Brooks Ecological
Grounded advice

Great Crested Newt Survey
Land off Lundhill Road, Wombwell, Barnsley

Report reference: R-2667-04
June 2017

Report Title:	Great Crested Newt Survey Land off Lundhill Road, Wombwell, Barnsley
Report Reference:	R-2667-04
Written by:	Rob Weston BSc MSc MCIEEM Technical Director
Technical review:	Rob Weston BSc MSc MCIEEM Technical Director
QA review:	Joshua Birchall BSc (Hons) Grad CIEEM Assistant Ecologist
Approved for issue:	Rob Weston BSc MSc MCIEEM Technical Director
Date:	14.06.17

Brooks Ecological
Grounded advice

Unit A, 1 Station Road, Guiseley Leeds LS20 8BX
Phone **01043 884451**

Email: admin@brooks-ecological.co.uk

www.brooks-ecological.co.uk

Summary Statement

None of the surveyed ponds have been found to support the protected great crested newt.

Survey has found the ponds to support small numbers of common frog and smooth newt.

eDNA analysis has revealed the presence of great crested newt within pond 5, with presence also assumed in pond 4. Given the absence of eDNA within ponds along the southern Site boundary it is considered likely that canal and road form a barrier to movement.

Given the likely absence of great crested newt from ponds within the zone of influence of the Site, there are unlikely to be legal constraints to the proposed development of the Site in relation to amphibians.

Introduction

1. Subsequent to the recommendations made in Brooks Ecological Ltd Preliminary Ecological Appriasal (R-2667-01.2), detailed great crested newt survey was commissioned for a Site known as 'Land off Lundhill Road', Wombwell, Barnsley, SE 405 018.

Figure 1 Aerial view of ponds with reference numbers. Application site is shown in red.

2. The survey was required to determine if great crested newt were likely to be affected by proposals to build houses on land within 250m of the surveyed ponds.

3. Ponds are described as follows:

4. Pond 1 is a large and well established balancing pond behind the pub on Lundhill Road. This is fringed by marginal vegetation dominated by reedmace (Typha latifolia), but has a significant area of open water. This pond is separated from the Site by c.80m of rough grassland.

5. Pond 2 is much smaller and is dominated by dense greater reed mace. Aerial photographs suggest it is has terrestrialised significantly over recent years and it contained no open water during survey in August 2016. This pond borders the Site directly.

6. Pond 3 is the linear 'pond like structure' created by the dead arm of the Elsecar Canal. It seems likely that the Canal still takes some flow of water, however this is imperceptible close to the Site. The canal is steep sided in most places although it banks are now silted up and colonised by riparian vegetation including reed mace, greater willowherb (Epilobium hirsutum) and burr reed (Sparganium erectum). Much of the canal is colonised by a dense screen of floating duckweed (Lemma sp.). The canal supports a good head of fish with many perch being apparent during the survey, and introduced red-necked terrapin could be seen basking next to the Site. The canal borders the Site directly.

7. Ponds 4, 5 and 6 are balancing features apparently created as part of works to the Pennine Trail and the Cottonwood Retail Park. Although not completely isolated form the Site, access between these ponds and the Site is made very difficult by a combination of the canal, the fast-flowing Knoll Beck and the Dearne Valley Parkway trunk road.

8. Pond 7 was discovered by the adjacent landowner during our 2017 surveys works, it is a small sump type pond devoid of vegetation.

9. Other potential habitat for GCN comprises a series of variably wet ditches present within the Site.

10. Records for the area are held by Barnsley Biological Records Centre which returned no records of great crested newt (GCN) within 2km of the application site. However, this could represent a lack of survey effort rather than absence of species.

11. A positive eDNA test was returned for ponds 1, 2, 3, 4 and 6 during work by another consultancy in 2016. Discussion with the laboratory which carried out the testing suggests that this could be related to surveyor error or to difficulties with lab processing during this time. This result should be given little weight.

Legal background

12. Great crested newts receive full legal protection being listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are therefore subject to the provisions of Section 9 which make it an offence to:

- intentionally kill, injure or take a great crested newt;
- possess or control any live or dead specimen or anything derived from a great crested newt;
- intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a great crested newt; or
- intentionally or recklessly disturb a great crested newt while it is occupying a structure or place which it uses for that purpose.

13. It is also listed under the Conservation of Habitats and Species Regulations 2010 which under the provisions of Regulation 41 make it an offence to:

(a) deliberately capture, injure or kill any wild animal of a European protected species;

(b) deliberately disturb wild animals of any such species;

(c) deliberately take or destroy the eggs of such an animal; or

(d) damage or destroy a breeding site or resting place of such an animal.

14. Works affecting protected species require a licence from Natural England. Licences can only be granted if there is no satisfactory alternative or if the action authorised will not be detrimental to the maintenance of the population of the species at a favourable conservation status in its natural range.

Methodology

15. Ponds relevant to the Site and its proposed development were considered to be ponds 1, 2, 7 and the Site's wet ditches. These were subject to a standard survey protocol as well as the collection and analysis of eDNA samples. Standard surveys ceased as soon as absence had been confirmed by eDNA testing.

16. The canal is considered to be wholly unsuitable for breeding by GCN on the basis of its thriving predator populations - fish (such as stickleback and roach) and red necked terrapin.

17. Study was extended to cover eDNA surveys of ponds 4, 5 and 6 in case they provided evidence helpful in explaining the previous results or context in designing any mitigation required.

18. Standard survey protocol required that ponds were visited on up to four separate occasions during April and May 2017, with each visit using a range of methods including egg search, netting, torch counts and bottle trapping in accordance with English Nature Great Crested Newt Mitigation Guidelines 2001. Surveys were directed by Rob Weston BSc (Hons) MSc MIEEM. Rob is a highly experienced ecologist and registered to use Class Licence CL08 in respect of surveying for great crested newt.

19. Updating eDNA surveys involved taking water samples from 20 different locations in each pond; focusing on areas where newts were more likely to gather. For each pond these were combined, and redistributed into six sample pots before being sent off for analysis. This involved using sterile kits supplied by Surescreen Scientifics laboratory and followed methodology as advised in the Natural England Technical Advice Note (WC1067), taking necessary measures to avoid contamination between ponds.

20. The egg search involved an examination of submerged marginal vegetation to determine the presence of newt eggs. A hand held net was then used along the margins of the pond to collect any adult newts or larvae.

21. Torch counting involved 'sweeping' the whole area of the ponds using a powerful torch to determine the presence and relative abundance of any adult amphibians and to note the presence of larvae.

22. Bottle traps were placed overnight in ponds and checked early next morning for collected amphibians.

23. The visits were carried out on the 21st March and 18th of April 2017. All surveys were carried out during optimal conditions with air and water temperatures above 5°C.

Results

24. Surveys were conducted in suitable weather conditions: low wind, dry and with air temperature ranging between 10 °C and 15°C.

25. No great crested newts were found in any of the ponds or ditches during the surveys. Amphibian species recorded included small numbers of smooth newt and common frog as well as a larger population of common toad in Pond 1.

26. Full survey results are shown in the tables provided in Appendix 1.

2017 eDNA Results

27. A total of nine samples were taken one form each feature except the larger pond 2 (two samples) and the ditches (2 samples).

Figure 2 Results of the eDNA pond testing as returned form - adapted to show consistent pond references

CustomerReference	Fera Reference	GCN Detection	GCN Score	Inhibition	Degradation
Pond 7	S17-003829	Negative	0	No	No
Ditch (a)	S17-003823	Negative	0	No	No
Pond 5	S17-003824	Positive	1	n/a	n/a
Pond 4	S17-003825	Inconclusive	0	No	YES
Pond 1 (a)	S17-003826	Negative	0	No	No
Ditch (b)	S17-003827	Negative	0	No	No
Pond 2	S17-003828	Negative	0	No	No
Pond 1 (b)	S17-003831	Negative	0	No	No

28. With the exception of ponds 4, 5 and 6, all of the ponds returned a negative result for GCN eDNA. This is consistent with the results of standard protocol surveys carried out.

29. Pond 5 returned a positive result for GCN eDNA, with both pond 4 and 6 providing inconclusive results. The full results are provided as Appendix 2 of this report, this includes the results for pond 6 which were not included within the table by Fera and as in figure 2.

Evaluation

30. Dedicated amphibian survey demonstrates the likely absence of Great Crested Newt from all of the ponds surveyed which are within the zone of influence of the Site, and strongly suggest that this species will be absent from the proposed development Site.

31. Given these findings there are no anticipated constraints to the proposed development of the site in relation to GCN.

32. eDNA results from ponds which are separated from the Site by the canal, a watercourse and a busy dual carriageway are all likely to contain GCN during their breeding period. This finding reinforces the action of these features as a barrier to the movement and helps to explain how cross contamination could have resulted in the previous eDNA results.

33. The ditches within the Site have been found to be of low value to amphibians and their loss will not be significant to this group.

34. Of the other ponds within the zone of influence of the Site only pond 1 appears to be associated with any significant amphibian population, with large numbers of breeding toad present early in the season.

Recommendations

35. Common toad is a Species of Principle Importance under the NERC Act 2006 and is likely to use the Site to some extent as terrestrial habitat. Measures should be put in place to protect the conservation status of common toad. Suitable measures would include:

    - Providing connectivity across the southern boundary of the Site - allowing movement along the canal corridor to other wetland habitats.

    - The provision of semi-natural habitat along the boundaries of the Site closest to pond 1 - where possible these should include wetland features likely to be attractive to toads such as ponds or areas of wet grassland. Rubble or log pile structures could also be provided in these areas to act as refuges for amphibians.

References

English Nature (2001) Great Crested Newt Mitigation Guidelines.

Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus). Herpetological Journal 10 (4), 143-155.

Natural England (2013) Standing Advice Species Sheet: Great crested newts http://publications.naturalengland.org.uk/publication/810429?category=30014

Analytical and methodological development for improved surveillance of the Great Crested Newt – WC1067 – Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA. http://fera.co.uk/agriculture-horticulture/documents/Natural%20England%20Protocol.docx

Appendix 1 – Amphibian Survey Results

Table 1: Amphibian Survey Summary: Pond 2

Visit	Date	Weather Conditions	Amphib's	Survey Methods				Notes
				Torch	Bottle Traps	Netting	Egg Search	
1	21/03/17	5-7˚C, Dry, sunny, still	GCN	-	-	-	-	TRB = 2 VC = 5 No. of Bottle = 19
			Other	-	-	-	F	
2	18/04/17	7C Dry, Clear, still	GCN	-	-	-	-	TRB = 3 VC = 5 No. of Bottle = 34
			Other	1F	3SN	-	-	

GCN=great crested newt SN=smooth newt PN= palmate newt F=frog T=toad ♀= female ♂= male

Table 2: Amphibian Survey Summary: Ditches

Visit	Date	Weather Conditions	Amphib's	Survey Methods				Notes
				Torch	Bottle Traps	Netting	Egg Search	
1	21/03/17	5-7˚C, Dry, sunny, still	GCN	-	N/A too shallow	-	-	TRB = 2-5 VC = 2
			Other	-		-	F	
2	18/04/17	7C Dry, Clear, still	GCN	-	N/A too shallow	-	-	TRB = 2 VC = 4
			Other	-		-	-	

GCN=great crested newt SN=smooth newt PN= palmate newt F=frog T=toad ♀= female ♂= male

Table 3: Amphibian Survey Summary: Pond 1

Visit	Date	Weather Conditions	Amphib's	Survey Methods				Notes
				Torch	Bottle Traps	Netting	Egg Search	
1	21/03/17	5-7˚C, Dry, sunny, still	GCN	-	-	-	-	TRB = 2-3 VC = 1-2 No. of Bottle = 86
			Other	19F, 60T, Stickleback	4SN, 1T	-	-	
2	18/04/17	7C Dry, Clear, still	GCN	-	-	-	-	TRB = 2 VC = 2 No. of Bottle = 65
			Other	1SN, 1F	1SN,1 T			

GCN=great crested newt SN=smooth newt PN= palmate newt F=frog T=toad ♀= female ♂= male

Table 5: Amphibian Survey Summary: Pond 7

Visit	Date	Weather Conditions	Amphib's	Survey Methods				Notes
				Torch	Bottle Traps	Netting	Egg Search	
2	18/04/17	7C Dry, Clear, still	GCN	-	N/A too deep	-	-	TRB = 3 VC = 0/1
			Other	-		-	-	

GCN=great crested newt SN=smooth newt PN= palmate newt F=frog T=toad ♀= female ♂= male

Appendix 2 – eDNA Results

DNA Analysis Report - Commercial in Confidence

Customer:	Brooks Ecological Ltd
Address:	Unit A, 1 Station Road Guiseley Leeds West Yorks LS20 9LP
Contact:	Joshua Birchall
Email:	jsb@brooks-ecological.co.uk
Tel:	01943884451
Report date:	04-May-2017
Order Number:	GCN17-0366
Samples:	Pond Water
Analysis requested:	Detection of Great Crested Newt eDNA from pond water.

Thank you for submitting your samples for analysis with the Fera eDNA testing service. The details of the analysis are as follows:

Method:

The method detects pond occupancy from great crested newts (GCN) using traces of DNA shed into the pond environment (eDNA). The detection of GCN eDNA is carried out using real time PCR to amplify part of the cytochrome 1 gene found in mitochondrial DNA. The method followed is detailed in Biggs J., et al, (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA. Freshwater Habitats Trust, Oxford.

The limits of this method are as follows: 1) the results are based on analyses of the samples supplied by the client and as received by the laboratory, 2) any variation between the characteristics of this sample and a batch will depend on the sampling procedure used. 3) the method is qualitative and therefore the levels given in the score are for information only, they do not constitute the quantification of GCN DNA against a calibration curve, 4) a 'not detected' result does not exclude presence at levels below the limit of detection.

The results are defined as follows:

Positive:	DNA from the species was detected.
eDNA Score:	Number of positive replicates from a series of twelve.
Negative:	DNA from the species was not detected; in the case of negative samples the DNA extract is further tested for PCR inhibitors and degradation of the sample.
Inconclusive:	Controls indicate degradation or inhibition of the sample, therefore the lack of detection of GCN DNA is not conclusive evidence for determining the absence of the species in the sample provided.

DNA Analysis Report - Commercial in Confidence

CustomerReference	Fera Reference	GCN Detection	GCN Score	Inhibition	Degradation
deep new pond -2667 WOMBWEL	S17-003829	Negative	0	No	No
on site ditch-2667 WOMBWELL	S17-003823	Negative	0	No	No
off site (1) -2667 WOMBWELL	S17-003824	Positive	1	n/a	n/a
off site (3) -2667 WOMBWELL	S17-003825	Inconclusive	0	No	YES
big pond (3) East -2667 WOMBWE	S17-003826	Negative	0	No	No
running ditch -2667 WOMBWELL	S17-003827	Negative	0	No	No
Pond (1) -2667 WOMBWELL	S17-003828	Negative	0	No	No
big pond (3) West -2667 WOMBW	S17-003831	Negative	0	No	No

The results indicate that eDNA for great crested newts was detected in one of the samples and in the remaining samples eDNA was not detected (as detailed in the table above). However, with sample S17-003825 we detected degradation of the internal control. Therefore, due to the risk of any eDNA also being degraded resulting in a false negative, we have issued an inconclusive result.

A sample was returned for kit S17-003830 however, due to the large quantity of sediment the which sample contained we were unable to perform a successful DNA extraction. Therefore we are unable to return a result for this sample.

Analysis was conducted in the presence of the following controls: 1) Extraction blank, 2) appropriate positive and negative PCR controls for each of the TaqMan assays (GCN, Inhibition, and Degradation). All controls performed as expected.

This test procedure was developed using research funded by the Department of Environment, Food and Rural Affairs, and was performed under the conditions of licensing arrangements with Applied Biosystems and patent rights owned by F. Hoffman-La Roche Ltd.

Issuing officer: Steven Bryce
Tel: 01904 462 324
Email: e-dna@fera.co.uk