls, negatives and blanks as well as spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared so they act as additional quality control measures.

The primers used in this process are specific to a part of mitochondrial DNA only found in GCN ensuring no DNA from other species present in the water is amplified. The unique sequence appropriate for GCN analysis is quoted in DEFRA WC 1067 and means there should be no detection of closely related species. We have tested our system exhaustively to ensure this is the case in our laboratory. We can offer eDNA analysis for most other species including other newts.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. Kits are manufactured by SureScreen Scientifics to strict quality procedures in a separate building and with separate staff, adopting best practice from WC1067 and WC1067 Appendix 5. Kits contain a 'spiked' DNA marker used as a quality control tracer (SureScreen patent pending) to ensure any DNA contained in the sampled water has not deteriorated in transit. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd also participate in Natural England's proficiency testing scheme and we also carry out inter-laboratory

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checks on accuracy of results as part of our quality procedures.

**Reported by: Sarah Evans**

**Approved by: Chris Troth**

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**End Of Report**

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