A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010041

6.8 Environmental Statement – Appendix 9.8 Great Crested Newt Survey Report

Part B

APFP Regulation 5(2)(a)

Planning Act 2008

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

June 2020

Infrastructure Planning

Planning Act 2008

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

The A1 in Northumberland: Morpeth to Ellingham

Development Consent Order 20[xx]

Environmental Statement - Appendix

Regulation Reference:	APFP Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010041
Application Document Reference	TR010041/APP/6.8
Author:	A1 in Northumberland: Morpeth to Ellingham Project Team, Highways England

Version	Date	Status of Version
Rev 0	June 2020	Application Issue

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APPENDICES

1. INTRODUCTION

1.1. PROJECT BACKGROUND

1.1.1. The A1 in Northumberland: Alnwick to Ellingham (Part B) aims to increase capacity along an approximately 8 km section of the existing A1 between Alnwick and Ellingham, in Northumberland. Part B includes widening the existing A1 from single carriageway to a dual carriageway. Part B also includes improving the existing junction at Charlton Mires with a new grade-separated junction and a new accommodation overbridge at Heckley Fence. Part B aims to increase capacity, enhance resilience, improve safety and improve journey times along the route Details of Part B location are provided on the **Location Plan** of this Environmental Statement (ES) (**Application Document Reference: TR010041/APP/2.1**).

1.1.2. Part B comprises dualling of the existing A1 single carriageway; a new southbound carriageway would be constructed to the east of the existing A1, and the existing A1 would act as a new northbound carriageway. A number of Private Means of Access would need to be stopped up and replaced with new access routes including new roads for East and West Linkhall, and from the B6347 and Rock South Farm. To facilitate the construction of Part B, a length of an Extra High Voltage cable, utility pipes and telecommunication cables would need to be diverted. Additionally, a construction compound would be constructed within the Lionheart Enterprise Park adjacent to The Applicant's Gritting Depot, and a Main Compound constructed by Thirston. Part B also includes new drainage features, new and extended culverts, and temporary and permanent Public Right of Way diversions.

1.1.3. This appendix details the methods, results, impact assessment, and recommended mitigation to ameliorate adverse impacts upon great crested newts *Triturus cristatus* (GCN) in respect of Part B.

1.1.4. Within this document, Part B comprises three elements. The Part B Main Scheme Area refers to the Order Limits north of Alnwick and south of Ellingham only. The Order Limits also includes the Lionheart Enterprise Park Compound (eastern and western sites), located to the south of Alnwick, and the Main Compound, which is located within the A1 in Northumberland Morpeth to Felton (Part A).

1.2. ECOLOGICAL BACKGROUND

1.2.1. A desk study and extended Phase 1 habitat survey was completed in 2016 (**Ref. 1**). During this process and survey, ten waterbodies were identified (waterbodies B01 to B10) within a 250 m survey buffer encompassing the A1 carriageway and several proposed Part B options at that time. Habitat Suitability Index (HSI) assessments and eDNA surveys of the ten waterbodies identified were completed in 2016 (**Ref. 2**) to determine suitability and presence of GCN during the Part B options appraisal stage.

It was subsequently concluded that all waterbodies would require further survey, comprising presence/absence surveys, to ascertain presence (or otherwise) of GCN. Owing to the time elapsed since original assessment and confirmation of a final Part B design, a desk study and environmental DNA (eDNA) surveys were repeated, and

presence/absence surveys (where required) undertaken at identified waterbodies during 2018 and 2019.

1.3. BRIEF AND OBJECTIVES

1.3.1. The GCN surveys were completed in accordance with good practice guidance (**Ref. 3**) to:

a. Establish whether GCN are present or likely to be absent from survey areas in respect of Part B; and

b. If present, evaluate the importance of the Order Limits for GCN and make recommendations as to how proposals should account for GCN with respect to legislation, planning and biodiversity policy.

1.3.2. The results of these surveys, and subsequent recommendations, are included within this report.

2. BASELINE IDENTIFICATION METHODOLOGY

2.1. DESK STUDY

2.1.1. A desk study was undertaken in 2019. Information on the location of protected and notable species within 2 km of the Order Limits was requested from the Environmental Records Information Centre for the North East.

2.1.2. The desk study included results within the last ten years (2009-2019), as anything earlier was not considered to be ecologically relevant.

2.1.3. The presence of statutory and non-statutory protected sites that included amphibians as qualifying features or a contributing reason for designation, was also considered as part of the desk study.

2.1.4. The MAGIC (Multi Agency Geographic Information for the Countryside) website was accessed in 2019 to search for Natural England European Protected Species Licence applications relating to GCN within 2 km of the Order Limits. In addition, Natural England protected species licences relating to GCN were identified for any planning applications within 500 m of the Order Limits.

2.2. FIELD SURVEY

HABITAT SUITABILITY INDEX (HSI) ASSESSMENT

2.2.1. All waterbodies within the Order Limits and Survey Area (defined as the Order Limits plus a 250 m buffer), to which access was possible, were assessed for their suitability to support GCN using the standard HSI assessment method (**Ref. 4**) in April and May 2018. Waterbodies were identified using 1:25,000 OS mapping and cross referenced against aerial photography. Identification was confirmed from the results of the Phase 1 survey (**Ref. 1**).

2.2.2. Waterbodies were assessed and scored on ten key variables which are known to influence occupancy of waterbodies by GCN and breeding populations. These variables are:

a. Geographic location;
b. Waterbody area;
c. Waterbody permanence;
d. Water quality;
e. Waterbody shading;
f. Waterfowl presence;
g. Fish presence;
h. Number of waterbodies within 1 km;
i. Bankside terrestrial habitat; and
j. Waterbody macrophyte cover.

2.2.3. Scores for each of the above variables were used to calculate an overall HSI value for each waterbody. This was then cross referenced with the guidelines (**Ref. 4**) to assign the pond to one of five categories: ‘poor, below average, average, good or excellent’. Index calculation is not a failsafe method of identifying whether a waterbody is likely to support a

GCN population; therefore, professional judgement and availability of records of GCN in the locality was used to inform recommendations for further survey.

PRESENCE / LIKELY ABSENCE SURVEY

2.2.4. Presence / likely absence surveys were completed by Natural England licensed surveyors (or those working as agents under licence) across the 2018 and 2019 survey seasons owing to access constraints. Survey methodology comprised four visits as a minimum to each waterbody, spread across the recommended survey period (mid-March to mid-June, with at least two of the visits falling between mid-April and mid-May). Survey visits were completed under suitable weather conditions, when overnight temperatures were above 5°C and wind and rain were not sufficient to affect torchlight survey results (through disturbance to the water surface).

2.2.5. At least three survey techniques were used during each survey visit to search for the presence of GCN in line with good practice (**Ref. 5**). These included:

a. **Torchlight searching** – each waterbody was searched systematically for amphibians after dark using a bright torch; all amphibians observed were recorded, with the number of male, female and juvenile newts of each species noted. The duration of the torchlight survey was determined by the time taken to walk slowly around the waterbody perimeter.
b. **Bottle-trapping** – Traps were set at a ratio of one bottle every 2 m of waterbody perimeter with a maximum of 50 traps per water body. The traps were set prior to dusk and checked and removed the following morning. Traps spent no longer than 12 hours in a pond before collection. At collection of bottles, the sex, species and number of any newt's present was recorded;
c. **Egg searching** – suitable vegetation in each waterbody was searched for the presence of newt eggs, which are laid on submerged or floating leaves and folded around the egg. The duration of the egg search was either the amount of time required to search the vegetation along the edge or at the surface of a waterbody (accessible from the bank) or a maximum of 15 minutes per survey visit[1]; or
d. **Netting** – using a net to sample a waterbody at regular intervals (every 2 m) around the waterbody perimeter.

ENVIRONMENTAL DNA (EDNA) SURVEY

2.2.6. Four waterbodies within the Survey Area required eDNA surveys in 2019 due to access constraints during the 2018 survey season preventing completion of presence/absence surveys. In the absence of presence/absence surveys, eDNA surveys provided the best survey option to determine GCN presence/absence. eDNA surveys of waterbodies B06, B07, B08 and B10 were completed by a Natural England licensed surveyor between mid-April and June 2019 (inclusive) in line with best practice guidance (**Ref. 6**).

[1] Once a GCN egg had been recorded, no egg searching occurred on subsequent visits to avoid unnecessary uncovering of eggs which would then be at an increased risk of predation.

2.2.7. Surveys comprised a single visit to each waterbody. Where waterbodies were in an appropriate condition to undertake sampling, the following protocol was used. The perimeter of the waterbody (where accessible) was walked to identify locations from where water samples could be collected. Samples were taken following standard guidance (**Ref. 6**), involving taking twenty 30 ml samples of water per waterbody from locations spread evenly around the waterbody margins (from both open water and vegetated areas if present). The samples were taken from as deep as possible, taking care not to collect sediment.

2.2.8. Samples from each waterbody were pooled in separate collection bags. Six 15 ml samples were then taken from each bag and each put in sample tubes containing preserving fluid. Water was collected using sterile, standard water sampling kits for eDNA sampling supplied by Nature Metrics (Limited). Samples were returned to Nature Metrics (Limited) for analysis for the presence/absence of GCN marker DNA.

2.2.9. Surveys were undertaken on 18 April 2019 for waterbodies B06, B07 and B08. While B010 was surveyed on 2 July 2019.

3. ECOLOGICAL IMPACT ASSESSMENT METHODOLOGY

3.1. OVERVIEW

3.1.1. This section describes the methodology used to identify significant effects of impacts on the relevant ecological receptor, latterly identifying mitigation to ameliorate/remove such effects or impacts. The Ecological Impact Assessment (EcIA) adopts guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM) (**Ref. 7**) and the Design Manual for Roads and Bridges (DMRB) Interim Advice Note (IAN) 130/10 'Ecology and Nature Conservation: Criteria for Impact Assessment (**Ref. 8)**

3.1.2. Ecological receptors have been subject to nature conservation evaluation. The significance of effects has then been assessed taking into account the characterisation of potential impacts (including duration, extent and reversibility) and their consequent effects on important ecological receptors.

3.2. NATURE CONSERVATION EVALUATION

3.2.1. Ecosystems, habitats and species are assigned levels of importance for nature conservation based on the criteria detailed within CIEEM guidance (**Ref. 7**), IAN 130/10 (**Ref. 8**) and summarised in **Table 3-1** of this chapter. The rarity, ability to resist or recover from environmental change and uniqueness of an ecological receptor, function/role within an ecosystem and level of legal protection or designation afforded to a given ecological receptor are all factors considered in determining its importance. Consideration has also been given to the importance of the species or habitat and its conservation status at a geographic level taking population size, life cycle, rarity and/or distribution into account.

3.2.2. In addition, the importance of an ecological receptor takes into account any statutory or non-statutory designations, the intrinsic importance of the ecological receptor and whether it supports legally protected or notable species.

Table 3-1 - Importance Criteria

Importance	Criteria
International or European	Ecosystems and Habitats - Ecosystems or habitats essential for the maintenance of: – Internationally designated areas or undesignated areas that meet the criteria for designation; and/or – Viable populations of species of international conservation concern. Species: – Species whose presence contributes to the maintenance of qualifying habitats, communities and assemblages that occur within internationally designated sites or within undesignated areas that meet the criteria for such designation.

Importance	Criteria
	– Resident, or regularly occurring, populations of species that may be considered at an International or European level including those listed on Annexes II, IV and V of the Habitats Directive and Annex I of the Birds Directive, where: – The loss of the population would adversely affect the conservation status or distribution of the species at this geographical stage; or – The population forms a critical part of a wider population at this scale; or – The species is at a critical phase of its life cycle at this scale
UK or National	Ecosystems and Habitats - Ecosystems or habitats essential for the maintenance of: – Qualifying communities and assemblages that occur within nationally designated sites or within undesignated areas that meet the criteria for such designation; and/or – Viable populations of species of national conservation concern. – Areas of ancient woodland. – Habitats listed for their principal importance for biodiversity (Section 41 of the NERC Act 2006). Species: – Species whose presence contributes to: – The maintenance of qualifying habitats, communities and assemblages that occur within nationally designated sites or within undesignated areas that meet the criteria for such designation; or – The maintenance and restoration of biodiversity and ecosystems at a national level, as defined in the Natural Environment and Rural Communities (NERC) Act 2006 Section 41 requirements. – Resident, or regularly occurring, populations of species that may be considered at an International/European (as detailed above), National or UK level including those receiving legal protection (listed within Schedules 1, 5 and 8 of the WCA) or listed for their principal importance for biodiversity or conservation status, where: – The loss of the population would adversely affect the conservation status or distribution of the species at this geographical stage; or – The population forms a critical part of a wider population at this scale; or

Importance	Criteria
	– The species is at a critical phase of its life cycle at this scale
Regional	Ecosystems and Habitats - Ecosystems or habitats essential for the maintenance of: – Populations of species of conservation concern within the region. Species: – Species whose presence contributes to the maintenance and restoration of biodiversity and ecosystems within the region. – Resident, or regularly occurring, populations of species that may be considered at an International, European, UK or National level (as detailed above), where: – The loss of the population would adversely affect the conservation status or distribution of the species at this geographical stage; or – The population forms a critical part of a wider population at this scale; or – The species is at a critical phase of its life cycle at this scale.
County	Ecosystems and Habitats - Ecosystems or habitats essential for the maintenance of: – Populations of species of conservation concern within the authority area. Species: – Species whose presence contributes to the maintenance and restoration of biodiversity and ecosystems within a relevant area such as Northumberland. – Resident, or regularly occurring, populations of species that may be considered at an International, European, UK or National level (as detailed above), where: – The loss of the population would adversely affect the conservation status or distribution of the species at this geographical stage; or – The population forms a critical part of a wider population at this scale; or – The species is at a critical phase of its life cycle at this scale.

Importance	Criteria
Local	Ecosystems and Habitats - Ecosystems or habitats essential for the maintenance of: – Populations of species of conservation concern within the local area (for example a Local Nature Reserve). Species: – Species whose presence contributes to the maintenance and restoration of biodiversity and ecosystems at a local level. – Resident, or regularly occurring, populations of species that may be considered at an International, European, UK or National level (as detailed above), where: – The loss of the population would adversely affect the conservation status or distribution of the species at this geographical stage; or – The population forms a critical part of a wider population at this scale; or – The species is at a critical phase of its life cycle at this scale.
Less than Local	Ecosystems or habitats that do not meet the above criteria, i.e. supporting at least populations of species of conservation concern within the local area

3.3. IMPACT ASSESSMENT

CHARACTERISATION OF POTENTIAL IMPACTS

3.3.1. CIEEM (**Ref. 7)** notes that impacts that are likely to be relevant in an assessment are those that are predicted to lead to significant effects (adverse or beneficial) on important ecological receptors. Significant effects are those that undermine the conservation status[2] of important ecological receptors. Knowledge and assessment of construction methods and operational activities, together with the ecological knowledge of ecologists with

2 Conservation status for habitats is determined by the sum of the influences acting on the habitat and its typical species that may affect its long-term distribution, structure and function as well as the long-term distribution and abundance of its population within a given geographical area. Conservation status for species is determined by the sum of influences acting on the species concerned that may affect the long-term distribution and abundance of its population within a given geographical area.

experience of similar large-scale infrastructure projects, has been used to identify the potential impacts of the project on ecological receptors.

3.3.2. Habitats and species that are considered to have a nature conservation importance of less than local are not considered important ecological receptors[3] in the context of this assessment. Any impact on such a feature as a result of Part B is considered unlikely to have a significant effect on the conservation status of such habitats or species on a local, regional, national or international scale. Therefore, features assessed to be of less than local nature conservation importance have been scoped out of the EcIA.

3.3.3. Characterisation of potential impacts has considered the processes that could lead to effects on ecological receptors, using the range of standard parameters from IAN 130/10 (**Ref. 8**), as well as others deemed appropriate (informed by CIEEM's Guidelines). These included whether the impact was positive (beneficial) or negative (adverse), the probability of the impact occurring (certain, probable, unlikely), its complexity (direct, indirect, cumulative), extent, size, duration, reversibility and timing/duration.

SIGNIFICANCE OF EFFECTS

3.3.4. Having characterised importance and potential impacts, proposals for mitigation and compensation have been considered, with the aim of avoiding, preventing, reducing or, if possible, offsetting any identified significant adverse effects. After the application of mitigation proposals, where significant effects are likely to occur, the overall significance of the effect has been assessed.

3.3.5. For the purpose of EcIA, 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' (explained in Technical Chapter 4 of CIEEM guidance (**Ref. 7**)) or for biodiversity in general. IAN 130/10 does not prescribe a method for determining the significance of ecological effects but does propose significant effect categories which are aligned with other topic areas in the DMRB. These are Neutral, Slight, Moderate, Large or Very Large (Table 3 of IAN 130/10) and are reproduced in **Table 3-2** below. In all instances, when determining the level of significance of the ecological effect, **Table 3-2** has been used as a guide in association with professional judgement (this is consistent with guidance in IAN 130/10). For example, an effect on an ecological receptor of county level importance could be considered Large if a particularly high proportion of the county resource were to be affected. To determine whether an effect is significant or not, CIEEM's Guidelines would also be considered (in lieu of comparable guidance in the DMRB).

[3] An ecological receptor is considered important based on many factors including its rarity, diversity, naturalness, context in the wider landscape, size and distribution as set out in A Nature Conservation Review (Ratcliffe, 1977).

Table 3-2 - Significance Categories of Effects on Ecological Receptors

Significance Category	Typical Descriptors of Effect (Nature Conservation)
Very Large	An impact on one or more receptor(s) of International, European, UK or National importance.
Large	An impact on one or more receptor(s) of Regional importance.
Moderate	An impact on one or more receptor(s) of County or Unitary Authority Area importance.
Slight	An impact on one or more receptor(s) of Local importance.
Neutral	No significant impacts on key nature conservation receptors.

3.4. MITIGATION

3.4.1. The principles of the mitigation hierarchy have been applied when considering potential impacts and subsequent effects on ecological receptors through the following sequential actions:

a. Avoidance;
b. Mitigation;
c. Compensation; and
d. Enhancement.

3.4.2. For the purpose of this assessment, mitigation refers to measures that are considered essential to avoid and reduce adverse impacts of Part B. Compensation refers to measures taken to offset the loss of, or permanent damage to, biological resources through the provision of replacement areas.

3.4.3. The mitigation measures described within this EcIA have been incorporated into the design and construction programme and taken into account in the assessment of residual effects. The mitigation prescribed aims to avoid or negate impacts on ecological receptors in accordance with best practice guidance and UK, English and local government environmental impact, planning and sustainability policies. These mitigation measures include those required to achieve the minimum standard of established good practice together with additional measures to further reduce any adverse impacts of Part B. The mitigation measures include those required to reduce or avoid the risk of committing legal offences.

3.4.4. Mitigation measures set out in this ES are captured in the **Outline Construction Environmental Management Plan** (**Outline CEMP**) (**Application Document Reference: TR010041/APP/7.3**) as environmental commitments to ensure implementation by the main

contractor. The Outline CEMP shall be used to inform a CEMP produced by the main contractor.

3.4.5. Impacts that are not significant (including those where compliance with regulation is required) would be expected to be avoided or reduced through the application of measures detailed within the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**), including best working practice (e.g. mitigation of potential pollution impacts through adherence to standard best practice and guidelines). Significant ecological impacts are expected to be mitigated through a combination of best practice and typical, proven mitigation methods along with mitigation targeted to specific locations as described in this assessment.

3.5. ASSUMPTIONS AND LIMITATIONS

3.5.1. The HSI methodology described was undertaken during surveys in 2016 (**Ref. 2**). The results from this survey have been reported within the current report as part of the desk study. Based on a full evaluation of the waterbodies and 2017 report it was decided that a presence / likely absence survey should be undertaken on all accessible water bodies identified within the Survey Area in the absence of eDNA testing.

3.5.2. A standardised methodology was used to conduct the surveys outlined in this report. However, access constraints prevented four water bodies from being surveyed for presence / likely absence within the 2018 survey period. Where this was the case, eDNA surveys were conducted in the 2019 survey period when access was granted. The temporal variation in the two survey periods is not considered to have negatively impacted the results of the survey or the overall conclusions in this report.

3.5.3. Access constraints prevented full presence / likely absence surveys from being undertaken at ponds B06, B07, B08 and B10 in 2018. Access was subsequently granted, and collection of eDNA from waterbodies B06, B08, B07 and B010 was able to be completed during April and June 2019. Two presence/likely absence survey visits were completed for ponds B06, B07 & B08 in April 2019 in anticipation of a positive eDNA result. As eDNA results returned negative for the presence of GCN further presence / likely absence surveys were not undertaken. This is not considered to have negatively impacted the results of the survey effort or impact assessment.

3.5.4. Nighttime temperatures during the first survey period on the week commencing 26th April 2018 dropped below 5°C, the minimum temperature appropriate to undertake bottle trapping surveys and the water level at pond B03 prevented effective netting, resulting in only two survey methods being used during this survey visit as opposed to the three survey methods required to conform to standard methodology. However, given the survey effort applied for the remainder off surveys confirmed to standard methods, and acknowledging the survey results of all surveys completed, this is not considered to have negatively affected the results, conclusions or assessment made in this report.

3.5.5. B02 dried out before the completion of four presence/absence survey visits. Only three of the four visits to this waterbody were completed. The drying out of this waterbody infers that the suitability to support GCN is significantly reduced. As such it is not considered that

this limitation has negatively affected the overall survey results, the assessment or conclusions of this report.

3.5.6. Pond B10 was not subject to presence/absence surveys and was instead assessed purely using HSI and eDNA. This waterbody was a small ditch that had been excavated the year previously, which frequently contained little to no water. The surrounding vegetation was heavily disturbed as a result of the excavation works and it was not possible to place bottle traps or net into the water due to its lack of depth. Whilst not subject to presence/absence survey, the results of the HSI and eDNA assessments indicated a reduced suitability to support GCN (eDNA assessment was negative for GCN). Waterbody B010 was therefore assessed to be unsuitable to support GCN by virtue of its character and negative eDNA result and presence/absence surveys were not considered required. Not undertaking presence/absence survey at pond B10 is not considered to have negatively affected the assessment or conclusions of this report.

4. RESULTS

4.1. DESK STUDY

4.1.1. The desk study returned 21 records of GCN within 2 km of the Order Limits. Records returned primarily centre round three specific locations with 19 records associated with Burgham Park Golf Course, Park Wood, and Tile Kiln Rush all dated from 2017. The remaining two records pertain to records from 2015.

4.1.2. All of the records recovered are located at the southernmost area of the Order Limits with the closest record located1.53 km from the Main Compound at Tile Kiln Rush.

4.1.3. No statutory designated sites with amphibians listed as a qualifying feature were returned during the desk study.

4.2. FIELD SURVEY

HSI ASSESSMENT AND ENVIRONMENTAL DNA RESULTS

4.2.1. HSI and eDNA results are presented in **Table 4-1**, with locations of subject to survey illustrated in **Figure 9.19: Pond Locations, Volume 6** of this ES (**Application Document Reference: TR010041/APP/6.6**). Full reports detailing the results and analysis of eDNA samples for the waterbodies surveyed are provided in **Appendix A** of this report.

Table 4-1 – HSI and eDNA Results

Pond Number	HSI Score	HSI Category	eDNA Results
B01	0.64	Average	N/A
B02	0.56	Below Average	N/A
B03	0.68	Average	N/A
B04	0.65	Average	N/A
B05	0.84	Excellent	N/A
B06	0.61	Average	Negative
B07	0.66	Average	Negative
B08	0.45	Poor	Negative
B09	0.79	Good	N/A
B010	0.36	Poor	Negative

PRESENCE/LIKELY ABSENCE SURVEY

4.2.2. No GCN were recorded during any of the four visits to ponds B01, B02, B03, B04, B05 and B09. Nor were any GCN recorded during the two visits to ponds B06, B07 and B08. Raw results, inclusive of dates, times, methodologies used, and weather conditions during surveys are provided in **Appendix B** of this report**.** It should be noted that while no GCN were recorded during the surveys, records of palmate newt *Lissotriton helveticus* and smooth newt *Lissotriton vulgaris* were made on several occasions.

5. NATURE CONSERVATION EVALUATION

5.1.1. No GCN or evidence of GCN were found; therefore, GCN are considered to be absent from the Order Limits and Survey Area. Whilst records were returned during the desk study, their distance from the Order Limits, lack of the species mobility to travel extensive distances through a landscape to colonise available habitat, and absence during surveys; GCN are scoped out from assessment.

6. POTENTIAL IMPACTS

6.1.1. There are no potential impacts to GCN as they are assessed as absent from the Survey Area.

7. MITIGATION

7.1.1. Owing to a lack of historic records within 2 km of the Part B Main Scheme Area, returns of negative eDNA results and no GCN recorded during any presence/absence surveys, GCN are assessed to be absent from the Survey Area. Therefore, no specific mitigation is recommended for GCN. Part B wide mitigation measures are defined within **Chapter 9: Biodiversity, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**).

8. RESIDUAL IMPACTS

8.1.1. There are currently no residual impacts anticipated as GCN have been assessed to be absent from the Survey Area.

8.1.2. In the unlikely event GCN are recorded during pre-construction surveys, the impact of Part B and any implementation of mitigation should take into account any potential for residual impacts upon GCN, post construction and during operation of Part B.

9. CONCLUSIONS

9.1.1. HSI and eDNA surveys were completed in 2016 (**Ref. 2**), the results of which helped to inform further survey effort during 2018 and subsequently 2019.

9.1.2. Six waterbodies (B01, B02, B03, B04, B05 & B09) were subject to presence/absence surveys during the 2018 survey period. Four visits were conducted as a minimum in accordance with best practice. No GCN were recorded during any of these surveys.

9.1.3. Of the remaining four waterbodies, three (B06, B07, and B08) were subject to two presence/absence visits, followed by eDNA testing, with pond B10 subject only to eDNA testing. Results subsequently ruled out presence of GCN in 2019 owing to negative eDNA results for all ponds and no GCN being recorded during the reduced presence/absence surveys of ponds B06, B07 and B08.

9.1.4. Given a lack of historical records, and negative results from both presence/absence surveys and eDNA assessment, GCN are assessed to be absent from the Survey Area and not a constraint to Part B. No bespoke mitigation measures are required to facilitate construction of Part B in respect of GCN.

REFERENCES

Ref. 1 – Jacobs (2018). A1 in Northumberland – B2104700/OD/264 – Extended Phase 1 Habitat Survey Report. Version 2, April 2018.

Ref. 2 – Jacobs (2017). A1 in Northumberland, B2104700/OD/261, Great Crested Newt Environmental DNA and Habitat Suitability Index Survey Report. Version 1.1, March 2018

Ref. 3 Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M. (2000). Evaluating the suitability of habitat for the great crested newt. Herpetological Journal 10, pp. 143-155.

Ref. 4 - Amphibian and Reptile Groups of the United Kingdom (2010). ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. ARG UK, UK.

Ref. 5 – English Nature (2001). Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.

Ref. 6 - Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, R.A., 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.

Ref. 7 – CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland. CIEEM, Winchester. Available at [https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-Sept-2019.pdf] Accessed: August 2019.

Ref. 8 - Design Manual for Roads & Bridges (2010) Interim Advice Note (IAN) 130/10 - Ecology and Nature Conservation: Criteria for Impact Assessment

Appendix A

EDNA RESULTS

18332-WS-LE-1 Order number: WSP-20-LE

Great Crested Newt eDNA Results

Company:	WSP
Address:	3 White Rose Office Park, Millshaw Park Lane, Leeds, LS11 0DL
Contact:	Lucy Elliot
Project code|Task code:	70044137 – A1 A2E
Date of Report:	19 July 2018
Number of samples:	1

Thank you for sending your sample for analysis by NatureMetrics. Your sample has been processed in accordance with the protocol set out in Appendix 5 of Biggs et al. (2014).

DNA was precipitated via centrifugation at 14,000 x g and then extracted using Qiagen Blood and Tissue extraction kits.

qPCR amplification was carried out in 12 replicates per sample, using the primers and probe described by Biggs et al. (2014), in the presence of both positive and negative controls.

Results indicate GCN absence in your sample. No degradation or inhibition was detected, and all controls performed as expected. Conclusive results are therefore presented.

Results are based on the samples as supplied by the client to the laboratory. Incorrect sampling methodology may affect the results. Note that a negative result does not preclude the presence of Great Crested Newts at a level below the limits of detection.

Sample	Pond ID	Date arrived	Inhibition	Degradation	eDNA score	GCN status
GCN18-1890	'B6'	03-Jul-18	No	No	0	Negative

End of report

Report issued by: Dr. Cuong Tang

Contact: ct@naturemetrics.co.uk | 01491 829042

Understanding your results

Positive: GCN DNA has been detected in this sample, meaning that at least one of the 12 replicates has amplified. Remember that this is not a quantitative test, so you should not interpret a high eDNA score (e.g. 12/12) as necessarily indicating a larger population of GCN than a low eDNA score (e.g. 1/12).

Negative: No GCN DNA has been detected in this sample, and the internal and external controls worked as expected. This tells us that if there had been GCN DNA in the sample, we would have detected it, so we can be confident in its absence from the sample provided.

Inconclusive: No GCN DNA was detected in the sample, but the internal controls failed to amplify as expected. This means that any GCN DNA in the sample might also have failed to amplify properly, so we cannot have confidence in this negative result. Inconclusive results can be caused by degradation of the DNA (when the DNA marker contained in the ethanol in the kits fails to amplify) or by inhibition of the reaction (when the marker added in the lab fails to amplify) caused by certain chemicals or organic compounds that may be present in the water sample.

Report: 19055-WSP-JF-1 Order number: WSP-19008-JF

Great Crested Newt eDNA Results

Company:	WSP Global Inc.
Contact:	Jack Fenwick
Project code|Task code:	A1 A2E - 70044137 | A1A2E - 2019 eDNA - A1A2E_2019_eDNA
Date of Report:	26 April 2019
Number of samples:	3

Thank you for sending your samples for analysis by NatureMetrics. Your samples have been processed in accordance with the protocol set out in Appendix 5 of Biggs et al. (2014).

DNA was precipitated via centrifugation at 14,000 x g and then extracted using Qiagen Blood and Tissue extraction kits.

qPCR amplification was carried out in 12 replicates per sample, using the primers and probe described by Biggs et al. (2014), in the presence of both positive and negative controls.

Results indicate GCN absence in 'Pond 6', 'Pond 7', and 'Pond 8'. All controls performed as expected and so the results are conclusive.

Results are based on the samples as supplied by the client to the laboratory. Incorrect sampling methodology may affect the results. Note that a negative result does not preclude the presence of Great Crested Newts at a level below the limits of detection.

Sample	Pond ID	Arrived	Inhibition	Degradation	Score	GCN status
422	'Pond 6'	18-Apr	No	No	0	Negative
423	'Pond 7'	18-Apr	No	No	0	Negative
421	'Pond 8'	18-Apr	No	No	0	Negative

End of report

Report issued by: Dr. Cuong Tang

Contact: ct@naturemetrics.co.uk | 01491 829042

Understanding your results

Positive: GCN DNA has been detected in this sample, meaning that at least one of the 12 replicates has amplified. Remember that this is not a quantitative test, so you should not interpret a high eDNA score (e.g. 12/12) as necessarily indicating a larger population of GCN than a low eDNA score (e.g. 1/12).

Negative: No GCN DNA has been detected in this sample, and the internal and external controls worked as expected. This tells us that if there had been GCN DNA in the sample, we would have detected it, so we can be confident in its absence from the sample provided. Samples marked as 'Negative after dilution' are those where inhibition was detected (when the marker added in the lab fails to amplify) but overcome by diluting the DNA. Inhibition can be caused by certain chemicals or organic compounds that may be present in the water sample.

Inconclusive: No GCN DNA was detected in the sample, but the internal controls failed to amplify as expected. This means that any GCN DNA in the sample might also have failed to amplify properly, so we cannot have confidence in this negative result. Inconclusive results can be caused by degradation of the DNA (when the DNA marker contained in the ethanol in the kits fails to amplify) or by inhibition of the reaction (when the marker added in the lab fails to amplify) caused by certain chemicals or organic compounds that may be present in the water sample.

Appendix B

RAW DATA

Date	GCN Detected	Eggs or Larvae Present	Air Temp (ºC)	Vegetation Cover (0-5)	Turbidity (0-5)	Other Amphibians Recorded		
						Smooth Newt	Palmate Newt	Common Toad
Pond Reference		**B01**						
26/04/2018	No	No	3	2	3	-	-	-
11/05/2018	No	No	5	2	2	-	-	-
17/05/18	No	No	8	2	3	-	-	-
29/05/2018	No	No	8	1	5	1	2	-
Pond Reference		**B02**						
26/04/2018	No	No	3	3	2	-	-	-
11/05/2018	No	No	5	3	3	-	-	-
17/05/18	No	No	8	0	4	-	-	-
29/05/2018	No	No	8	-	-	-	-	-
Pond Reference		**B03**						
26/04/2018	No	No	3	0.5	3	-	-	-
11/05/2018	No	No	5	0	2	-	-	-
17/05/18	No	No	8	0	4	-	-	-
29/05/2018	No	No	8	0	4	-	-	-
Pond Reference		**B04**						
26/04/2018	No	No	3	0.5	2	2	-	-
11/05/2018	No	No	5	0	4	-	-	-
17/05/18	No	No	8	0	4	-	-	-
29/05/2018	No	No	8	0	5	-	1	-
Pond Reference		**B05**						
26/04/2018	No	No	3	4	2	2	-	-
11/05/2018	No	No	5	5	2	-	-	-

Date	GCN Detected	Eggs or Larvae Present	Air Temp (ºC)	Vegetation Cover (0-5)	Turbidity (0-5)	Other Amphibians Recorded		
						Smooth Newt	Palmate Newt	Common Toad
17/05/18	No	No	8	5	2	-	-	-
29/05/2018	No	No	8	5	1	-	2	-
Pond Reference		**B06**						
08/04/2019	No	No	4	0	3	-	-	-
15/04/2019	No	No	7	1	1	-	-	-
Pond Reference		**B07**						
08/04/2019	No	No	4	3	2	-	-	-
15/04/2019	No	No	7	2	0	-	-	-
Pond Reference		**B08**						
08/04/2019	No	No	4	0	3	-	-	-
15/04/2019	No	No	7	0	1	-	-	-
Pond Reference		**B09**						
26/04/2018	No	No	3	2	1	5	-	-
11/05/2018	No	No	5	1	2	-	-	-
17/05/18	No	No	8	0	3	-	-	-
29/05/2018	No	No	8	1	5	-	2	-

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If you have any enquiries about this document A1inNorthumberland@highwaysengland.co.uk or call **0300 470 4580***.

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