LIZARD
Landscape Design and Ecology

GREAT CRESTED NEWT EDNA REPORT

Chesapeke, Reeds Lane, Sayers Common

On behalf of: Antler Homes

Client:	Antler Homes			
Project:	Chesapeke, Reeds Lane, Sayers Common			
Reference:	LLD2858-ECO-REP-002-00-GCN			
Revision:	**Date:**	**Author**	**Proof**	**Approved**
00	06/06/23	Catherine O'Reilly MCIEEM	Caleb Fry ACIEEM	Catherine O'Reilly MCIEEM

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Validity:

This report is valid for 18 months from the date of the site visit. If works have not commenced by this date, an updated site visit should be carried out by a suitably qualified ecologist to assess any changes in the habitats present on site, and to inform a review of the conclusions and recommendations made.

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SUMMARY

Lizard Landscape Design and Ecology has been commissioned by Antler Homes to undertake amphibian surveys of ponds within 500.0m of Chesapeke, Reeds Lane, Sayers Common (located around central grid reference: *TQ 26489 18046* – hereafter referred to as 'the site'

There are a total of 14no. ponds within 500m of the site. 2no. of these are located within 250m of the proposed development, the nearest being 140m north. 5no. of these ponds were surveyed in association with nearby developments between 2012 and 2022. None of these previously surveyed ponds were found to support great crested newts.

4no. additional ponds within 500.0m of the site were subject to eDNA survey, with water samples collected on the 12th of May 2023 before analysis by SureScreen Scientifics.

Analysis of the samples indicated the **likely absence** of great crested newts within these ponds. Given the absence of great crested newts during previous surveys, and negative result of these eDNA surveys, the site is considered to be of **negligible value** to GCN and no specific mitigation measures with regards this species is required.

1.0 INTRODUCTION

1.1 Lizard Landscape Design and Ecology has been commissioned to undertake great crested newt (GCN) surveys to inform the proposed development of the Chesapeke, Reeds Lane, Sayers Common (*Grid Reference: TQ 43887 00275 – hereafter referred to as 'the site'*).

1.2 Surveys were recommended following the original ecology survey completed by this company in December 2022, which identified 2no. ponds within 250.0m of the site, and a further 12no. within 500.0m.

Survey Rationale

1.3 The site consists of modified grassland, surrounded by hedgerow and scattered trees.

1.4 Although the modified grassland within the site offers generally sub-optimal terrestrial habitat, proposals shall likely require the removal of areas of scrub, hedgerows and tall ruderal vegetation which offers suitable habitat. Further survey work to assess the potential impacts upon this species was therefore undertaken to rule out the presence of great crested newts within these ponds.

Site Information

1.5 The survey area covers c. 1.5 hectares (ha) of grassland fields located towards the south-western edge of Sayers Common. The site is enclosed by mature, mixed-species hedge and treelines and is bordered by Reeds Lane to the north, residential properties to the east and west and farmland to the south.

Surrounding Landscape

1.6 The site is located to the south-western edge of Sayers Common. Surrounding landscape to the south and west is rural, with the nearest large settlement of Burgess Hill located 3.1 (km) to the east, while the properties of Hurstpierpoint are located 1.5km south-east. Surrounding land is dominated by arable fields and grazing land interspersed with small shaws and mature tree / hedge lines.

Development Proposals

1.7 It is understood that the development proposals include the construction of a c. 33no. new residential dwellings with associated access, gardens and parking.

Aims

1.8 The aim of the amphibian and great crested newt survey was;

- *To identify presence / absence of amphibians (including great crested newt (GCN) within the water bodies identified within 500.0m of the site.*
- *To suggest population size classes for newt species recorded, where present;*
- *To complete all data requirements for any possible application to Natural England for a mitigation licence if required; and;*
- *To suggest mitigation to avoid / minimise impacts of the scheme to Protected Species if necessary.*

2.0 LEGISLATION

2.1 Legislation relating to wildlife and biodiversity of particular relevance to this report includes:

- *The Conservation of Habitats and Species Regulations 2017;*
- *The Wildlife and Countryside Act 1981 (as amended);*
- *The Natural Environment and Rural Communities (NERC) Act 2006.*

2.2 The great crested newt is included on *Schedule 2 of The Conservation of Habitats and Species Regulations* 2017 (as amended) and *Schedule* 5 of the *Wildlife and Countryside Act 1981* (as amended) which makes it an offence, amongst other things, to deliberately capture, injure, kill or disturb any such species. In addition, this notification also prohibits the deliberate taking or destroying of any eggs and the damaging, destroying or blocking access toa breeding site or resting place of any such species.

2.3 The common toad *(Bufo bufo)* is a target of UK and Local Biodiversity Action Plans and listed as *Species of Principle Importance under Section 41 of the Natural Environment and Rural Communities Act 2006.* Local Authorities are obliged to have regard to the purpose of conserving biodiversity with particular emphasis on targeted species.

2.4 In addition, the National Planning Policy Framework (*NPPF*) 2021 sets out the government planning policies for England and how they should be applied. '*Chapter 15: Conserving and Enhancing the Natural Environment*' states that development should be '*minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures*.'

3.0 METHODOLOGY

3.1 Desk Study

3.1.1 Sussex Biodiversity Records Centre (SxBRC) provided records of all protected and notable species within a 2.0km radius of the site.

3.1.2 In accordance with Natural England's GCN Mitigation Guidelines (English Nature, 2001) a desktop search was undertaken to identify ponds within 500m and 250m of the site using Ordnance Survey mapping, the *MAGIC* database and aerial photography.

3.2 HSI Assessment

3.2.1 The waterbodies within 500.0m of the site (*where access allowed*), were subject to a HSI assessment in May 2023.

3.2.2 The *Habitat Suitability Index (HSI)* was developed by *Oldham et al (2000)* as a way of providing a numerical index allowing a direct comparison to be made between different water bodies. This index assesses ponds against ten different criteria, each of which have a bearing on the likelihood of great crested newts (*GCN*) being present in the pond under consideration.

3.2.3 The ten attributes against which ponds are assessed are:

- *Geographic Location;*
- *Pond Area (at its highest water level);*
- *Permanence;*
- *Water Quality;*
- *Perimeter Shading;*
- *Numbers of Wildfowl;*
- *Numbers of Fish Present;*

- *Pond Count (within a 1.0km radius);*
- *Terrestrial Habitat (within 250.00m);*
- *Macrophyte Coverage.*

3.2.4 The HSI results in a score between 1 and 0; with 1 being optimal conditions and 0 being unlikely to support a population. However, the index merely gives an indication as to whether a pond has the potential to support GCNs and is not a substitute for more detailed presence / absence surveys for protected species of amphibian. The evaluation criteria is shown in *Table No. 01* below.

Table No. 01 – HSI Evaluation Criteria

HSI Score	*Pond Suitability*
<0.5	Poor
0.5-0.59	Below Average
0.6-0.69	Average
0.7-0.79	Good
>0.8	Excellent

3.3 eDNA Survey

3.3.1 An eDNA survey of surroundings ponds was completed on the 12th of May 2023.

3.3.2 20no. water samples were collected from the margin of each pond, with samples spaced as evenly as possible to collect a representative sample. All samples were collected using a sterile sampling kit as supplied by SureScreen Scientifics.

3.3.3 Each sample was stored in a refrigerator before return to SureScreen Scientifics for analysis. The results of the survey indicate the presence of absence of great crested newt environmental DNA within the water body.

4.0 RESULTS

4.1 Desk Study

4.1.1 26no. records of great crested newt *Triturus cristatus* exist within 2.0km of the site, as well as records of common toad *Bufo bufo*, smooth newt *Lissotriton vulgaris*, common frog *Rana temporaria* and palmate newt *Lissotriton helveticus.* The closest GCN record is located 575m north of the site, recorded in 2013.

4.2 HSI Assessment

4.2.1 Pond P1 is a small pond located within a small area of scrubby woodland c. 330m west of the proposed development site. The pond was heavily shaded, with abundant leaf litter which reduced water quality to 'poor'.

4.2.2 Pond P2 is located within a recreation ground c. 470m north-east of the site. The pond is surrounded by trees and scrub with playing fields beyond. Fish presence could not be ruled out, however no detrimental effects caused by wildfowl were recorded.

4.2.3 Pond P3 is located between a road and residential properties c. 250m from the proposed site. Dense trees and scrub casts shade to the margins however some macrophyte cover was noted to the more open aspects. Fish presence could not be ruled out, however no detrimental effects caused by wildfowl were recorded.

4.2.4 Pond P4 is a recently constructed / extended pond located 320m north of the site. The open occupies an open position with macrophyte vegetation to the margins. A number of sticklebacks were recorded during the HSI assessment.

4.2.5 The HSI Index, as shown in the below table dictates the ponds as providing varying levels of habitat suitability for great crested newt.

Table No.2 – Summary HSI Results

SI Description	***P1***	***P2***	***P3***	***P4***
Location	*1*	*1*	*1*	*1*
Pond area	*0.2*	*1*	*0.4*	*0.8*
Permanence	*0.5*	*0.9*	*1*	*0.9*
Water quality	*0.33*	*0.67*	*0.67*	*0.67*
Shade	*0.2*	*0.2*	*0.8*	*1*
Waterfowl effect	*1*	*1*	*1*	*1*
Fish presence	*1*	*0.67*	*0.67*	*0.33*
Pond density	*0.9*	*0.9*	*0.9*	*0.9*
Terrestrial habitat	*0.67*	*0.67*	*0.33*	*0.67*
Macrophyte cover	*0.3*	*0.3*	*0.4*	*0.5*
HSI Score	***0.51***	***0.65***	***0.67***	***0.73***
Pond suitability	***Below Average***	***Average***	***Average***	***Good***

4.3 eDNA Survey

4.3.1 Each pond was negative for great crested newt environmental DNA, suggesting the absence of GCN within the waterbodies.

4.4 Survey Constraints / Considerations

4.4.1 All phase 2 surveys were undertaken at the appropriate time of the year by trained, licenced surveyors. There were no constraints recoded relating to survey methodology, therefore the results are considered to a true representation of conditions within the surveyed waterbodies.

4.4.2 Access was only possible to 4no. of 14no. ponds within 500.0m of the site; however the majority of ponds which could not be surveyed are isolated from the site by residential development, located 400-500m away or were previously surveyed and found not to support GCN. The overall level of survey effort is considered to be robust enough to give credibility to the conclusions reached in this report.

5.0 CONCLUSION

5.1 Great crested newts were found to be absent from all surveyed ponds therefore no specific mitigation with regards this species is required.

5.2 Given the likely absence of great crested newts in the vicinity of the site, the scheme is highly unlikely to contravene protection afforded this species under The Conservation of Habitats and Species Regulations 2017 (as amended).

6.0 REFERENCES

- English Nature (2001) Great Crested Newt Mitigation Guidelines, English Nature.

- Froglife (2001) Great Crested Newt Conservation Handbook. Froglife.

- Joint Nature Conservation Committee, (1998) Herpetofauna Workers' Manual. JNCC, Peterborough.

- Natural England (2015) Template for Method Statement to support application for licence under Regulation 53(2)e of The Conservation of Habitats and Species Regulations 2010 (as amended) in respect of great crested newts (Triturus cristatus). Form WML-A14-2 (Version December 2015).

Appendix A – Pond Images

Image 01 – Pond P1, assessed as below average suitability and negative for GCN environmental DNA.

Image 02 - Pond P2, assessed as average suitability and negative for GCN environmental DNA.

Image 03 - Pond P3, assessed as average suitability and negative for GCN environmental DNA.

Image 04 - Pond P4, assessed as good suitability and negative for GCN environmental DNA.

Appendix B – eDNA Results

SureScreen Scientifics

Folio No: E17450
Report No: 1
Purchase Order: LLD2818
Client: LIZARD LANDSCAPE DESIGN AND ECOLOGY
Contact: Catherine O'Reilly

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 17/05/2023
Date Reported: 25/05/2023
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
1636	Chesapeke - Pond P3	-	Pass	Pass	Pass	Negative	0
3855	Chesapeke - Pond P4	-	Pass	Pass	Pass	Negative	0
3856	Chesapeke - Pond P2	-	Pass	Pass	Pass	Negative	0
3857	Chesapeke - Pond P1	-	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Gabriela Danickova **Approved by:** Jackson Young

METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

SIC: **Sample Integrity Check** [Pass/Fail]
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.

DC: **Degradation Check** [Pass/Fail]
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

IC: **Inhibition Check** [Pass/Fail]
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result: **Presence of GCN eDNA** [Positive/Negative/Inconclusive]
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. 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. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.