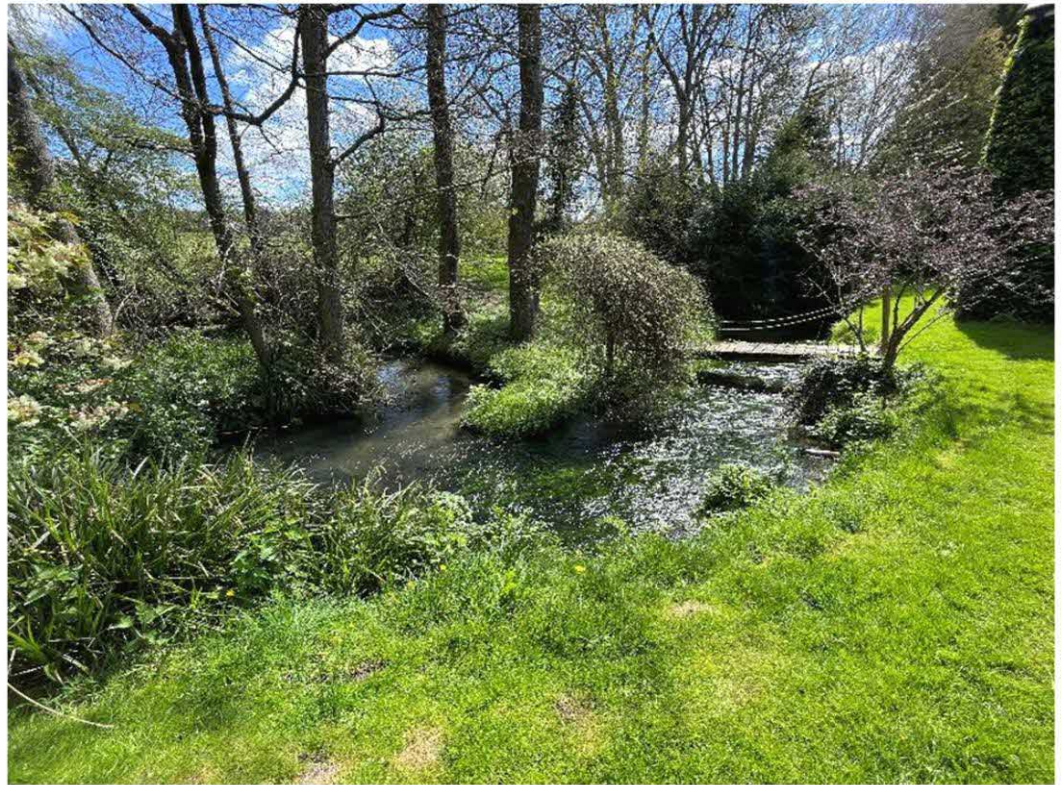




Great Crested Newt eDNA  
Survey



Alderbrook House,  
Union Lane, Kingsclere  
RG20 4SS

GR: SU 52910 59640


April 2023



## Contents

Contract Details .....	2
1. Summary.....	3
Summary of Mitigation and Enhancement Required.....	3
3. Introduction .....	4
4. Site Description .....	4
5. Survey Objectives .....	5
6. Survey Methodology .....	5
Advantages of eDNA.....	5
Constraints .....	5
Methodology and Good Practice.....	6
Great Crested Newt Habitat Suitability Index .....	6
Desk Study .....	7
7. Location Map .....	8
8. Survey Results.....	9
Great Crested Newt Habitat Suitability Index (HSI) .....	9
9. Assessment .....	9
10. Conclusions .....	9
Impact of the Proposed Development.....	9
11. Recommendations.....	10
Good Practice.....	10
12. Appendices .....	11
2. HSI .....	11
13. References and Further Information .....	13

## Contract Details

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## Notice

Ecological Surveys Limited was commissioned to undertake a Great Crested Newt eDNA sample survey of a water-body at the above site proposed for development. This report details the results and conclusions of this survey. The results of this survey are deemed to be valid for 12 months from date of survey. If development works are to be carried out after this time has elapsed, an updated survey will be required.

This survey was undertaken with all proper and reasonable skill and care in a professional manner and in accordance with accepted standards, methodologies and guidelines and is based on the evidence recorded at the site at the time of the survey. The information gathered is considered sufficient to provide an assessment of the ecological interest on the site and justify the recommendations provided in this report.

Refer to [Appendix 1: Legislation Bat and Bird Species](#) for details of Bat and Bird Law and Legislation and <http://www.nwcu.police.uk/> regarding avoiding committing wildlife crime.



## 1. Summary

An eDNA sample testing survey commencing 25/04/2023 on the site known as Alderbrook House on two ponds within ownership, did not find evidence of protected species Great Crested Newts. The result was returned as NEGATIVE. Consequently, the absence of Great Crested Newts on this site is considered (99%) proven. It was therefore concluded that unmitigated proposed works to this site would not cause disturbance/harm or death to this species on site.

### Summary of Results

Sample	O/S reference	Sample Integrity Check	Degradation Check	Inhibition Check	Positive	Positive Replicates
Alderbrook House Pond 1	SU 5289 5960	Pass	Pass	Pass	Negative	0
Alderbrook House Pond 2	SU 5291 5968	Pass	Pass	Pass	Negative	0

It is concluded that to undertake the proposed works, a European Protected Species Licence (EPSL) will NOT be required from Natural England.

### Summary of Mitigation and Enhancement Required

Summary of Mitigation	Summary of Enhancements
Not applicable	Not applicable
Please refer to the body of the report for full details	

### Summary of Further Action

It is considered that the proposed development will NOT have an impact on local Great Crested Newt populations. There are no further recommendations for mitigation or enhancement in this case. Any provision made to enhance the site for Great Crested Newts in particular and amphibian in general, will therefore, be at the discretion of the client in this case.



### 3. Introduction

Ecological Surveys Limited was commissioned to undertake a Great Crested Newt Survey using the process known as eDNA for this site. This followed a previous survey: PEA\_AlderbrookHouse\_Goldsbrough\_May2023 which identified a potential presence of Great Crested Newts at this site per its location and habitat.

The purpose of the eDNA survey undertaken was to establish the usage of the site by Great Crested Newts; to identify any potential ecological constraints on the development and to provide guidance on the Natural England EPSL licensing or alternative procedures if required.

An eDNA Great Crested Newt Survey was deemed to be the appropriate survey in this case for the time of year and integrity of results.

### 4. Site Description



Pond 1 is a relatively large, still, garden pond with no fish. Pond 2 is a mostly still, u-shaped pond that has been separated from an adjacent stream due to silt build up. There were moorhens using pond 2 at the time of the PEA survey. HSIs carried out on both ponds found them to both be of 'below average' value.

## 5. Survey Objectives

The survey specifically aimed to provide:

Confirmation of the approximate population class size of Great Crested Newts on the site and whether breeding is taking place onsite.

Advice on appropriate mitigation, if applicable.

## 6. Survey Methodology

In 2014, the use of eDNA to record species occupancy in ponds was approved in several EU countries for a range of species that included GCN.

The technique of using eDNA to record species occupancy in ponds involves taking water samples from ponds and testing for traces of the species DNA in the water.

eDNA is DNA that is collected from the environment in which an organism lives, rather than directly from the organism itself and can be collected through a water sample and analysed to determine if target species of interest have been present. GCN DNA may persist within water where there is occupancy for several weeks.

The GCN is considered a pond species with a relatively low detection rate using traditional methods of sampling. Usually, several negative repeat samples of the same site are needed to provide a reasonably high confidence that the species is truly absent from the site and any individual GCN that is in the pond has a higher likelihood of being detected, even in conditions that are not conducive to traditional sampling (e.g. murky waters).

### Advantages of eDNA

Ease of deployment e.g. no restrictions on time of day for sampling

More accurate detection ability for evidence of presence (GCN eDNA in water degrades in the pond in about 20 days, so a positive result shows the species has been present recently. (Thomsen 2011)

Less Intrusive for species and potentially safer

Appropriate survey technique for 'murky waters'

Some research has shown that the eDNA method can give an indication of population density rather than just occupancy (Thomsen et al, 2011).

It is thought that a negative result will be a much stronger indication of true absence

Survey protocols have been developed which show an accuracy of 99.3% compared to traditional survey methods which can be only 75% accurate.

### Constraints

Currently, for presence/absence surveys, eDNA can only be sampled between 15 April and 30 June.

*The date of the survey was time sensitive for 25/04/2023.*

GCN activity is mostly land-based and ponds are used for displaying and breeding, negative results will only mean the pond is not a GCN habitat within that breeding period.



eDNA will not provide an accurate and reliable idea of population size (i.e. numbers of newts present) so, where licencing requires it conventional survey techniques are likely to be more appropriate.

*The result was negative therefore no accurate or reliable population size is necessary.*

#### Methodology and Good Practice

<i>Advisory</i>	<i>RISK</i>
Cross contamination from:	Clothing/tools from other ponds and sites. Use of DNA free sampling kits.
Inflow:	Note inflows from other ponds which may give false DNA result.
Habitat:	Other animals may track DNA from other ponds in vicinity.
False results	Low numbers of newts may = low eDNA

#### Good Practice

- Follow good practice as indicated by eDNA sampling Company
- Refrigerate samples if kept over night
- Gently stir water NOT sediment to raise DNA from the bottom of the water body
- Avoid water less than 5-10cm deep
- Do not take sediment from the bottom of the pond (may contain historical eDNA)
- Sample water in habitat suited to egg laying of less densely packed vegetation
- Sample open water suited to displaying
- Sample from pond margins, around 20 different sampling points.

The Great Crested Newt Survey was also undertaken in accordance with guidance provided by the Great Crested Newt Mitigation Guidelines (English Nature 2001).

#### Great Crested Newt Habitat Suitability Index

The ponds onsite were classified using the Great Crested Newt Habitat Suitability Index (HIS) (Oldham et al, 2000). The HIS is a numerical index between 0 and 1, wherein a score of 1 represents optimal habitat for great crested newts. The HIS score is used to define the suitability of the pond on a categorical scale. It should be noted, however, that the system is not precise enough to conclude that a pond supports or does not support great crested newts.



## Desk Study

An ecological desk study was undertaken for the proposed development area and its surroundings, comprising of ecological data obtained from MAGIC and National Biodiversity Network Atlas. The search area including a 2km radius of the full site boundary. No records of GCN were found.

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## 7. Location Map



## 8. Survey Results

### Great Crested Newt Habitat Suitability Index (HSI)

Two ponds were classified according to the great crested newt habitat suitability index (see Table below for the individual pond score and Section 6 for locations of the surveyed ponds).

#### *ARGUK GCN HSI Calculator*

Pond Name		Pond 1	Pond 2
Grid Ref		SU 5289 5960	SU 5291 5968
SI No	SI Description	SI Value	
1	Geographic location	1	1
2	Pond area	0.05	0.05
3	Pond permanence	1	1
4	Water quality	0.67	0.33
5	Shade	1	1
6	Water fowl effect	1	0.67
7	Fish presence	1	1
8	Pond Density	0.4	0.4
9	Terrestrial habitat	0.67	0.67
10	Macrophyte cover	0.6	0.9
HSI Score		0.59	0.55
Pond suitability (see below)		Below average	Below average

#### Categorisation of HIS Score by Paul Diamond

<i>HSI Score</i>	<i>Pond Suitability</i>
< 0.50	Poor
0.50 – 0.59	Below average
0.60 – 0.69	Average
0.70 – 0.79	Good
> 0.80	Excellent

Please refer to Appendices for HIS Guidance notes.

## 9. Assessment

Two ponds were surveyed for the presence of Great Crested Newts.

The survey visit extracted water from the pond for E-DNA testing and followed appropriate Good Practice

NO Great Crested newts were recorded as present within the pond or pond margins.

## 10. Conclusions

### Impact of the Proposed Development

Based on the results of the eDNA testing, it is considered highly UNLIKELY that the proposed works will potentially cause disturbance and or injury to Great Crested Newts.



It will NOT be necessary to apply for obtaining an EPSL from Natural England under the Conservation of Habitats and Species Regulations 2010, to legally allow the removal of Great Crested Newt aquatic and terrestrial habitat.

## 11. Recommendations

### Good Practice

As a matter of good practice, any contractors should be made aware of the potential presence of Great Crested Newts. In the event that a Great Crested Newt is found during any unsupervised stages of the works, activity should stop in the vicinity and advice should be sought from Ecological Surveys Ltd (Tel: 01503 240769 or 07736 458609).

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## 12. Appendices

### Legislation

Great Crested Newts and their habitat are protected by law, under Schedule 5 of the Wildlife and Countryside Act 1981, the CRow Act 2000, and the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as the Habitats Directive. This Directive is implemented in the UK by The Conservation of Habitats and Species Regulations 2010 (better known as the Habitats Regulations).

Under this legislation, it is illegal to:

- deliberately capture, injure or kill GCNs
- damage or destroy a GCN resting place or breeding site
- deliberately or recklessly disturb a GCN while it's in a structure or place of shelter or protection
- block access to structures or places of shelter or protection

Disturbance of animals includes in particular any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or in the case of animals of a hibernating or migratory species, to hibernate or migrate; or to affect significantly the local distribution or abundance of the species.

GCN are listed as Species of Principal Importance for Nature Conservation in England.

Where works are proposed that would result in offences being committed, a European Protected Species License (EPSL) is required under the Habitats Regulations. An EPSL must be applied for from Natural England, permitting activities that would otherwise be deemed illegal.

### 2. HSI

#### Great Crested Newt Habitat Suitability Index - Background

The Habitat Suitability Index (HSI) for the great crested newt was developed by Oldham et al. (2000). HSI scoring systems were originally developed by the US Fish and Wildlife Service as a means of evaluating habitat quality and quantity. An HSI is a numerical index, between 0 and 1. 0 indicates unsuitable habitat, 1 represents optimal habitat. The HSI for the great crested newt incorporates ten suitability indices, all of which are factors thought to affect great crested newts. These ten suitability indices are retained in this current Guidance Note. The HSI system proposed by Oldham et al. (2000) is fairly easy to use. However, one suitability index (SI9, terrestrial) involves a more lengthy measurement and calculation than the other factors. In using the HSI system with volunteer surveyors in Kent, Lee Brady substituted a simpler evaluation of terrestrial habitat quality, a four- point scale. Volunteers have found this modified HSI relatively easy to use.

Several other, local, surveys have utilised the HSI, but utilised their own variations on the original system. In 2007, a workshop was held at the Herpetofauna Workers' Meeting to evaluate the use of the HSI for the great crested newt, with the aims of:

- identifying components of the system that may need clarification or refinement



- agreeing on a standard that can be easily used by volunteers and professionals alike. A conservative approach has been adopted in modifying the use of the original HSI suitability indices.

#### Use and limitations of HSI

The HSI for great crested newts is a measure of habitat suitability. It is not a substitute for newt surveys. In general, ponds with high HSI scores are more likely to support great crested newts than those with low scores. However, the system is not sufficiently precise to allow the conclusion that any particular pond with a high score will support newts, or that any pond with a low score will not do so.

There is also a positive correlation between HSI scores and the numbers of great crested newts observed in ponds. So, in general, high HSI scores are likely to be associated with greater numbers of great crested newts. However, the relationship is not sufficiently strong to allow predictions to be made about the numbers of newts in any particular pond.

HSI scoring can be useful in:

- Evaluating the general suitability of a sample of ponds for great crested newts
- Comparing general suitability of ponds across different areas
- Evaluating the suitability of receptor ponds in a proposed mitigation scheme.

#### How to collect data and calculate HSI

The HSI is a geometric mean of ten suitability indices:

$$\text{HSI} = (\text{SI1} \times \text{SI2} \times \text{SI3} \times \text{SI4} \times \text{SI5} \times \text{SI6} \times \text{SI7} \times \text{SI8} \times \text{SI9} \times \text{SI10})^{1/10}$$

- The ten Suitability Indices are scored for a pond, in the field and from map work.
- The ten field scores are then converted to SI scores, on a scale from 0.01 to 1 (0.01 is used as the bottom end of the range instead of 0, because multiplying by 0 reduces all other SI scores to 0).
- The ten SI scores are then multiplied together  $1/10$
- The tenth root of this number is then calculated (X)

The calculated HSI for a pond should score between 0 and 1.

Some of the field scores are categorical, some are numerical. The numerical field scores are converted to SI scores by reading off the values from graphs produced by Oldham et al. (2000) reproduced in this Guidance Note.

The field scores are the data that should be collected by a surveyor. A summary of data to collect is given in Summary of scoring system below. More full details of the scoring system, including descriptions of the criteria used in the categorical scores are given in Details of Suitability Indices and Definitions of Categories. Two of the SI scores (SI1 and SIa) can be carried out as desktop/map exercises and so do not have to be completed in the field. The remaining SI scores should be recorded as field scores, and later converted to suitability indices, in some cases reading SI scores from the graphs provided in Details of Suitability Indices and Definitions of Categories.



### 13. References and Further Information

- Countryside and Rights of Way Act 2000. HMSO  
Conservation of Habitats & Species Regulations 2010. HMSO  
UK Biodiversity Action Plan [www.ukbap.org/uk](http://www.ukbap.org/uk)  
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'Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*)'. Oldham R. S., Keeble, J., Swan, M. J. S. and Jeffcote, M. Herpetological Journal 10 (4), 143-155. (2000)  
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