Great Crested Newt eDNA

Site Location: "The Stone House"

Malthouse Road, Alton, Staffordshire.

Author: Matthew James Haydock

Date: May 2019

Notice to Readers

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The results of the survey and assessment work undertaken by Absolute Ecology are representative at the time of surveying.

Every endeavour has been made to identify the presence of protected species on site, where this falls within the agreed scope of works.

The flora and fauna detailed within this report are those noted during the field survey and from anecdotal evidence. It should not be viewed as a complete list of flora and fauna species that may frequent or exist on site at other times of the year.

Up to date standard methodologies have been used, which are accepted by Natural England and other statutory conservation bodies. No responsibility will be accepted where these methodologies fail to identify all species on-site.

Absolute Ecology cannot take responsibility where Government, national bodies or industry subsequently modify standards.

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Reference to sections or particular paragraphs of this document taken out of context may lead to misrepresentation.

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1. Introduction

1.1. Site Description

Absolute Ecology was commissioned to carry out eDNA of a single pond at land known as Stone House Malthouse Road Alton, Staffordshire ST10 4AG [Grid ref: SK071423]. in order to obtain sufficient information to ascertain if great crested newts are present or absent.

This report is a follow-up from a Preliminary Ecological Appraisal August 10th, 2016. The pond on site is considered average value for GCN therefore eDNA sampling was conducted to identify the presence or absence.

During the site survey no access constraints were identified, and all surveys were done at the appropriate time of year according to the Natural England Mitigation Guidelines 2001.

The proposed development considers ca. an acre of garden lawn area to the side and rear of the grade II listed building “The Stone House” in the village of Alton, Staffordshire. The site is abutted by Malthouse road and residential buildings to the east and south, with a woodland belt embankment encompassing the north and western boundaries. The gardens contain a mix of ornamental non-native and native shrubs, with a number of mature/semi mature fruit trees scattered around selected borders.

A single ornamental pond is located in the NW compartment with allotment areas located on the central plateau. The grassland area gently slopes down from east to west and was seen to be well maintained and dominated by a low, homogenous sward of perennial ryegrass forming amenity lawn areas. A number of curtilage buildings, mature yew trees, hedgerows, stone walls and additional lawn areas can also be found within the gross land holding of “Stone House”.



Figure 1: Arial photo showing the site location by the red pin: Grid Ref: SK071423

1.2. Proposed Works

A planning application will be made for residential dwelling.

1.3. Best Practice Guidance

The scope of this appraisal has been determined in line with the proportional approach to ecological survey, assessment and subsequent recommendations for avoidance and mitigation of impacts, which is encouraged in the emerging 'BS 42020: Biodiversity – Code of practice for planning and development'. This report has been prepared with du consideration for various best-practice guidance and methodologies including those of the Chartered Institute of Ecology and Environmental Management (CIEEM (2012)1 and the emerging BS 42020.

1.4. Aims of the Survey

The aims of the Habitat Suitability Index and presence/absence surveys is to provide an ecological evaluation of the following species within the proposed application area.

Table 1. Aims of survey in relation to great crested newts

Great Crested Newts Habitat Suitability Index
• To establish which water bodies provide suitable conditions for great crested newts.
• Whether further surveys are required.
• Impacts of the proposed development.
Great Crested Newts Presence or Absence
• To establish presence/absence of great crested newts.
• If great crested newt presence is confirmed, to determine population size and distribution.
• Provide sufficient information for the evaluation of the perceived impacts of potential development and for the development of a detailed mitigation strategy to ensure legal compliance.

Assessment also considers the potential effects on valued ecological receptors (VERs) and zones of influence (ZoI) during pre and post development, both on site and off site. The term Zone of Influence is used to describe the geographic extent of the potential impacts of a proposed development. Should a likely significance of negative impacts be identified, further surveys and mitigation and enhancement measures will then be determined accordingly to prevent, offset or reduce the degree of impact that may occur should development commence.

Should great crested newts be present on site or within 500m, then a European Protected Species (EPS) development licence issued by Natural England (NE) may be required prior to any works taking place. If required, further presence/absence surveys should be undertaken and a mitigation strategy be implemented with Natural England and the Local Planning Authority. Should no further surveying effort be considered, then the PEA report will include full justification and evaluation.

2. Methods

2.1. Summary of Survey Methods

Great Crested Newt eDNA

The following methodologies were used:

eDNA: As outlined above eDNA surveys were undertaken for the one affected waterbodies. This new survey methodology is approved by Natural England;

'Defra has recently published the results of an investigation into the use of environmental DNA (eDNA) to detect the presence of Great crested newt (GCN) in water bodies together with a technical advice note setting out the field and laboratory methodology Defra Science and Research Project WC1067. On the basis of this study we will now accept eDNA test results as evidence of presence or absence of GCN for licence applications.'4

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

SureScreen Scientifics Ltd also participate in Natural England's proficiency testing scheme and we also carry out inter-laboratory checks on accuracy of results as part of our quality procedures.

eDNA Protocol

In accordance with the specified methodology,5 the field surveys followed a strict protocol to prevent contamination of the samples; this entailed:

1. Gloves were worn at all times during the sampling process, and gloves were replaced between sample collection from the waterbody and pipetting into the sterile sub-sample tubes.
2. Samples were collected without entering the water, i.e. the surveyor stood only on the waterbody bank or muddy waterbody edges. This prevented disturbance of the substrate to limit cross-contamination.

The field sampling protocol consisted of the following steps:

3. 20 samples were taken from single waterbody. The location of sub-samples were spaced as evenly as possible around the waterbody margin. Subsamples generally targeted areas with potential egg laying substrate (e.g. vegetation) and open water areas which newts may be using for displaying. Prior to sampling the water column was mixed by gently using a ladle to stir through the entire water column, whilst avoiding disturbing the sediment on the bed of the waterbody. Sampling of very shallow water was avoided where possible (less than 5-10 cm deep).

4. Once 20 samples had been taken, the sample bag was closed securely and shaken for 10 seconds. This mixed any DNA across the whole water sample.

5. A new pair of gloves were put on to keep the next stage as uncontaminated as possible.

6. Using a clear plastic pipette c15mL of water was taken from the bag and pipetted into a sterile tube containing 35mL of ethanol to preserve the eDNA sample (i.e. the tube was filled to the 50 mL mark).

7. The tube was shaken vigorously for 10 seconds to mix the sample and preservative. This is essential to prevent DNA degradation and was also repeated for each of the six conical tubes. Before taking each sample, the water in the bag was shaken to homogenise the sample, as DNA material constantly sinks to the bottom.

8. The box of preserved sub-samples was then returned at ambient temperature immediately for analysis by Sure Screen.

The samples were then returned to the laboratory (Sure Screen) for the eDNA analysis to be completed.

2.2. Pre-Survey Data Search

Ecological data searches supplied by Staffordshire Ecological Record Centre (SERC) were acquired to establish whether any great crested newts have been recorded within a 2 km radius of the proposed development area. Furthermore, a desktop study of the area using online resources was undertaken independently to corroborate the current overview of the site and its importance in the landscape. A number of electronic sources were consulted, including www.magic.gov.uk, www.naturalengland.org.uk and Google Earth.

2.3. Surveyor Information

Surveyor 1

Matthew Haydock – HND, ND, CMIEEM, Natural England Class 1 Licence: 2015-19150-CLS-CLS. Matthew is an ecologist with four years' experience of environmental consultancy work. He holds a HND in Environmental Management with distinction. Matthew is an experienced great crested newt surveyor with competency in great crested newt surveys, habitat suitability assessments and the production of reports providing advice on best practice, mitigation and compensation works relating to great crested newts as may be required. Matthew holds a Natural England and Countryside Council for Wales licence, since 2002.

Surveyor 1

Helen Staton - Natural England Class 1 Licence: 2015-18041-CLS-CLS

2.4 Field Surveys

2.4.1. Habitat Survey

Charnia Ecology has conducted a Preliminary Ecological Appraisal in August 2016

3. Results

3.1. Pre-Survey Data Search

3.1.1. Designated & Non-Designated Sites

SK059439	**Churnet Valley Railway**	LWS	Broadleaved woodland alongside a railway with associated dry and wet woodland flora. A stream runs through part of the site and a pool with a mix of species in its marginal vegetation is also a feature.
SK064425	**Rakes Dale**	LWS	Two steep-sided converging valleys with a stream at the bottom. A mixture of poor semi-improved grassland and remnant acid grassland as well as broadleaved woodland is present.
SK068425	**Toothill Wood**	BAS	A predominantly oak and birch wood on a steep bank above the River Churnet with abundant bracken ad frequent occurrences of ancient woodland indicator species earlier in the season.
SK063430	**Rainroach Rock**	LWS	A broadleaved woodland with extensive bracken and bramble but which also supports ancient woodland indicator species near the path and on the slopes above the paths.
SK063433	**Lord's Bridge (north of)**	LWS	A disused section of canal running through an area of ancient semi-natural woodland.
SK065432	**Barbary Gutter**	LWS	Broadleaved woodland with a stream running through it. Much of the understory is Rhododendron and open areas are Bracken. Ancient woodland Indicators can be found near the banks of the stream.
SK076405	**Jeffreymeadow (south of)**	LWS	The area alongside the Warilow Brook which is wooded for the most part but also has patches of unimproved neutral grassland. The woodland supports a rich ground flora including species associated with wet areas.
SK076429	**Abbey Wood**	LWS	A large expanse of woodland surrounding Alton Towers. There are sycamore plantations, but the main core of woodland being semi-natural showing a good age structure of trees with frequent mature beech, yew and maturing oak.
SK079426	**Castle Wood**	LWS	An area of mature birch/oak woodland on a steep north-facing slope, there are exposed sandstone rock faces across the slope, known as Alton Cliffs.
SK080405	**Nabb Farm (south-west of)**	LWS	A mixture of species rich neutral grassland, broadleaved woodland with a rich woodland flora and a network of species-rich hedgerows.
SK080420	**Saltersford Lane**	LWS	A green lane which runs from Alton in the west towards Denstone. The lane is quite wide and is bounded by diverse hedges. Between the hedges there is a grassy area to one side of which flag stones have been laid to form a narrow surfaced path.
SK085435	**Alton Park**	LWS	A lowland wood pasture with a number of veteran trees in the southern field. In the north-east is an abundance of scattered oak and sweet chestnut over poor semi-improved grassland on a north facing slope.
SK080440	**Hazlehurst Brook**	Retained BAS	A narrow stream valley which becomes progressively more steeply-incised towards the eastern end where there are a series of linked pools fed by the stream. A tributary joins towards the centre of the site, where there is a waterfall.
SK090426	**Crump Wood**	LWS	An area of broad-leaved woodland dominated by birch with mature beech along the crest. Additionally there are areas of unimproved acid and neutral grassland and a small area of heathland.
SK091427	**Crumpwood Fields, Caldon Canal and Park Banks Meadow**	LWS	An area of somewhat rank, dampish grassland with a ditch running east-west across the field. Despite its rather rank nature, the field appears unimproved and retains such species as *Betonica officinalis* and *Dactylorhiza fuchsia*.
SK093428	**The Sprink**	LWS	Broadleaved woodland on a steep south-westerly facing slope, with a line of cliffs, and Bracken-dominated clearings.

3.1.2. Protected Species

Great crested newts are currently given UK BAP (2007) Priority Species Status. Staffordshire Ecological Records identified no records within 2 km of the proposed application area.

Field Surveys

3.2.1. Habitat Description

The proposed development considers ca. an acre of garden lawn area to the side and rear of the grade II listed building “The Stone House” in the village of Alton, Staffordshire. The site is abutted by Malthouse road and residential buildings to the east and south, with a woodland belt embankment encompassing the north and western boundaries. The gardens contain a mix of ornamental non-native and native shrubs, with a number of mature/semi mature fruit trees scattered around selected borders.

Pre-survey data shows NO records of GCN within a 1-2km radius of the proposed development area. There is one ornamental garden pond present just outside the proposed development area on the northern boundary. It is not yet known if this is to be retained within the proposed scheme. There is a standing water body located ca.330m west of site, which could not be assessed due to restricted land access. A further pond (HSI 0.62 average) encroaches just outside the search radius (ca.550m due NE).

Habitat Suitably Index of the ornamental pond is considered as having average potential for GCN (HSI 0.62). However, the surrounding landscape with intensively farmed agricultural land and manmade barriers severe connectivity potential for the metapopulation ecology of this species between sites overall.

The habitats onsite vary in their suitability for supporting great crested newts. The garden grassland offers sub optimal potential while the stone walling, hedgerows and areas of bracken show suitability for foraging and shelter.

The below is an extract from SureScreen confirming that the test samples past all the markers and confirmed a negative result.

Plate 1: Showing a extract from the results confirming a negative result for Great Crested Newt eDNA.

SureScreen Scientifics

Folio No: E4555
Report No: 1
Order No: ALTON01
Client: ABSOLUTE ECOLOGY
Contact: Helen Staton
Contact Details: helen@absoluteecology.co.uk, helen@absoluteecology.co.uk
Date: 01/05/2019

TECHNICAL REPORT

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

Date sample received at Laboratory: 18/04/2019
Date Reported: 01/05/2019
Matters Affecting Results: None

RESULTS

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
1538	Webster Alton, Malthouse Road		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.

4. Assessment

4.1. Constraints on Survey Information

The survey visits were carried out during the optimum breeding season for great crested newts in good weather and suitable temperatures; therefore, no constraints were identified.

4.2. Constraints on Equipment Used

No constraints on survey equipment was identified.

4.3. Potential Impacts of Development

4.3.1. Designated Sites

The located protected sites identified on the Staffordshire Ecological Record Search shows various separations from the application site and the protected sites also given the physical distance from the application site, it is considered highly unlikely that the development will have any impact on this site.

4.3.2. Great Crested Newt Habitat

The site itself provides suitable habitat for Great Crested Newts, however the results from the eDNA test provides a negative result and confirms that Great Crested Newts are absent from the pond, therefore a low possibility that they would be terrestrial therefore no impact is envisaged.

4.4. Legislation and Policy GuidancePolicy guidelines

PAS 2010	The published 'PAS 2010' 'Planning to halt the loss of biodiversity' is the government's new policy aimed at all authorities and developers involved in the planning process in the UK to halt biodiversity decline by 2010 and deliver net biodiversity gains as part of the green infrastructure provisions.
National Planning Policy Framework, Section 11:	The recently published framework in 2012 replaces the previous Planning Policy Statement 9. Section 11: Conserving and enhancing the natural environment, reaffirms the government's commitment to maintaining green belt protection and preventing urban sprawl, retains the protection of designated sites and preserves wildlife, aims to improve the quality of the natural environment and halt declines in species and habitats, protects and enhances biodiversity and promotes wildlife corridors.
Article 10 of the EC Habitats Directive:	The published Article requires government to develop features such as 'stepping stones' in the landscape, such as clusters of ponds, tracts of rough grassland or scrubland and vegetated railway line embankments.
Wildlife and Countryside Act 1981:	Great crested newts are fully protected under the Wildlife and Countryside Act 1981, the European Conservation (Natural Habitats etc.) Regulations 1994, and the Countryside and Rights of Way Act 2000. This legislation makes it illegal to possess or control any live or dead specimens, to damage, destroy or obstruct access to any structure or place used for shelter, protection or breeding, and to intentionally disturb a great crested newt while it is occupying a structure or place which it uses for that purpose.
Conservation of Habitats and Species Regulations (2010)	The Conservation of Habitats and Species Regulations 2010 consolidate all the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994, in respect of England and Wales. It is an offence to possess, sell or offer, or transport for sale any great crested newt or any part derived from such a species. These Regulations also remove the 'incidental result defence'. In other words, it is no longer a defence to show that the killing, capture or disturbance of a species covered by the Regulations or the destruction or damage of their breeding sites or resting places was the incidental and unavoidable result of a lawful activity. Natural England can grant European Protected Species (EPS) licences in respect of development to permit activities that would otherwise be unlawful.
Natural Environment and Rural Communities Act (2006)	Under Section 40 of the Natural Environment and Rural Communities Act (2006), public bodies, including Local and Regional Planning Authorities, have a duty to 'have regard' to the conservation of biodiversity in England when carrying out their normal functions, which includes consideration of planning applications. In compliance with Section 41 of the Act, the Secretary of State has published a list of species considered to be of principal importance for conserving biodiversity in England. This is known as The England Biodiversity List, all of which make up the UK BAP Priority Species. Regional Planning Bodies and Local Planning Authorities will use it to identify the species that should be afforded priority to maintain, restore and enhance species and habitats.

Please note: If great crested newts are present at the site, the purpose of this report will only summarize the potential requirements for a great crested newt mitigation package or project. A

separate mitigation report or project will include the necessary compensation measures to maintain the conservation status of a European Protected Species.

5. Recommendations and Mitigation

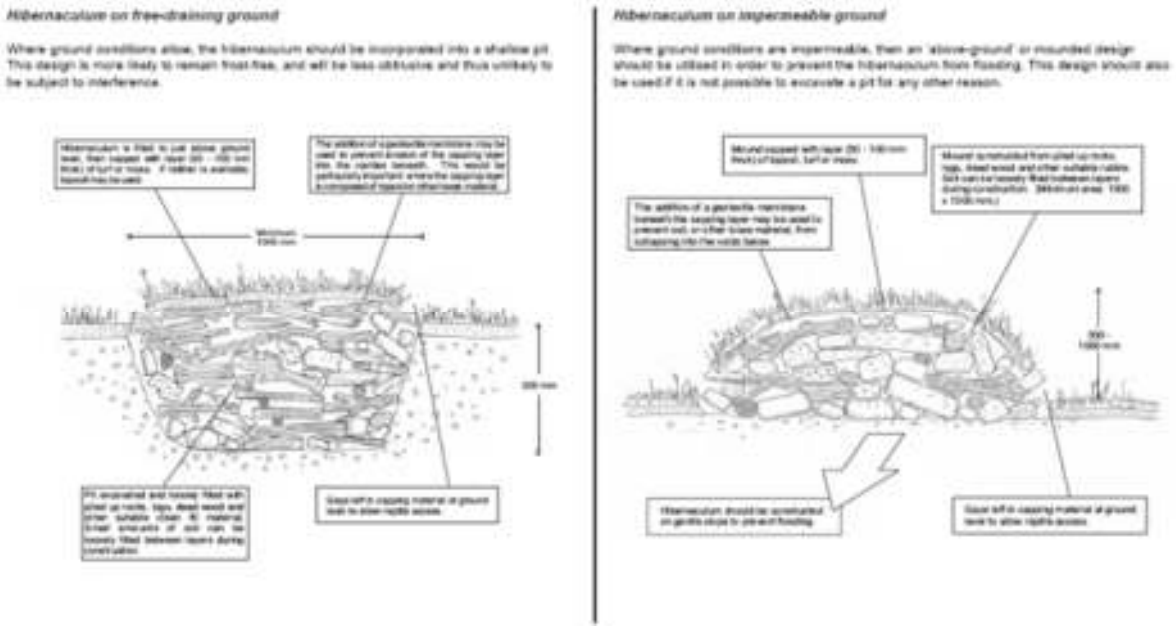
5.1. Further Surveys

No further surveys are necessary in this instance. In line with Natural England guidelines, further surveys would only be required if the proposed works were to be delayed for two breeding surveys. If this is the case, a repeat presence/absence survey is recommended before works commence, to check whether survey evidence and the status of the ponds remains the same as that described within this report.

5.2. Mitigation Measures

5.2.1. Proposed Mitigation Enhancement

No great crested newts were identified during the surveys, although suitable habitat opportunities could be created within the site, in particular the area which has the potential to support Great Crested Newts, as enhancement may attract Great Crested Newts to the site. Great crested newt enhancement could include hibernacula log piles: this would provide more cover and a place of rest for great crested newts and other species of wildlife. If material is piled loosely along with rubble and dead wood, the turves arising from the turf strip could be used to provide refugia/hibernacula habitat for reptiles (see diagrams below).



5.2.2. Care and Vigilance during Works

Great crested newts could still be found on site. Any contractors on site should therefore be advised to carry out all work with care and vigilance for this species. Should any great crested newts be found during works, then works must cease and a licensed ecologist must be consulted before works can continue.

5.3. Mitigation Licences

As no great crested newts were identified using the eDNA method it is considered that all effort has been made to ascertain if great crested newts are present or absent. Therefore, the development will not require a Mitigation Licence.

6. Summary

The existing pond on site was subjected to an eDNA and all the tests suggested that Great Crested Newts are not present within the pond.

References

The Conservation (Natural Habitats, &c.) Regulations 1994, 2007 & 2010. HMSO.

Countryside and Rights of Way Act (2000).

Natural England (2001) *Great Crested Newt Mitigation Guidelines*. Natural England.

Wildlife and Countryside Act (1981).

Appendix 1 Pre-Survey Data Search

