

M3 Junction 9 Improvement

Scheme Number: TR010055

6.3 Environmental Statement Appendix 8.1v - Great Crested Newt HSI and eDNA Survey 2021

APFP Regulation 5(2)(a)

Planning Act 2008

**Infrastructure Planning (Applications: Prescribed Forms and
Procedure) Regulations 2009**

Volume 6

November 2022

Infrastructure Planning

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

M3 Junction 9 Improvement Development Consent Order 202[x]

6.3 ENVIRONMENTAL STATEMENT- APPENDIX 8.1v: GREAT CRESTED NEWT HSI AND eDNA SURVEY 2021
--

Regulation Number:	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference:	TR010055
Application Document Reference:	6.3
BIM Document Reference:	HE551511-VFK-EBD-X_XXXX_XX-TN-LE-0010
Author:	M3 Junction 9 Improvement Project Team, Highways England

Version	Date	Status of Version
Rev 0	November 2022	Application Submission

TECHNICAL NOTE

Job Name: M3 Junction 9 Improvement
Job No: 330610074
Note No: HE551511-VFK-EBD-X_XXXX_XX-TN-LE-0010
Date: 16 July 2021
Prepared By: Ed Austin
Subject: Great Crested Newt HSI and eDNA Survey

1. Introduction

- 1.1. Stantec UK has been commissioned by Volker Fitzpatrick to undertake surveys for great crested newts in relation to the M3 Junction 9 Improvement Scheme (the Scheme). Further surveys consist of Habitat Suitability Index (HSI) surveys and Environmental DNA (eDNA) surveys.
- 1.2. The Indicative Application Boundary along with the area subject to survey can be viewed on the Great Crested Newt Survey Location Figure in **Appendix A**, and will be referred to as 'the Survey Area' throughout this report.
- 1.3. The Scheme is located to the north-east of Winchester and includes proposed improvements to Junction 9 of the M3 and the A34 around an approximate central grid reference of SU496308.

Background

- 1.4. M3 Junction 9 is a key transport interchange which connects South Hampshire and the wider sub-region, with London via the M3 and the Midlands/North via the A34. A significant volume of traffic currently uses the grade separated, partially signalised gyratory (approximately 6,000 vehicles per hour during the peak periods) which acts as a bottleneck on the local highway network and causes significant delay throughout the day.
- 1.5. Highways England is looking to reconfigure the junction to improve the situation for vehicle traffic and non-motorised users.
- 1.6. As part of a wider ecological assessment of the area potentially affected by the Scheme, WSP (on behalf of Highways England) completed an assessment of 10 ponds within proximity of the scheme to determine their suitability to support great crested newts (WSP, 2017). Eight of these ponds were subject to water sampling to detect great crested newt environmental DNA (eDNA), with the results being negative for all ponds sampled (i.e. no great crested newt eDNA was detected). The Indicative Application Boundary of the scheme was updated in December 2018 to include modifications and additions to the design. As a result of this change, Jacobs were commissioned by Highways England to undertake habitat suitability assessment and eDNA surveys of a further three ponds in 2019 (Jacobs, 2020) with 6 other ponds identified determined to have very limited likelihood to provide suitable habitat following a desk-based assessment (with access not provided). Again, the eDNA surveys returned negative results. The WSP and Jacobs surveys indicated great crested newts are likely absent from the area affected by the proposed scheme.
- 1.7. Given the time that has passed since the previous surveys, and further updates to the Indicative Application Boundary, Stantec was commissioned to complete updated surveys from great crested newts across the Scheme. The aim of this was to gather data on the current presence/likely absence of great crested newts.

TECHNICAL NOTE

- 1.8. Great crested newts and their habitats are legally protected under the Conservation of Habitats and Species Regulations (the 'Habitats Regulations') 2017 (as amended) and the Wildlife and Countryside Act, 1981 (as amended) (WCA).
- 1.9. In addition, great crested newts are listed as a species of principal importance to the conservation of biodiversity in England. This list was drawn up in response to the requirements of Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006; it is often referred to as the 'S41 list'. The S41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under the related Section 40 of the NERC Act, to have regard to the conservation of biodiversity in England, when carrying out their normal functions.

2. Method

- 2.1. A desk-based exercise was initially undertaken by Stantec (using online mapping and aerial images) which identified a total of 37 waterbodies within the Indicative Application Boundary or within a 500m buffer (including ponds previously surveyed by WSP and Jacobs). Sixteen of these waterbodies were scoped out of further surveys in 2021, either because of barriers to dispersal between the waterbody and the Scheme (e.g. urban development or major roads), or because of unsuitability for great crested nests (e.g. where the waterbody was part of a trout fishery).
- 2.2. As such 21 waterbodies were taken forward for further field survey. The location of ponds identified for survey in 2021 are shown on **Figure 1 Great Crested Newt Survey Locations, Appendix A**.
- 2.3. Following the identification of waterbodies, access permission was sought by Stantec to survey the 21 waterbodies identified. Access permission was not granted for a total of 5 ponds. A further waterbody was identified as a watercress bed, so considered unlikely to provide suitable habitat. For this reason, only a habitat suitability assessment (HSI) was requested with no eDNA sampling undertaken.
- 2.4. This left a total of 15 waterbodies requiring both HSI and eDNA survey, although it was not initially known if all these features were present on the ground.
- 2.5. The eDNA survey (water sampling) was completed by two experienced ecologists over 4th and 5th May 2021. Samples were collected based on the recommended protocol by Natural England (Biggs *et al.*, 2014) and were sent to FERA for subsequent analysis. The current survey guidance states that water samples can be collected between the 15th of April and the 30th of June. The survey dates were therefore within this optimal window.
- 2.6. In addition, information on the physical features and characteristics of each of the waterbodies was collected (where found to be present) in order to allow a great crested newt Habitat Suitability Index (HSI) score to be derived (see Oldham *et al.*, 2000, as modified by the Herpetological Conservation Trust (HCT, 2008)). Ten suitability indices (SI) were scored in the field and from maps; these included features such as size, quality of surrounding terrestrial habitat and the potential presence of fish. These scores were then used to calculate the overall HSI for each waterbody, provided as a number between 0 and 1, with 0 being the least suitable and 1 being the most suitable. The HSI score allows the waterbody to be placed in one of five pre-defined categories (HCT, 2008), defining its suitability for great crested newts as follows:
 - <0.5 = poor
 - 0.5 – 0.59 = below average
 - 0.6 – 0.69 = average

TECHNICAL NOTE

- 0.7 – 0.79 = good
- >0.8 = excellent

2.7. Weather conditions on the 4th and 5th May were cool (13°C) and dry with a gentle to moderate breeze (Beaufort scale force 3 to 4) and partial cloud (4/8 to 6/8 cloud cover).

3. Results and Interpretation

- 3.1. The full summary of the eDNA survey results and HSI scores for each waterbody visited and found to be present are provided in **Appendix B** with photographs of waterbodies provided in **Appendix C**.
- 3.2. During the survey, 4 of the 15 waterbodies identified for possible eDNA survey were found to not be present on the ground (i.e. no feature present or found to be dry). A total of 11 waterbodies were therefore successfully subject to eDNA survey. The analysis by FERA returned a negative result for all of waterbodies surveyed (the DNA Analysis Report is presented in **Appendix D**).
- 3.3. As set out in **Paragraph 2.3**, due to access being refused, it was not possible to undertake detailed survey at a number of waterbodies. However, it is considered that the current level of survey, along with historical survey data, provides reasonable confidence in the likely status of great crested newt within the Survey Area.
- 3.4. Based on the results of the survey (and taking into account the results of previous surveys completed by WSP and Jacobs), great crested newts are considered likely to be absent from the Scheme and surrounding local area, as concluded by the previous WSP and Jacobs surveys. As such there are no known constraints relating to great crested newts associated with the Scheme.

4. Conclusions

- 4.1. Stantec UK has been commissioned by Volker Fitzpatrick to undertake surveys for great crested newts in relation to the M3 Junction 9 Improvement Scheme (the Scheme). Further surveys consist of Habitat Suitability Index (HSI) surveys and Environmental DNA (eDNA) surveys.
- 4.2. Based on the results of the surveys during 2021, and taking into account historical surveys results, great crested newts are considered likely to be absent from the Scheme and surrounding local area, as concluded by the previous WSP and Jacobs surveys. As such there are no known constraints relating to great crested newts associated with the Scheme.

5. References

- 5.1. Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford.
- 5.2. Herpetological Conservation Trust (HCT) (2008) Habitat Suitability Index – Guidance Notes. National Amphibian and Reptile Recording Scheme. HCT.
- 5.3. Jacobs (2020). M3 Junction 9 Improvements. Great Crested Newt Survey Update.
- 5.4. Oldham, R. S., Keeble, J., Swan, M. J. S., and Jeffcote, M. (2000) Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). Herpetological Journal 10, pp. 143-155.
- 5.5. WSP (2017). M3 Junction 9 Improvement Scheme. Great Crested Newt Survey Report.

TECHNICAL NOTE

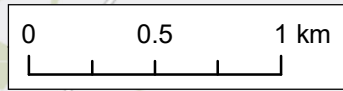
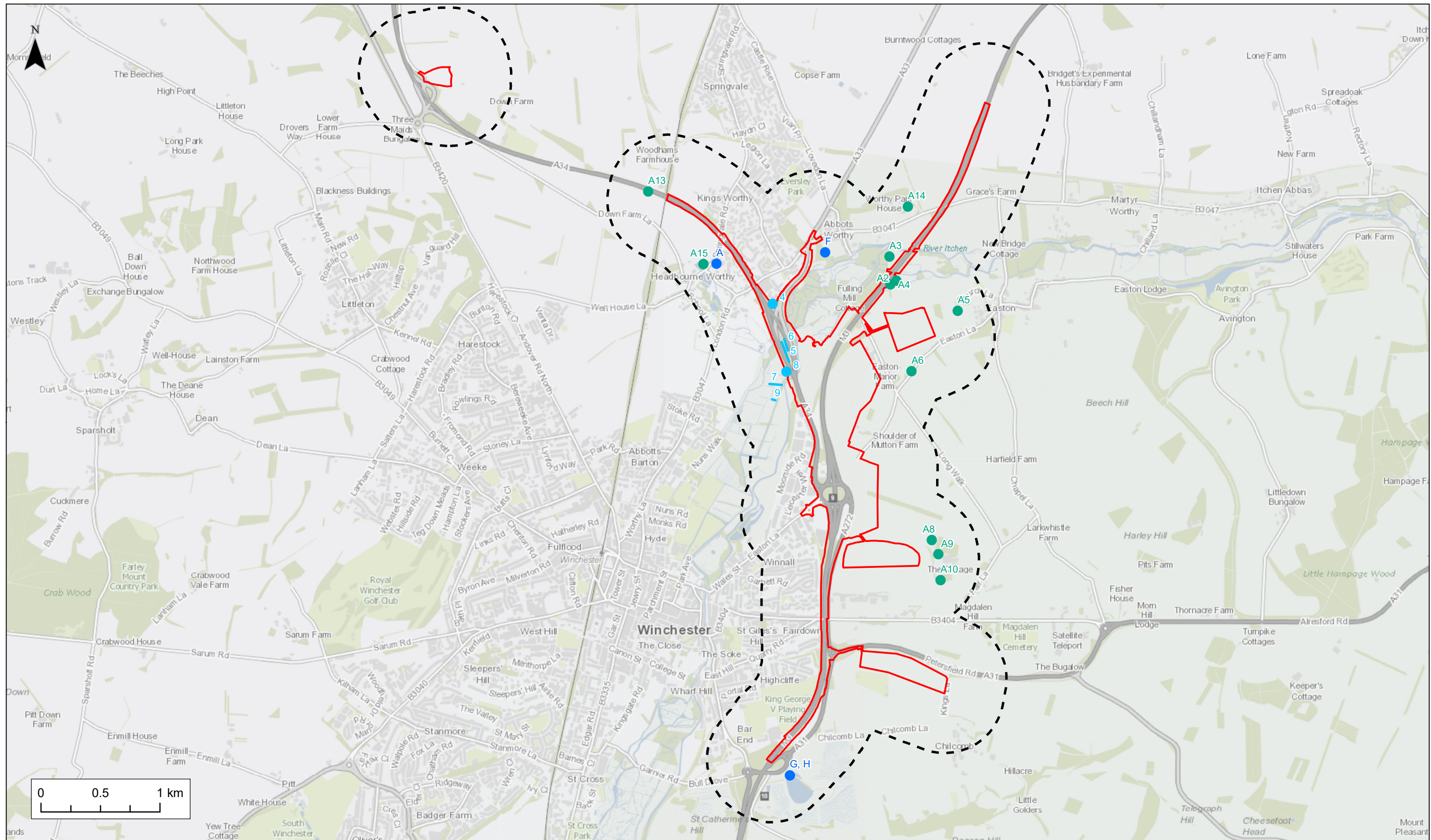
DOCUMENT ISSUE RECORD

Technical Note No	Rev	Date	Prepared	Checked	Reviewed (Discipline Lead)	Approved (Project Director)
HE551511-VFK- EBD-X_XXXX_XX- TN-LE-0010	-	16/07/21	EA	DM	DM	TW

This report has been prepared by Stantec UK Limited ('Stantec') on behalf of its client to whom this report is addressed ('Client') in connection with the project described in this report and takes into account the Client's particular instructions and requirements. This report was prepared in accordance with the professional services appointment under which Stantec was appointed by its Client. This report is not intended for and should

TECHNICAL NOTE

Appendix A - Figures



KEY

- Indicative Application Boundary (IAB)
- 500m Buffer from IAB
- Ponds Identified by Stantec
- Ponds Surveyed by Jacobs
- Ponds Surveyed by WSP
- Ditches Surveyed by WSP

Contains OS data © Crown Copyright and database right 2020

Figure Status	FOR INFORMATION
Client	

Project Title				
M3 JUNCTION 9 IMPROVEMENT				
Figure Title				
GREAT CRESTED NEWT SURVEY LOCATIONS				
Scale: 1:30,000	Designed: TL	Drawn: TL	Checked: GK	Approved: RG
Original Size: A3	Date: 27/04/2021	Date: 27/04/2021	Date: 27/04/2021	Date: 27/04/2021
FIGURE 1				Project Ref No. 48176 Revision: A

TECHNICAL NOTE

Appendix B – Survey Results

Results of the great crested newt surveys undertaken at the 21 waterbodies taken forward for survey in 2021 are provided in **Table 1** below.

Table 1. Results of great crested newt surveys undertaken during 2021

Waterbody Ref	Grid Ref	Within IAB	Within 250m	Within 500m	Dispersal Barrier(s)	Notes	2021 eDNA Access Notes	Results of 2021 eDNA Survey
4	SU491320	Y	Y	Y	None	Shaded pond with dominant duckweed	Surveyed successfully	Negative
5	SU492316	Y	Y	Y	None	Linear attenuation feature with some emergent vegetation	Surveyed successfully	Negative
6	SU493317	Y	Y	Y	None	Linear ditch, shaded and dominated by duckweed	Surveyed successfully	Negative
7	SU492314	N	Y	Y	None	Spring fed ditch linked to River Itchen, dominated by reed	Surveyed successfully	Negative
8	SU492315	Y	Y	Y	None	Small pool connected to ditches and Itchen	Surveyed successfully	Negative
9	SU490312	N	Y	Y	None	Ditch connected to River Itchen, dominated by reeds	Surveyed successfully	Negative
A	SU4870632420	N	Y	Y	Minor roads	Ornamental pond with goldfish	Surveyed successfully	Negative
F	SU4962032517	N	Y	Y	None	No Access. Next to woodland, shaded	No access granted - not surveyed	N/A
G	SU4932428119	N	Y	Y	None	No Access. Close to water treatment works, eutrophic	No access granted - not surveyed	N/A
H	SU4932428119	N	Y	Y	None	No Access. Close to water treatment works, eutrophic	No access granted - not surveyed	N/A
A2	SU5022032280	Y	Y	Y	None	Ditch, possibly connected to River Itchen	Surveyed successfully	Negative
A3	SU5016032481	N	Y	Y	None	Possibly connected to River Itchen	No pond or ditch present	N/A

TECHNICAL NOTE

Waterbody Ref	Grid Ref	Within IAB	Within 250m	Within 500m	Dispersal Barrier(s)	Notes	2021 eDNA Access Notes	Results of 2021 eDNA Survey
A4	SU5016832249	Y	Y	Y	None	Shaded by woodland	No pond or ditch present	N/A
A5	SU5073432026	N	Y	Y	None	Appears to have been created within past few years	Surveyed successfully	Negative
A6	SU5034631518	N	Y	Y	None	Lined, abundant emergent vegetation	No access granted - not surveyed	N/A
A8	SU5051730096	N	Y	Y	None	Large, square, artificial	Surveyed successfully	Negative
A9	SU5057229978	N	Y	Y	None	Drainage ditch, possibly shaded	Dry ditch - not surveyed	N/A
A10	SU5059029758	N	Y	Y	None	Pond within orchard/vineyard	Surveyed successfully	Negative
A13	SU4813233029	N	Y	Y	None	Roadside ditch	Dry ditch - not surveyed	N/A
A14	SU5031632901	N	Y	Y	Minor access road	Garden pond	No access granted - not surveyed	N/A
A15	SU4861632442	N	Y	Y	none	Watercress beds	HSI only as requested	N/A

TECHNICAL NOTE

Results of the HSI surveys undertaken in 2021 are provided in **Table 2** below.

Table 2. Results of great crested newt HSI surveys undertaken during 2021

Pond No.	HSI Scores											Suitability Class
	Location	Area	Permanence	Water Quality	Shading	Waterfowl	Fish	Pond Density	Terrestrial Habitat	Macrophyte Cover	HSI Score	
4	1	0.2	1	0.67	0.2	1	0.67	0.78	1	0.55	0.696383614	Good
5	1	0.4	1	0.67	0.2	1	0.67	0.78	1	0.55	0.65882442	Average
6	1	0.1	1	0.67	0.2	1	0.67	0.78	1	0.5	0.568099518	Below average
7	1	0.3	0.9	1	1	0.01	0.01	0.78	1	1	0.340679371	Poor
8	1	0.2	0.9	1	1	0.01	0.67	0.78	1	1	0.498131712	Poor
9	1	0.15	0.9	1	1	0.01	0.01	0.78	1	1	0.317865093	Poor
A	1	0.2	0.9	1	1	0.67	0.01	0.39	0.67	0.35	0.402027236	Poor
A2	1	1	0.9	1	1	0.67	0.67	0.65	1	0.7	0.844190287	Excellent
A5	1	0.37	0.9	1	1	0.67	0.33	0.65	1	0.6	0.701148095	Good
A8	1	0.8	0.9	1	1	0.01	0.67	0.39	1	0.4	0.487139325	Poor
A10	1	0.15	1	0.67	1	0.67	0.67	0.39	1	0.4	0.609177742	Average
A15	1	0.8	0.9	1	1	1	0.67	0.39	0.67	0.8	0.794993668	Good ¹

¹ Although the HSI score indicates good suitability for waterbody A15, this feature is an active watercress bed which is not reflected in the calculation. This feature would therefore be very unlikely to be suitable for use by great crested newts given the regular disturbance and flushing through of waters.

TECHNICAL NOTE

Appendix C - Photographs



Photograph 1: Pond 4



Photograph 2: Pond 5

TECHNICAL NOTE



Photograph 3: Pond 6



Photograph 4: Pond 7

TECHNICAL NOTE



Photograph 5: Pond 8



Photograph 6: Pond 9

TECHNICAL NOTE



Photograph 7: Pond A



Photograph 8: Pond A2

TECHNICAL NOTE



Photograph 9: Pond A3 (Not Present)



Photograph 10: Pond A4 (Not Present)

TECHNICAL NOTE



Photograph 11: Pond A5



Photograph 12: Pond A8

TECHNICAL NOTE



Photograph 13: Pond A9 (Not Present)



Photograph 14: Pond A10

TECHNICAL NOTE



Photograph 15: Pond A15

TECHNICAL NOTE

Appendix D. eDNA Analysis Report

DNA Analysis Report - Commercial in Confidence



Customer: Austin Foot Ecology
Address: 32 Winchester Road
Whitchurch
Hampshire
RG28 7HP
Contact: Edward Austin
Email: [REDACTED]
Tel: [REDACTED]
Report date: 21-May-2021
Order Number: GCN21-1360
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	eDNA Score	Inhibition	Degradation
-	S21-012080	Negative	0	No	No
-	S21-012082	Negative	0	No	No
-	S21-012083	Negative	0	No	No
-	S21-012069	Negative	0	No	No
-	S21-012070	Negative	0	No	No
-	S21-012071	Negative	0	No	No
-	S21-012073	Negative	0	No	No
-	S21-012075	Negative	0	No	No
-	S21-012077	Negative	0	No	No
-	S21-012078	Negative	0	No	No
-	S21-012079	Negative	0	No	No

The results indicate that eDNA for great crested newts was not detected in any of the samples submitted. 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.

Issuing officer: Steven Bryce
Tel: 01904 462 070
Email: e-dna@fera.co.uk