A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010041

6.7 Environmental Statement – Appendix 9.5 Great Crested Newt Survey Report 2017

Part A

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

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A1 in Northumberland

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Great Crested Newt Survey Report

Version 2

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0	December 2017	Great Crested Newt Survey Report	Anatoli Togridou
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REVIEWER LIST

Name	Role
Andrew McIlwraith	Principal Ecologist

APPROVALS

Name	Signature	Title	Date of Issue	Version
Peter Farrer			April 2018	2

CONTENTS

EXECUTIVE SUMMARY

This technical report presents the findings of great crested newt (GCN) (*Triturus cristatus*) surveys undertaken by Jacobs UK Ltd. (Jacobs) on behalf of Highways England for the A1 in Northumberland project. Survey details herein this report relate to Section A Morpeth to Felton only.

The aim of the survey was to identify GCN presence in ponds within the survey area (500 m buffer of the proposals) relating to the A1 between Morpeth and Felton.

In May 2016 a desk-top study was requested from the local environmental records centre and local wildlife groups. Additionally, GCN Habitat Suitability Index (HSI) assessments and environmental DNA (eDNA) surveys for GCN were conducted in 2016. Based on the desk study and the results of the 2016 field surveys a number of ponds were identified that required further surveys to clarify GCN presence/absence in the survey area.

GCN presence/absence surveys were conducted between 3rd April 2017 and 5th June 2017 in line with standard methodology. As a result of these surveys four ponds were found to support GCN populations and were subject to further survey to determine a GCN population size class estimate.

The surveys revealed that three ponds (A12, A19 and A21) held a small GCN population size class, and one pond (A11) held a medium GCN population size class.

1 INTRODUCTION

1.1 Scheme Background

1.1.1 Following the outcomes of the 2014 A1 North of Newcastle Feasibility Study the Department of Transport confirmed, in its first Roads Investment Strategy, the intention to upgrade twenty-one kilometres of the existing A1 to a dual carriageway between Morpeth and Ellingham in Northumberland. This comprised two discreet sections:

- Section A - Morpeth to Felton, and;
- Section B - Alnwick to Ellingham.

1.1.2 At this stage of the project (PCF Stage 3) one option was under consideration for Section A, this is briefly described below:

Section A - Morpeth to Felton

- Offline Option – this option would be online at its north and south ends, but a large central section would form a new bypass to the west of the existing A1 between the Floodgate Burn crossing and Bockenfield Bridge. The existing A1 would be detrunked and form part of a local road network, which would separate local and strategic traffic.

1.2 Report Rationale

1.2.1 The aim of this report is to present great crested newt (GCN) (*Triturus cristatus*) survey information collated in 2017 by Jacobs on behalf of Highways England. This will include data on GCN presence/absence and GCN population size class estimates. In addition, a summary of previous GCN surveys undertaken in 2016 will be presented in this report.

1.2.2 Surveys undertaken in 2016 are reported in detail in the following report: B2104700/OD/261 - A1 in Northumberland, Amphibian Environmental DNA and Habitat Suitability Index Survey Report (Jacobs, March 2017).

1.2.3 The information presented will be used to identify the requirement for additional surveys to be completed at PCF Stage 3. The data will ultimately inform the Environmental Impact Assessment (EIA) for the preferred option.

1.3 Definitions

1.3.1 The study area relates to a 2 km buffer around the proposed option for Section A in which desk study information has been collated via online and third party sources.

1.3.2 The survey area refers to a 500 m buffer around the offline option for Section A.

1.4 Legislative and Regulatory Context

1.4.1 An assessment of the legislative and regulatory framework covering amphibians in the UK has been undertaken. Due consideration has been given to the following statutory instruments and policy frameworks in the preparation of this report:

- Conservation of Habitats and Species Regulations 2017[1];
- Wildlife and Countryside Act 1981 (as amended)[2] (WCA), and;

[1] https://www.legislation.gov.uk/uksi/2017/1012/contents/made

[2] http://www.legislation.gov.uk/ukpga/1981/69

- Natural Environment and Rural Communities Act 2006[3] (NERC).

1.4.2 In summary there are three species of amphibian fully protected under the combined measures contained in the Conservation of Habitats and Species Regulations 2017 and the WCA, these are: GCN, natterjack toad (*Epidalea calamita*) and pool frog (*Pelophylax lessonae*). Natterjack toad and pool frog have very restricted geographical ranges in the UK making it extremely unlikely that they would occur in the study area covered by this report. The study area falls within the known distribution of GCN and therefore this report focuses on the likely presence/absence of this species.

1.4.3 Appendix A of this report provides a brief synopsis of how the above frameworks relate to the protection of amphibians (including GCN) in the UK.

Nature Conservation Status

1.4.4 GCN are listed as Priority Species on the Northumberland Local Biodiversity Action Plan (LBAP)[4].

1.4.5 A study of GCN distribution in Northumberland was undertaken by Northumberland Wildlife Trust in 2006. The study shows a distribution in Northumberland concentrated within the large numbers of ponds in the eastern lowlands.

1.4.6 Current targets outlined in the Northumberland LBAP are the following:

- Maintain the current range of the Great Crested Newt in Northumberland of 41 sites by 2015, and;
- Increase the current range of the Great Crested Newt in Northumberland to 66 sites by 2015.

[3] http://www.legislation.gov.uk/ukpga/2006/16/pdfs/ukpga_20060016_en.pdf

[4] http://www.nwt.org.uk/sites/default/files/files/Great_Crested_Newt.pdf

2 METHODOLOGY

2.1 Desk Study

2.1.1 A desk study was undertaken in May 2016 with data requested from the Environmental Records Information Centre (ERIC) North East. At the time that the desktop study data were collated three options for Section A were under consideration. The desktop study data refers to a 2 km buffer of the three options.

2.2 Previous Survey Information

2.2.1 A total of 22 ponds (A1-A22) were identified in 2016 through the review of aerial imagery and OS maps of the survey area.

2.2.2 Where accessible GCN HSI assessments were undertaken in 2016 for each pond within 500 m of all proposed options (three in total). HSI assessments were undertaken between the 18th and 20th April 2016.

2.2.3 In addition, each accessible pond identified at that time was assessed for GCN presence or absence using environmental DNA (eDNA) sampling techniques.

2.2.4 The methodology followed for HSI assessments and eDNA sampling is presented in the following report: B2104700/OD/261 A1 in Northumberland, Amphibian Environmental DNA and Habitat Suitability Index Survey Report (Jacobs, March 2017).

2.2.5 Based on the results of the desk study and previous surveys undertaken in 2016 ponds were either scoped in or scoped out of further survey. This is discussed further in Section 3 of this report.

2.3 Presence/Absence and Population Size Class Estimate Surveys

2.3.1 All ponds scoped in for further survey (see Section 3 for details) were subject to GCN presence/absence and where necessary additional survey effort to determine a GCN population size class estimate.

2.3.2 Presence/absence and population size class estimate surveys were carried out by Jacobs ecologists between 3rd April and 6th June 2017. Initially the surveys comprised four survey visits to each pond, and two further survey visits were undertaken in the ponds where GCN were found to be present to estimate the population size class. Methodologies used are detailed below.

2.3.3 All surveys were undertaken during the optimal survey period for GCN surveys and followed best practice guidelines as set out in the Great Crested Newt Mitigation Guidelines (English Nature, 2001). The dates and weather conditions of each survey visit are presented in Appendix B.

2.3.4 Each survey visit incorporated three survey methods: bottle trapping, egg searching and torchlight searches. If one of these methods was deemed inappropriate, for example due to the physical conditions of the pond, then netting was used as the third survey method.

2.3.5 Bottle trapping involved setting traps made from two-litre plastic bottles around the margins of a pond in the early evening, and retrieving them the following morning. Traps were set at approximately 2 m intervals along all accessible margins. After identification, all amphibians and other fauna were released back into the pond they were captured from.

2.3.6 Torch counts involved surveyors walking around the perimeter of ponds at least one hour after sunset, using Clulite CB2 rechargeable torches with 1 million candlepower to search the margins for amphibians. Species were identified and the number of individuals was counted.

2.3.7 Egg searching involved a visual survey of marginal and submerged vegetation to identify the presence of newt eggs laid on leaves, which are folded over by a female newt to protect the egg. GCN eggs are readily identifiable in the field as they are approximately 5mm in diameter with a white or pale yellow embryo, whereas those of other UK newt species (such as smooth newt (*Lissotriton vulgaris*) and palmate newt (*Lissotriton helveticus*)) are approximately 3 mm in diameter with a greyish-white or brown embryo (Langton, Beckett & Foster, 2001). Egg searches were not continued in a pond after the presence of GCN eggs was identified, as unfolding leaves to identify eggs can lead to them being predated or rendering them unviable through exposure to ultraviolet radiation.

2.3.8 Netting techniques involved using a sturdy dip-net with a 2 mm mesh size and netting at the perimeter of the pond. Netting was undertaken for 15 minutes per 50m perimeter of pond, in line with standard protocols (English Nature, 2001). When caught, individuals were identified to species level, counted, and returned to the pond. This method is used to determine presence/absence of GCN and not population size class.

2.3.9 All surveys were carried out by Jacobs ecologists (Natural England licence numbers are listed in Table 1).

Table 1: Jacobs surveyors and Natural England GCN Licence numbers

Surveyor	Class Licence Registration Number
Anatoli Togridou	2015-15169-CLS-CLS
Fran Tobin	2016-23858-CLS-CLS
Catherine Burton	2015-18462-CLS-CLS
Greg Slack	2015-18073-CLS-CLS
Andy McIlwraith	2016-19523-CLS-CLS
Matthew Robson	2015-17390-CLS-CLS
Jean-Michelle Bellas	2015-17092-CLS-CLS
Stuart Anderson	2017-28585-CLS-CLS

2.3.10 Once GCN presence was established an additional two survey visits were undertaken to determine the GCN population size. Population size class was estimated using the criteria shown in Table 2 taken from the Great Crested Newt Mitigation Guidelines (English Nature, 2001), where the peak count of adult individuals on any given survey visit using either bottle trapping or torching methods indicates whether the population is ‘small’, ‘medium’ or ‘large’. Where there is reasonable certainty that there is regular interchange of GCN between ponds, (i.e. those that are within 250m of each other without a barrier and thus forming one meta-population), the peak count can be taken as the sum of all the ponds on any given survey night.

Table 2: Criteria for assessing population size class for GCN (English Nature, 2001)

Population Size Class	Peak count during any one survey visit		
	Small	Medium	Large
Maximum adult count per night by torchlight survey or bottle trapping	1-10	11-100	>100

2.4 Survey Limitations

2.4.1 The limitations shown in Table 3 below were encountered while surveying, which resulted in certain survey methods and ponds being excluded from this report:

Table 3: Limitations to the presence / absence and population size class estimate surveys.

Limitation	Description
Access restrictions	Land access to Pond A3 was granted for the first two survey visits only and then refused. There was no access to Pond A4 for undertaking GCN surveys. As Pond 3 was poor quality (see 'Polluted pond' section below), and Pond A4 was isolated and located within unsuitable terrestrial habitat (viewed from aerial photography), it can be inferred that GCN were unlikely to be present. Therefore, the limited access to these ponds is not considered to be a significant limitation.
Ephemeral ponds	Ponds A7, A9, A10 and A20a dried up part way through the survey period, limiting the number of surveys which could be undertaken. Pond A13 dried up prior to the beginning of the presence/absence surveys, so no surveys were undertaken at this pond. The ephemeral nature of these ponds suggests that they were unsuitable to support GCN. Therefore, the limited number of surveys is not considered to be a significant limitation.
Polluted pond	Pond A3 was heavily impacted through disturbance and water quality issues as pond was being used as a release area for wildfowl and game birds during the survey period. Given this and the access limitation described above this was deemed as a minimal limitation for the presence/absence surveys as this pond was considered to have a low potential to support GCN. Therefore this limitation is not significant.
Survey methodology	Ponds A2 and A9 were not suitable for bottle trapping during one or more of the surveys due to shallow water levels. In this case netting was employed in line with English Nature (2001) guidance, so this is not considered to be a significant limitation.

Limitation	Description
Weather Conditions	A survey visit to all ponds scoped in was attempted during w.c.24.04.17 – however an unexpected cold snap with temperatures significantly below 5^{o}C (i.e. snow) was experienced during this – therefore any survey data collected during this period would be invalid. In addition, this meant the GCN surveys did not strictly adhere to Nature England for presence/absence or population estimates where 2 to 3 surveys are required in the peak period mid-April to mid-May depending on whether GCN are recorded or not. All other surveys were conducted in suitable weather conditions in line with Natural England guidance. However, all surveys were undertaken within the active breeding period for GCN therefore survey data contained in this report should be considered sufficiently robust. In addition, given the northerly latitude of the survey area it is likely that the peak period of the active GCN breeding season is slightly later in the north. Based on these factors weather conditions are not considered to be a significant limitation to the survey.

2.4.2 The results within this report reflect the condition of ponds at the time of survey. GCN can disperse large distances overland to colonise new aquatic and terrestrial habitats. Therefore, colonisation of new areas is possible within a relatively short timescale. Consequently, if the construction of the proposed development is delayed for an extended period of time, the survey results would be less reliable and the surveys may need to be repeated.

2.4.3 The findings of this report represent the professional opinion of qualified ecologists and do not constitute professional legal advice. The client may wish to seek professional legal interpretation of the relevant wildlife legislation cited in this document.

3 BASELINE

3.1 Desk Study

3.1.1 Data received from ERIC North East identified that there were three records of common toad (*Bufo bufo*), four records of common frog (*Rana temporaria*) and five records of GCN. Records were dated between 1983 and 2015 within the 2 km study area for Section A. The desk study records are presented on Figure 1. GCN records are concentrated around Burgham Park Golf Course in the Section A study area.

3.1.2 The desk study identified a Natural England European protected species licence (EPSL) application relating to GCN within 2 km of the proposed options for Section A at Burgham Park Golf Course. The licence number was EPSM2013-6209 and related to damage of a resting place. The licence start date was 12/12/2013 and the end date was 30/06/2019. The location of the European Protected Species Licence (EPSL) was at grid reference NZ 16897 96903 (as shown in Figure 1).

3.2 Previous Survey

3.2.1 The results from the GCN HSI assessments and eDNA sampling undertaken in 2016 are summarised in Table 4 below.

3.2.2 Some ponds were scoped out for reasons described in Table 4 below. The HSI results are presented in Appendix C, and are shown on Figures 2.1 to 2.5.

3.2.3 The eDNA test results were received from Nature Metrics on 21st May 2016, and the results are shown in Table 4 below. The eDNA lab report is presented in Appendix D, and the results are illustrated on Figures 2.1 to 2.5.

3.2.4 The results of the above surveys are presented in detail in the A1 in Northumberland, B2104700/OD/261 Amphibian Environmental DNA and Habitat Suitability Index Survey Report (Jacobs, March 2017).

Table 4: Summary of ponds surveyed in 2016 (HSI and eDNA surveys) and 2017 (presence/absence and population size estimate surveys)[5]

Pond number	HSI result	eDNA result	Further surveys recommended or scoped out
A1	0.57 (below average)	N/A	Scoped out, outside 250 m buffer
A2	0.54 (below average)	N/A	Presence/absence
A3	0.79 (good)	Negative	Presence/absence (access denied after two visits)
A4	0.63 (average)	N/A	No access

[5] It should be noted that the pond numbering from the laboratory eDNA results are not the same as the pond numbers shown on the results figures. Numbering of the laboratory samples were ordered sequentially for Jacobs purposes and based on the known ponds at the time of sampling.

Pond number	HSI result	eDNA result	Further surveys recommended or scoped out
A5	0.63 (average)	Negative	Presence/absence
A6	0.41 (poor)	N/A	Presence/absence
A7	0.79 (good)	N/A	Presence/absence
A8	0.63 (average)	Negative	Scoped out, outside 250 m buffer and separated from the proposed off-line route by the existing A1 carriageway.
A9	0.52 (below average)	Negative	Presence/absence
A10	0.59 (below average)	Negative	Presence/absence
A11	0.74 (good)	Negative	Presence/absence, population size estimate
A12	0.70 (good)	Negative	Presence/absence, population size estimate
A13	0.58 below average	Negative	Dry
A14	0.73 (good)	N/A	Presence/absence
A15	0.44 (poor)	Negative	Scoped out, unsuitable to support GCN due to poor HSI score and nature of pond; wildfowl were prevalent and pond appeared to be stocked with fish

Pond number	HSI result	eDNA result	Further surveys recommended or scoped out
A16	0.51 (below average)	Negative	Scoped out, outside 250 m buffer
A17	0.90 (excellent)	Negative	Presence/absence
A18	0.53 (below average)	N/A	Presence/absence
A19	0.89 (excellent)	Negative	Presence/absence, population size estimate
A20a	N/A	N/A	Found in 2017, presence/ absence
A20b	0.81 (excellent)	Negative	Presence/absence
A21	0.74 (good)	Positive	Presence/absence, population size estimate
A22	0.48 (poor)	Negative	Scoped out, outside 250 m buffer

3.2.5 Based on the desk study records, HSI assessments and eDNA sampling it was recommended that ponds would be subject to GCN presence / absence surveys and where required, population size class estimate survey unless otherwise scoped out (See Table 3 and Table 4 for details). In brief, this would include ponds all ponds within 250 m of the proposed scheme . Additionally, ponds were scoped in to further survey that were between 250 m - 500 m from the proposals that were not separated by a major barrier (i.e. major rivers or roads), had a HSI score above 0.7 (Good) and / or possess historic records of GCN.

3.3 Presence/Absence and Population Size Class Estimate

16 ponds identified within 500 m of the offline option were subject to presence/absence and, where needed, population size class estimate surveys. Seven of the 22 ponds subject to HSI and eDNA surveys in 2016 were not surveyed in 2017, due to the reasons summarised in Table 4 in Section 3.2 above. One additional pond (20b) was found in 2017 and was surveyed. The detailed survey results are provided in Appendix E.

3.3.1 Table 5 below summarises the number of surveys undertaken in Section A and the maximum count of GCN found.

Table 5: Summary of GCN presence/absence and population size class estimate surveys (Y=GCN found, N=GCN not found during the survey)

Pond	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6	GCN found	Max count	GCN Population class
A2	N	N	N	N	N/A	N/A	N	N/A	N/A
A3	N	N	No access				N	N/A	N/A
A4	No access						N/A	N/A	N/A
A5	N	N	N	N	N/A	N/A	N	N/A	N/A
A6	N	N	N	N	N/A	N/A	N	N/A	N/A
A7	N	Dried up					N	N/A	N/A
A9	N	N	N	Dried up			N	N/A	N/A
A10	N	N	N	Dried up			N	N/A	N/A
A11	Y	Y	Y	Y	Y	Y	Y	16	Medium
A12	N	N	Y	N	N	Y	Y	1	Low
A13	Dried up						N/A	N/A	N/A
A14	N	N	N	N	N/A	N/A	N	N/A	N/A
A17	N	N	N	N	N/A	N/A	N	N/A	N/A
A18	N	N	N	N	N/A	N/A	N	N/A	N/A
A19	Y	Y	Y	Y	N	N	Y	4	Low
A20a	N	Dried up					N	N/A	N/A
A20b	N	N	N	N	N/A	N/A	N	N/A	N/A
A21	N	Y	N	N	N	N	Y	1[6]	Low

3.3.2 Two incidental sightings of GCN were recorded in proximity of Pond A19 within terrestrial habitat; one female GCN was observed moving away from the pond on 4 July 2017, and a further three female GCN were observed near the pond on 5 July 2017.

3.3.3 All three newt species (GCN, palmate and smooth) were recorded in three ponds; A11, A19 and A21. Palmate newts were found in a total of ten ponds in relatively high numbers.

[6] An immature GCN; no adult GCN were recorded.

3.3.4 Common toads and common frogs were recorded in several of the ponds during the presence / absence surveys; common toads were observed in Ponds A6, A12, A17, A18 and A19, and common frogs were observed in Ponds A9, A14, A17, A18 and A21.

3.3.5 Figures 3.1 to 3.5 show the results of the presence/absence and population size surveys.

3.3.6 Photos of the surveyed ponds are presented in Appendix F.

4 SUMMARY

4.1.1 The surveys completed by Jacobs in 2017 found GCN presence in four ponds, Ponds A11, A12, A19 and A21. Although no GCN eggs were found within these ponds, Pond A11 contained a medium population of GCN so it can be assumed that this pond featured a breeding population. These surveys resulted in a population size class estimate of 'small' population size class in three ponds (Ponds A12, A19 and A21), and a 'medium' population size in one pond (Pond A11). No GCN were recorded elsewhere in the survey area.

4.1.2 GCN were present in two small clusters of ponds[7]; Ponds A20a, A20b and A21 formed a cluster at the north of the survey area, and Ponds A11 and A12 formed a disparate cluster (within 200 m of each other) at the approximate mid-point of the scheme. The population within Pond A19 is likely to be isolated as the nearest ponds were over 500 m away. The majority of the ponds where no GCN were found were isolated and spread out across the survey area, so dispersal of GCN from the populated ponds is unlikely.

4.1.3 The ponds that contained populations of GCN, and ponds that featured at least four native amphibian species (Ponds A17, A18, A19 and A21) may meet the Local Wildlife Site selection criteria for Northumberland[8].

4.1.4 The data presented in this report reflect the status of ponds at the time of survey (April to June 2017). GCN can disperse large distances overland to colonise new aquatic and terrestrial habitats, therefore colonisation of new areas is possible within a short timescale. Consequently, if the construction of the scheme is delayed for an extended period of time (e.g. more than two years), the survey results would be less reliable and the surveys may need to be repeated.

4.1.5 Mitigation strategies are dependent upon the specific significance of the construction impact (i.e. pond loss or temporary damage to intermediate terrestrial habitat). The Ecology Chapter of the Environmental Statement (ES) will present full details of the potential impacts on the species associated with the proposed scheme and suitable mitigation measures if required.

[7] Clusters are based on assumption that GCN will generally disperse up to 250m between ponds (Langton et al. 2001).

[8] https://www.nwt.org.uk/sites/northumberland.live.wt.precedenthost.co.uk/files/files/LWS%20Selection%20Criteria%20Guidelines.pdf

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6 FIGURES

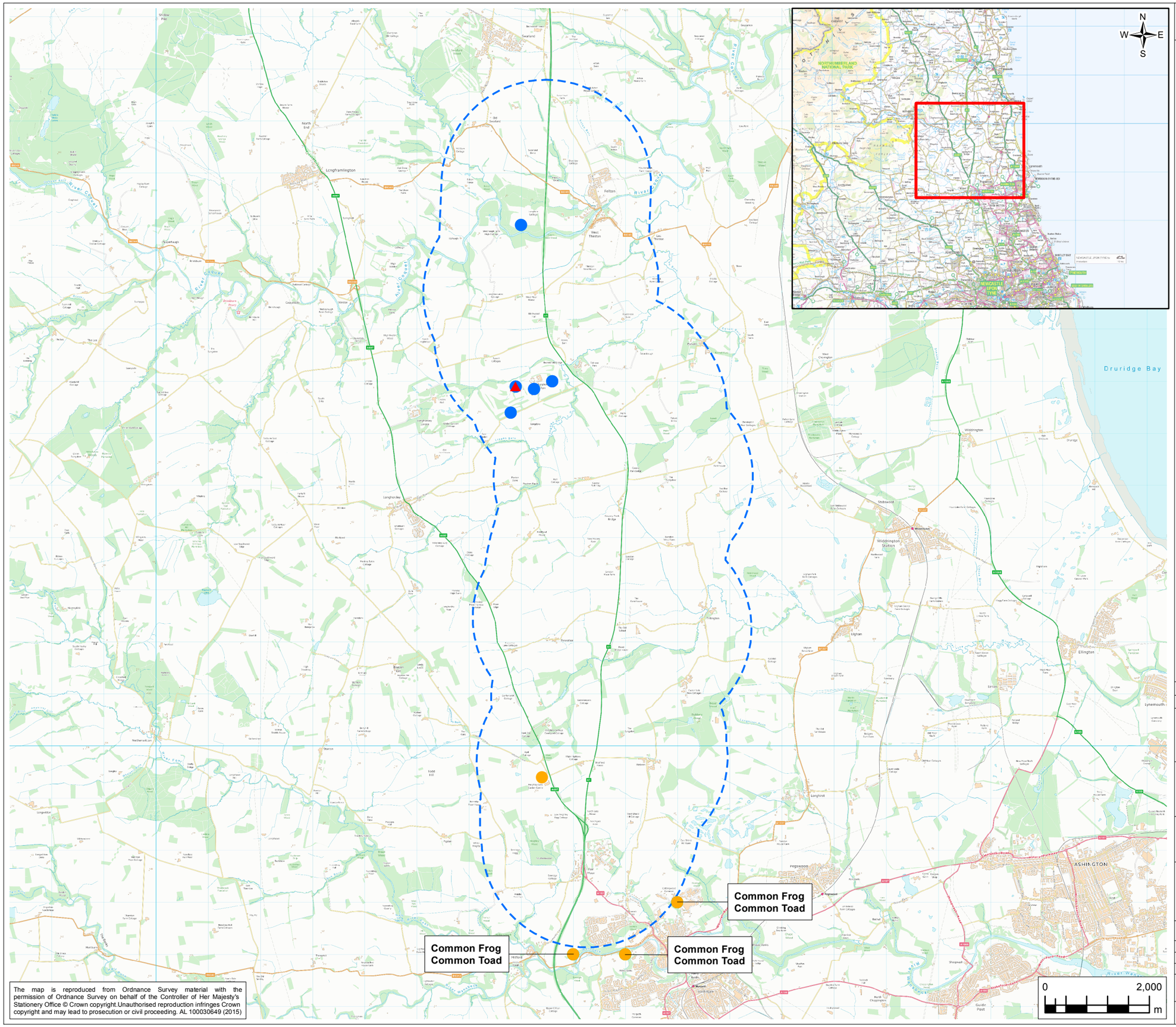

FIGURE 1

Legend

2km Buffer (all options combined)

Key

- Common Frog
- Common Toad
- Great Crested Newt
- GCN European Protected Species Licence (EPSL)

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	NOV 17	Initial Issue	LT	IM	AM	PF

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Client: highways england

Project: A1 IN NORTHUMBERLAND

Drawing Title: SECTION A - MORPETH TO FELTON
SPECIES RECORDS
AMPHIBIANS

Drawing Status:

Scale @ A3	1:70,000	DO NOT SCALE
Jacobs No.	B2104701	
Client No.		

Drawing No.: B2104701_EC_GCN_01

FIGURE 2.1

Legend

- 250m Survey Area
- 500m Survey Area
- Sheet Extents (sheet number)

01

02

03

04

N
W E
S

0 2,000 m

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	NOV 17	Initial Issue	LT	IM	AM	PF

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Project: A1 IN NORTHUMBERLAND

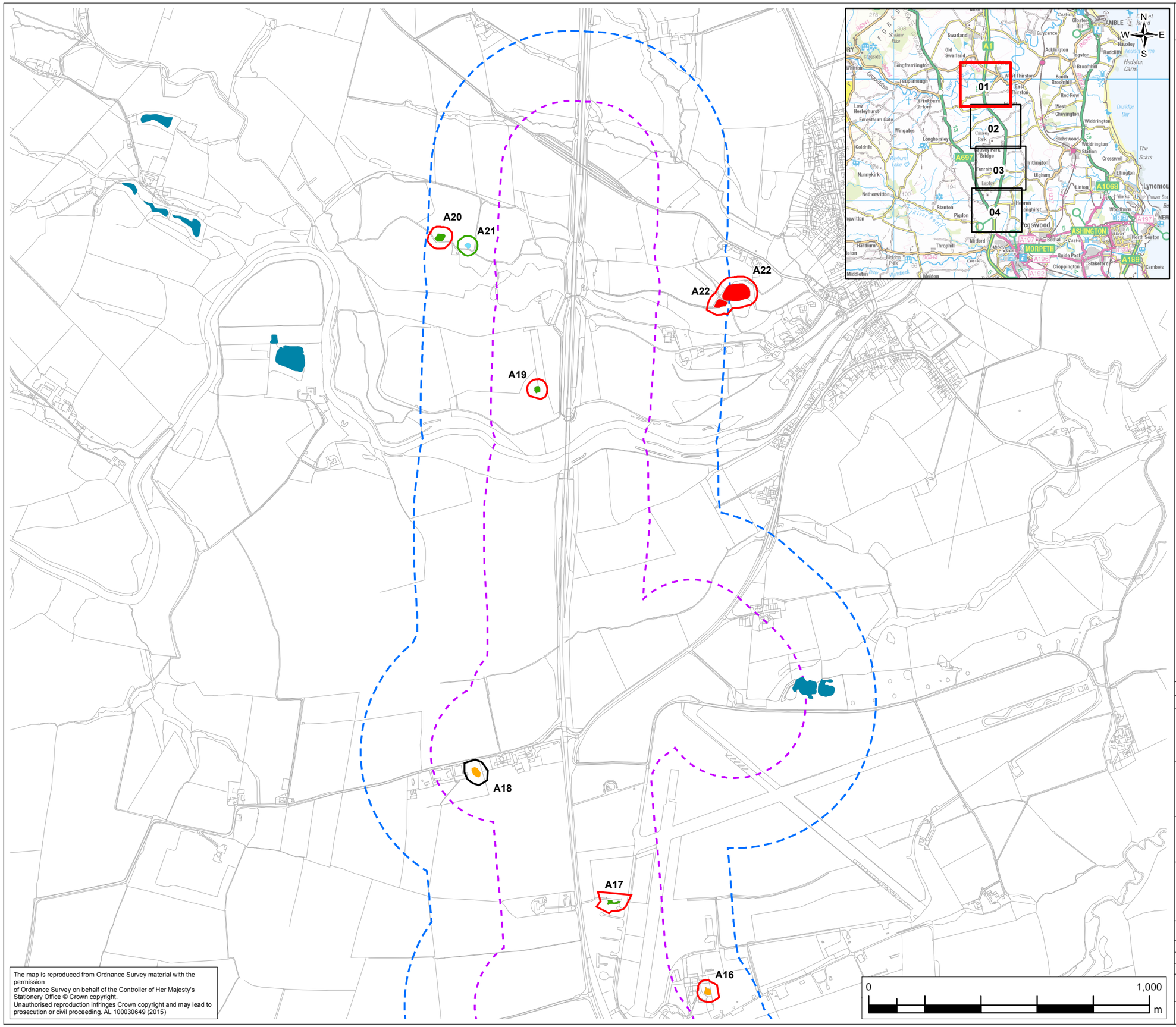
Drawing Title: SECTION A - MORPETH TO FELTON
GREAT CRESTED NEWT SURVEY
FIGURE OVERVIEW

Drawing Status:

Scale @ A3	1:55,000	DO NOT SCALE
Jacobs No.	B2104701	
Client No.		

Drawing No.: B2104701_EC_GCN_0201

FIGURE 2.2



Legend

- 250m Survey Area
- 500m Survey Area
- Waterbody (not surveyed)

HSI Scores

- Excellent
- Good
- Average
- Below Average
- Poor

eDNA Results

- Positive eDNA
- Negative eDNA
- Not surveyed for eDNA

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	NOV 17	Initial Issue	LT	IM	AM	PF

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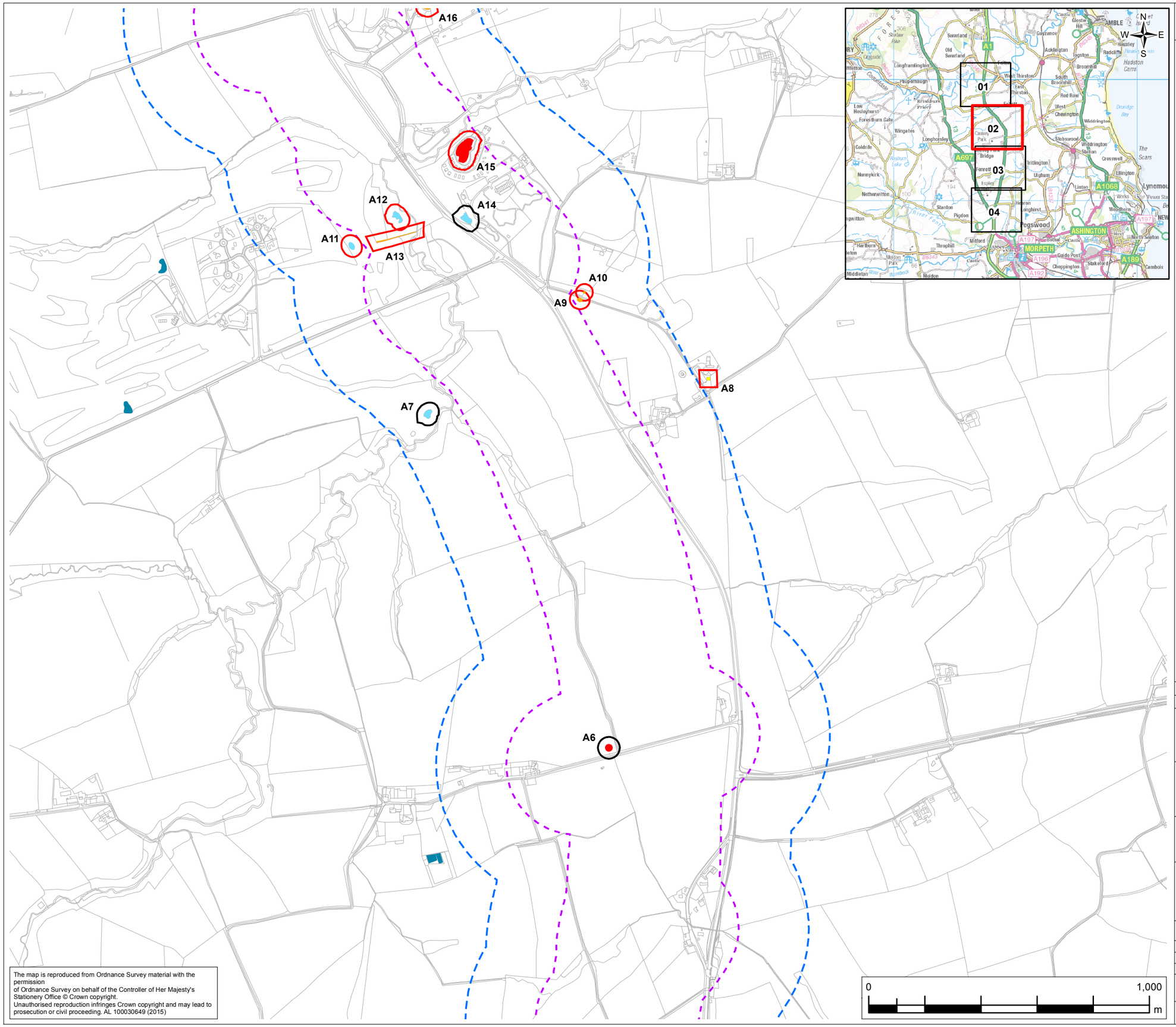
GREAT CRESTED NEWT HSI AND eDNA SURVEY RESULTS

Drawing Status:

Scale @ A3	1:13,000	DO NOT SCALE
Jacobs No.	B2104701	
Client No.		

Drawing No.: B2104701_EC_GCN_0202

FIGURE 2.3



Legend

- 250m Survey Area
- 500m Survey Area
- Waterbody (not surveyed)

HSI Scores

- Excellent
- Good
- Average
- Below Average
- Poor

eDNA Results

- Positive eDNA
- Negative eDNA
- Not surveyed for eDNA

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	NOV 17	Initial Issue	LT	IM	AM	PF

JACOBS
1 City Walk, Leeds, LS11 9DX, UK.
Tel: +44(0)113 242 6771 Fax:+44(0)113 389 1389
www.jacobs.com

Client: highways england

Project: A1 IN NORTHUMBERLAND

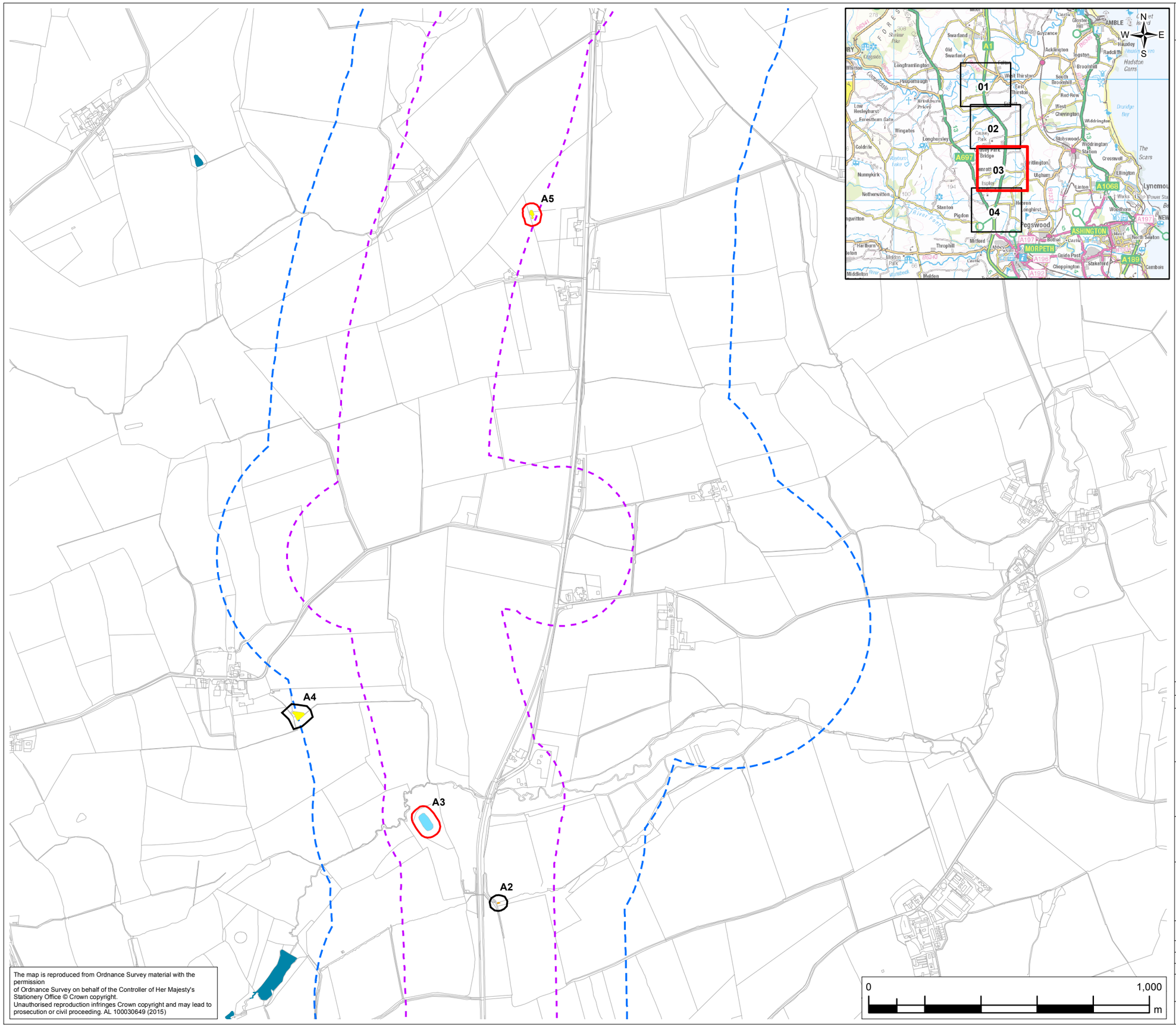
Drawing Title: SECTION A - MORPETH TO FELTON
GREAT CRESTED NEWT HSI AND eDNA SURVEY RESULTS

Drawing Status:

Scale @ A3	1:13,000	DO NOT SCALE
Jacobs No.	B2104701	
Client No.		

Drawing No.: B2104701_EC_GCN_0203

FIGURE 2.4



Legend

- 250m Survey Area
- 500m Survey Area
- Waterbody (not surveyed)

HSI Scores

- Excellent
- Good
- Average
- Below Average
- Poor

eDNA Results

- Positive eDNA
- Negative eDNA
- Not surveyed for eDNA

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	NOV 17	Initial Issue	LT	IM	AM	PF

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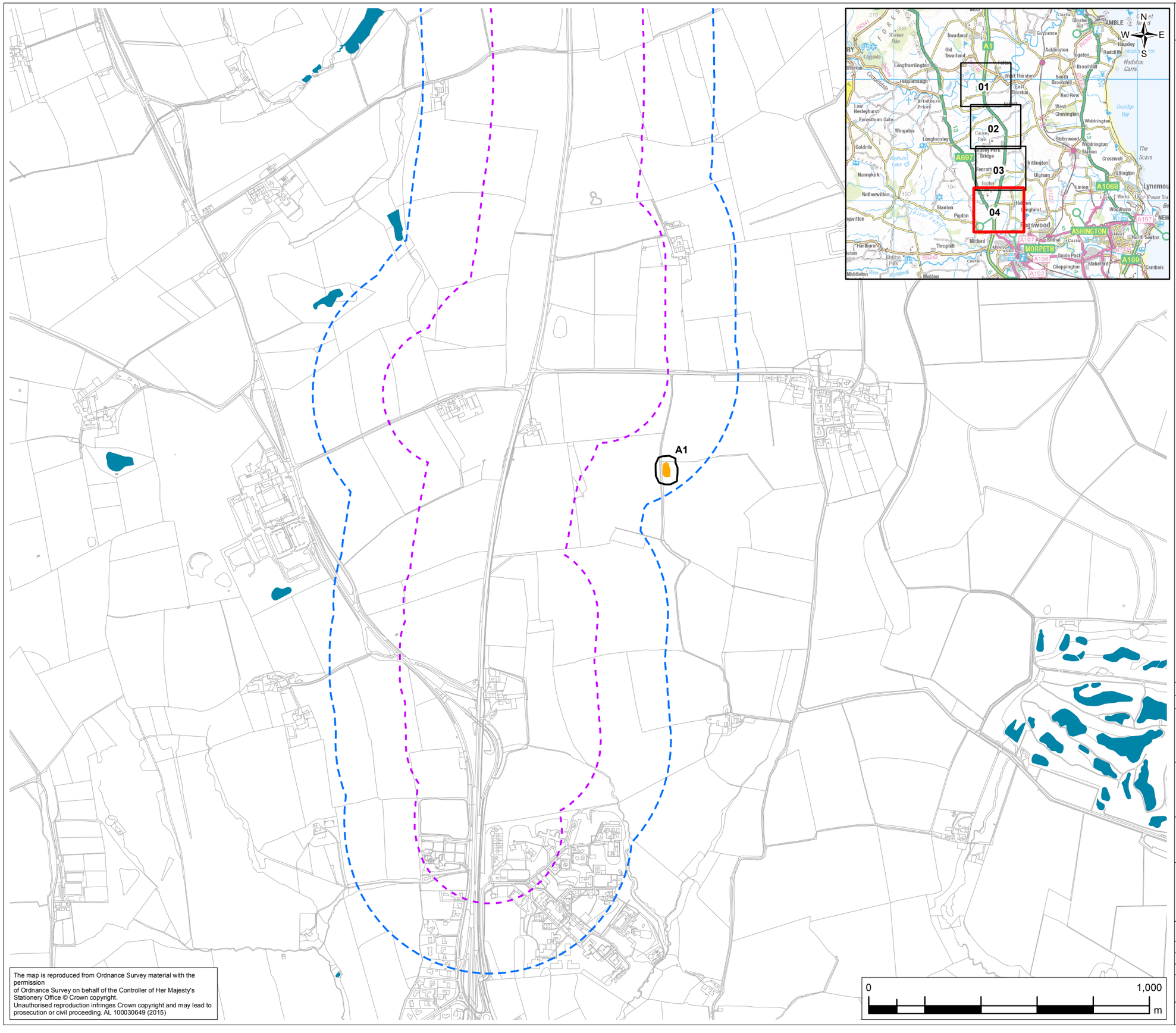
GREAT CRESTED NEWT HSI AND eDNA SURVEY RESULTS

Drawing Status

Scale @ A3	1:13,000	DO NOT SCALE
Jacobs No.	B2104701	
Client No.		

Drawing No.: B2104701_EC_GCN_0204

FIGURE 2.5



Legend

- 250m Survey Area
- 500m Survey Area
- Waterbody (not surveyed)

HSI Scores

- Excellent
- Good
- Average
- Below Average
- Poor

eDNA Results

- Positive eDNA
- Negative eDNA
- Not surveyed for eDNA

0 1,000 m

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	NOV 17	Initial Issue	LT	IM	AM	PF

JACOBS
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Tel: +44(0)113 242 6771 Fax:+44(0)113 389 1389
www.jacobs.com

Client: highways england

Project: A1 IN NORTHUMBERLAND

Drawing Title: SECTION A - MORPETH TO FELTON
GREAT CRESTED NEWT HSI AND eDNA SURVEY RESULTS

Drawing Status:

Scale @ A3	1:13,000	DO NOT SCALE
Jacobs No.	B2104701	
Client No.		

Drawing No. B2104701_EC_GCN_0205

FIGURE 3.1

Legend

- 250m Survey Area
- 500m Survey Area
- Sheet Extents (sheet number)

01
02
03
04

N
W
E
S

0 2,000 m

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	NOV 17	Initial Issue	LT	IM	AM	PF

JACOBS
1 City Walk, Leeds, LS11 9DX, UK.
Tel: +44(0)113 242 6771 Fax:+44(0)113 389 1389
www.jacobs.com

Client: highways england

Project: A1 IN NORTHUMBERLAND

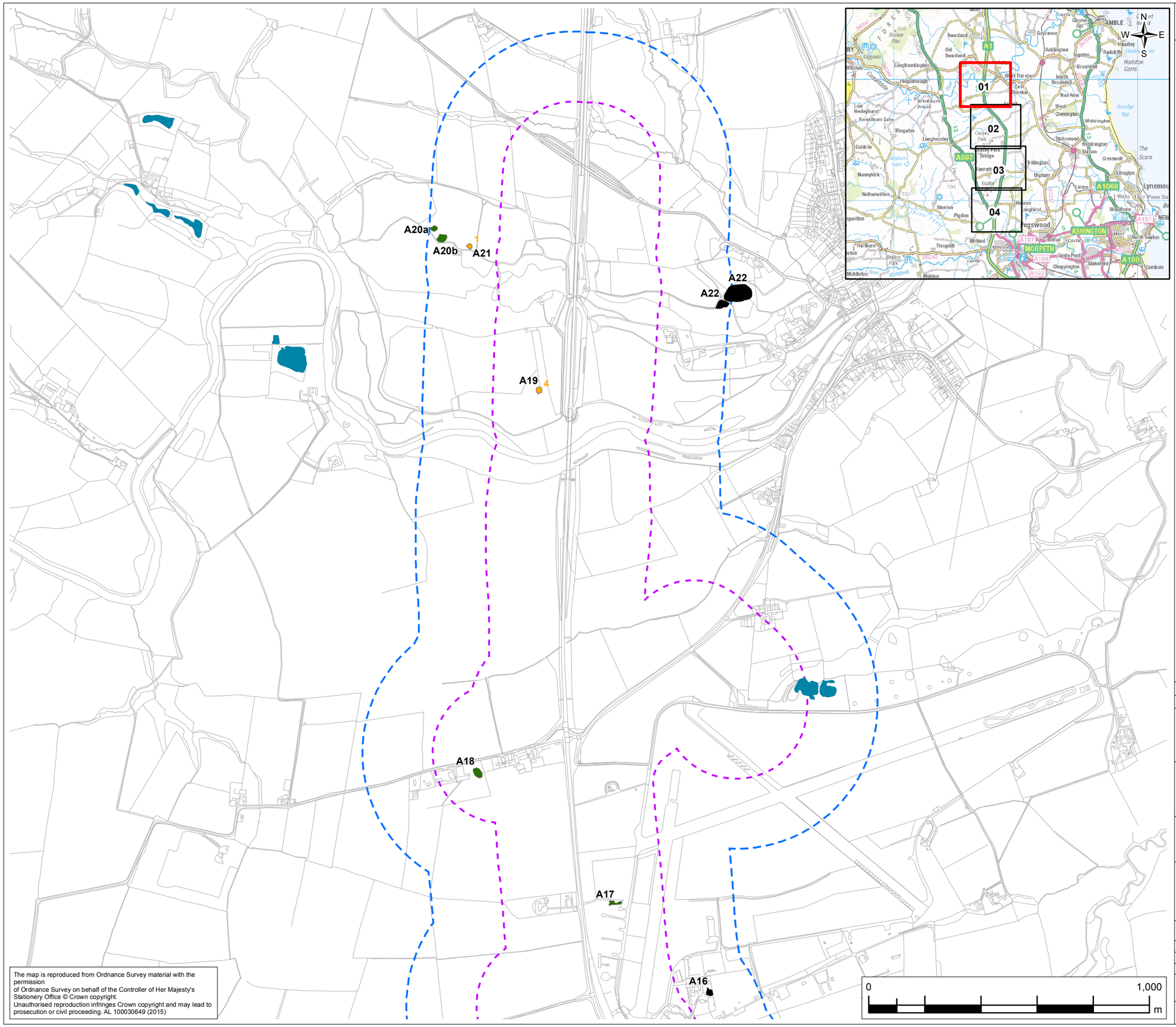
Drawing Title: SECTION A - MORPETH TO FELTON
GREAT CRESTED NEWTS SURVEY
FIGURE OVERVIEW

Drawing Status:

Scale @ A3	1:55,000	DO NOT SCALE
Jacobs No.	B2104701	
Client No.		

Drawing No.: B2104701_EC_GCN_0301

FIGURE 3.2



Legend

- 250m Buffer from Offline Option
- 500m Buffer from Offline Option
- Waterbody

GCN Population Size Class

- GCN Absent
- Low - 1 to 10
- Medium - 11 to 100
- Pond Access Refused
- Pond Scoped Out

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	NOV 17	Initial Issue	LT	IM	AM	PF

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1 City Walk, Leeds, LS11 9DX, UK.
Tel: +44(0)113 242 6771 Fax:+44(0)113 389 1389
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Client: highways england

Project: A1 IN NORTHUMBERLAND

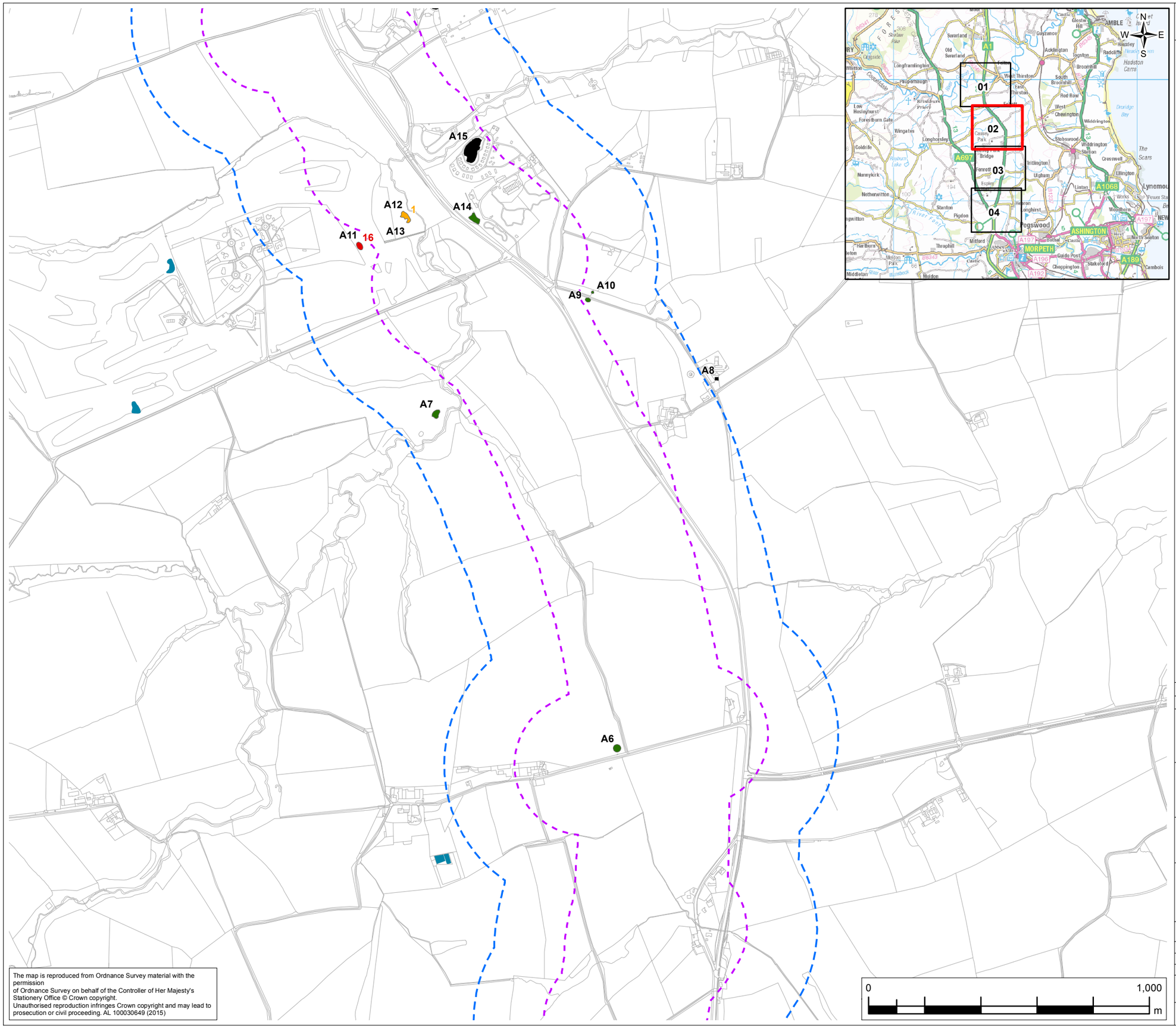
Drawing Title: SECTION A - MORPETH TO FELTON
GREAT CRESTED NEWT
SURVEY RESULTS

Drawing Status:

Scale @ A3	1:13,000	DO NOT SCALE
Jacobs No.	B2104701	
Client No.		

Drawing No.: B2104701_EC_GCN_0302

FIGURE 3.3



Legend

- 250m Buffer from Offline Option
- 500m Buffer from Offline Option
- Waterbody

GCN Population Size Class

- GCN Absent
- Low - 1 to 10
- Medium - 11 to 100
- Pond Access Refused
- Pond Scoped Out

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	NOV 17	Initial Issue	LT	IM	AM	PF

JACOBS
1 City Walk, Leeds, LS11 9DX, UK.
Tel: +44(0)113 242 6771 Fax:+44(0)113 389 1389
www.jacobs.com

Client: highways england

Project: A1 IN NORTHUMBERLAND

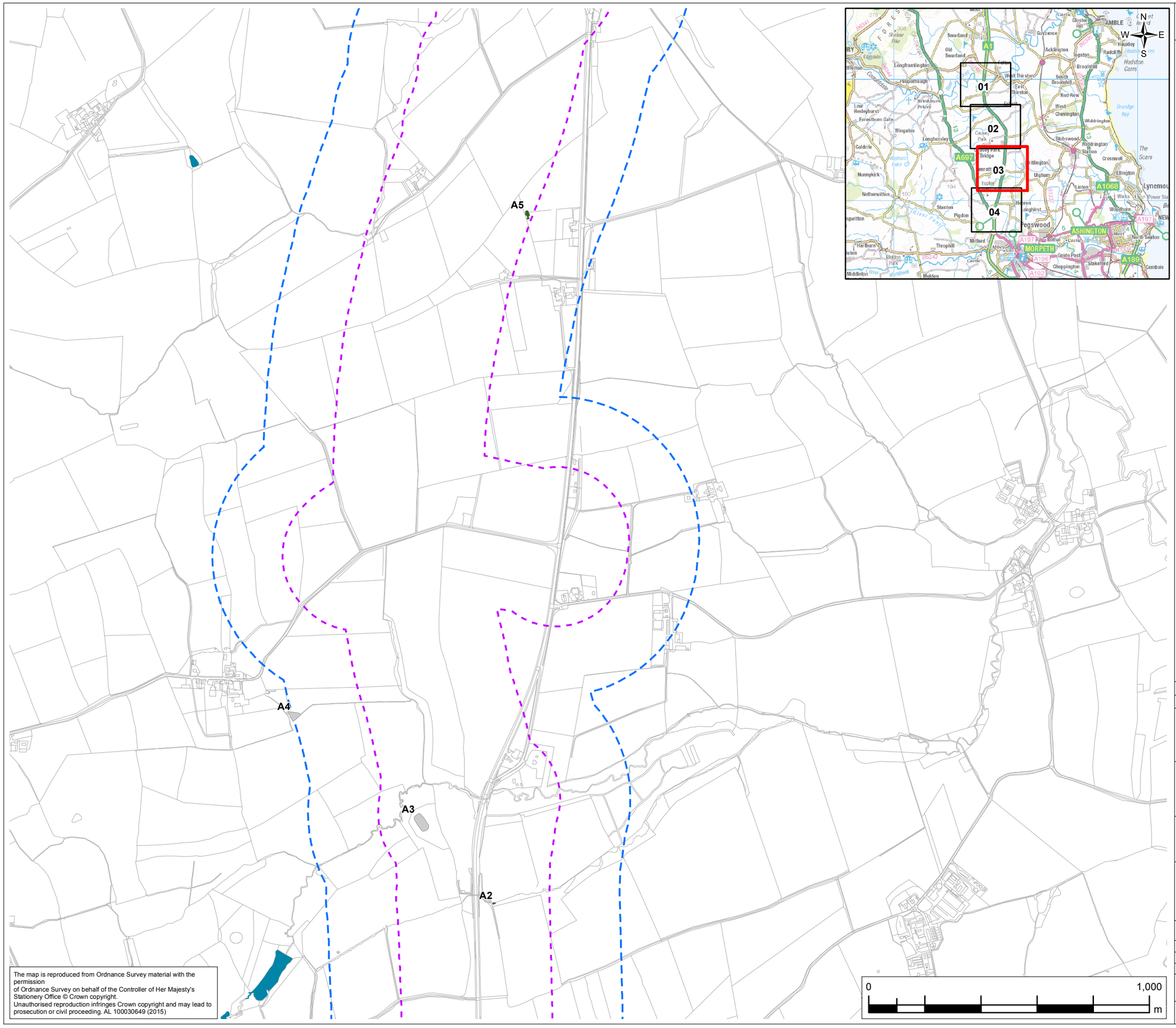
Drawing Title: SECTION A - MORPETH TO FELTON
GREAT CRESTED NEWT
SURVEY RESULTS

Drawing Status:

Scale @ A3	1:13,000	DO NOT SCALE
Jacobs No.	B2104701	
Client No.		

Drawing No.: B2104701_EC_GCN_0303

FIGURE 3.4



Legend

- 250m Buffer from Offline Option
- 500m Buffer from Offline Option
- Waterbody

GCN Population Size Class

- GCN Absent
- Low - 1 to 10
- Medium - 11 to 100
- Pond Access Refused
- Pond Scoped Out

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	NOV 17	Initial Issue	LT	IM	AM	PF

JACOBS
1 City Walk, Leeds, LS11 9DX, UK.
Tel: +44(0)113 242 6771 Fax:+44(0)113 389 1389
www.jacobs.com

Client: highways england

Project: A1 IN NORTHUMBERLAND

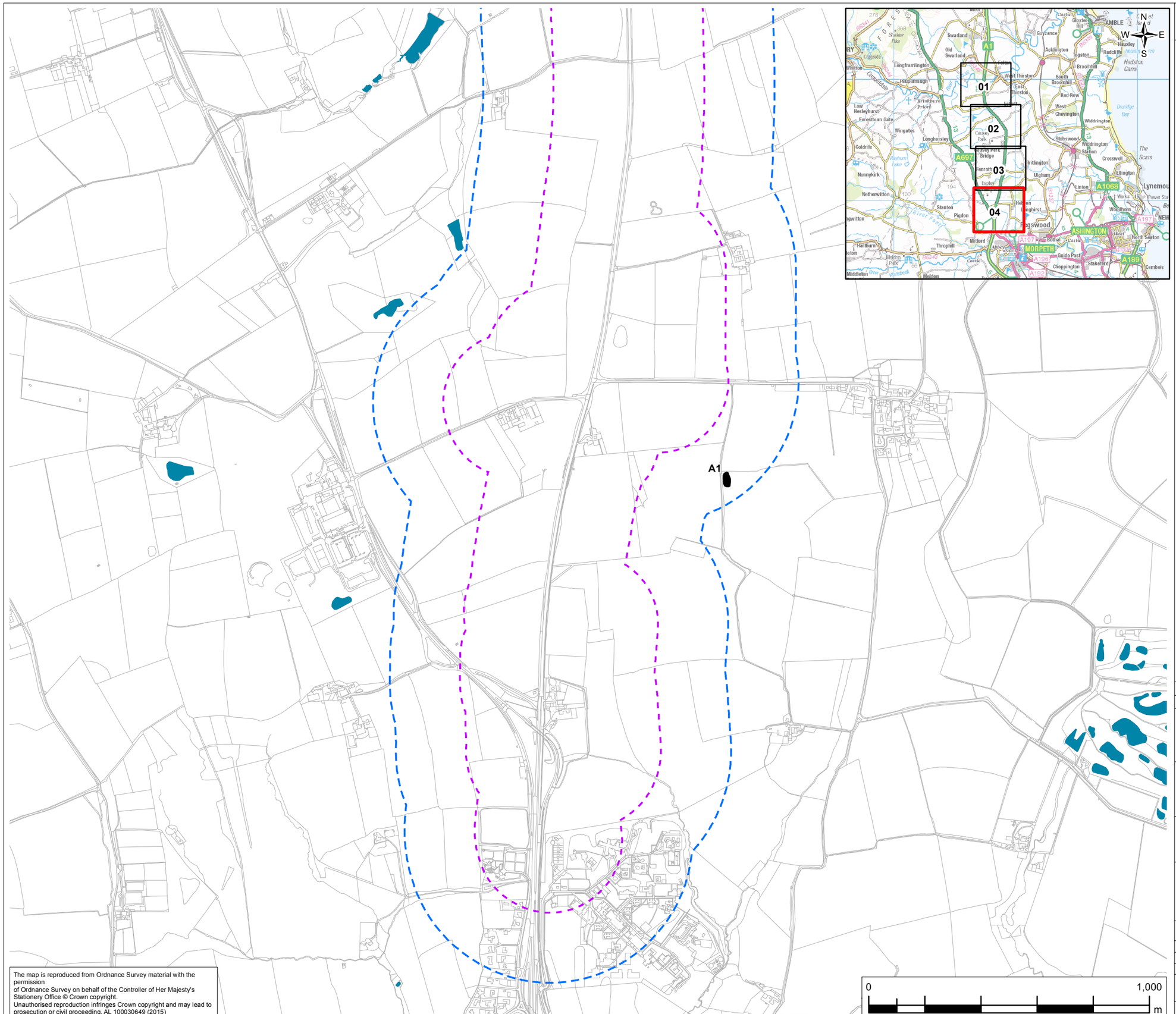
Drawing Title: SECTION A - MORPETH TO FELTON
GREAT CRESTED NEWT
SURVEY RESULTS

Drawing Status

Scale @ A3	1:13,000	DO NOT SCALE
Jacobs No.	B2104701	
Client No.		

Drawing No.: B2104701_EC_GCN_0304

FIGURE 3.5



Legend

- 250m Buffer from Offline Option
- 500m Buffer from Offline Option
- Waterbody

GCN Population Size Class

- GCN Absent
- Low - 1 to 10
- Medium - 11 to 100
- Pond Access Refused
- Pond Scoped Out

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	NOV 17	Initial Issue	LT	IM	AM	PF

JACOBS
1 City Walk, Leeds, LS11 9DX, UK.
Tel: +44(0)113 242 6771 Fax:+44(0)113 389 1389
www.jacobs.com

Client: highways england

Project: A1 IN NORTHUMBERLAND

Drawing Title: SECTION A - MORPETH TO FELTON
GREAT CRESTED NEWT PRESENCE/ABSENCE AND
POPULATION SIZE ESTIMATE SURVEY RESULTS

Drawing Status

Scale @ A3	1:13,000	DO NOT SCALE
Jacobs No.	B2104701	
Client No.		

Drawing No. B2104701_EC_GCN_0305

APPENDIX A - LEGISLATIVE AND PLANNING CONTEXT

The Conservation of Habitat and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act 1981 (as amended)

Great crested newts (GCN) are fully protected under The Conservation of Habitats and Species Regulations 2017 (henceforth referred to as the Habitats Regulations or Regulations) and the Wildlife and Countryside Act 1981 (as amended) (henceforth referred to as the WCA).

The Habitats Regulations transpose Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into UK law. The Regulations provide for the designation and protection of 'European Sites', the protection of 'European Protected Species' (EPS), and the adaptation of planning and other controls for the protection of European Sites. EPS are listed on Schedule 2 of the Conservation Regulations.

Under the combined measures included in the Habitats Regulations and WCA and the it is an offence to:

- deliberately capture, injure or kill any wild animal listed as an EPS;
- deliberately disturb wild animals of any such species in such a way as to be likely to impair their ability:
    - to survive, to breed or reproduce, or to rear or nurture their young; or
    - in the case of animals of a hibernating or migratory species, to hibernate or migrate;
- to affect significantly the local distribution or abundance of the species to which they belong;
- deliberately take or destroy the eggs of such an animal; or
- damage or destroy a breeding site or resting place of such an animal.

Natural Environment and Rural Communities Act 2006 (NERC 2006)

Section 40 of the Act concerns biodiversity and states: "*Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity*."

Section 41 of the NERC Act sates that: "*The Secretary of State must, as respects England, publish a list of the living organisms and types of habitat which in the Secretary of State's opinion are of principal importance for the purpose of conserving biodiversity*". Common toad, natterjack toad, pool frog and GCN have been listed as 'Species of Principal Importance' under the NERC Act. The list of species can be downloaded from the natural England website at:

http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx

The Act stresses that "*it is important that public authorities seek not only to protect important habitats and species, but actively seek opportunities to enhance biodiversity through development proposals, where appropriate. Incorporating enhancement opportunities into projects may help applicants to achieve planning permission*."

Northumberland Biodiversity Action Plan (BAP)

GCN are included on the Northumberland BAP[9]. Surveys undertaken by Northumberland Wildlife Trust in 2006 showed a concentrated distribution of GCN within the large numbers of ponds in the eastern lowlands. The BAP includes a Species Action Plan listing priority actions for GCN. The two main targets were to:

- Maintain the current range of GCN in Northumberland of 41 sites by 2015; and
- Increase the current range of GCN in Northumberland to 66 sites by 2015.

[9] http://www.nwt.org.uk/sites/default/files/files/Great_Crested_Newt.pdf

APPENDIX B – SURVEY DATES AND WEATHER CONDITIONS

Table B1: Weather conditions recorded during presence/absence and population size estimation survey visits

Pond No.	Visit No.	Date	Night Air temp. (°C)	Turbidity	Veg. cover %
A2	1	04/04/17	9	moderate	20
	2	08/05/17	7.6	moderate	20
	3	22/05/17	15	moderate	20
	4	01/06/17	16	low	20
A3	1	04/04/17	9	high	0
	2	08/05/17	11	low	0
A5	1	03/04/17	9	high	5
	2	08/05/17	6	high	5
	3	22/05/17	14	high	95
	4	01/06/17	13	high	95
A6	1	04/04/17	9	low	20
	2	08/05/17	6	high	20
	3	22/05/17	14	low	25
	4	30/05/17	10	low	20
A7	1	03/04/17	8	moderate	0
	2	09/05/17	10	dry	
	3	22/05/17	15	dry	
	4	30/05/17	10	dry	
A9	1	03/04/17	14	clear	80
	2	09/05/17	13	clear	80
	3	22/05/17	14	clear	95
	4	31/05/17	11	dry	
A10	1	03/04/17	14	low	5

Pond No.	Visit No.	Date	Night Air temp. (°C)	Turbidity	Veg. cover %
	2	09/05/17	11	low	3
	3	22/05/17	14	low	5
	4	31/05/17	11	dry	
A11	1	03/04/17	8	clear	60
	2	09/05/17	6	clear	60
	3	18/05/17	12	low	60
	4	22/05/17	14	clear	60
	5	30/05/17	9	clear	60
	6	06/06/17	11.4	clear	80
A12	1	04/04/17	9	low	20
	2	08/05/17	8	moderate	20
	3	22/05/17	14	low	20
	4	30/05/17	15	clear	30
	5	06/06/17	11.3	clear	40
	6	13/06/17	10	clear	25
A14	1	03/04/17	14	high	20
	2	08/05/17	8	moderate	20
	3	23/05/17	15	moderate	20
	4	31/05/17	11	low	20
A17	1	04/04/17	10	clear	20
	2	09/05/17	9	clear	20
	3	23/05/17	14	clear	70
	4	01/06/17	15	clear	70
A18	1	04/04/17	10	clear	90
	2	09/05/17	5	high	90
	3	23/05/17	12	clear	90

Pond No.	Visit No.	Date	Night Air temp. (°C)	Turbidity	Veg. cover %
	4	31/05/17	11	high	90
A19	1	03/04/17	10	low	40
	2	09/05/17	8	moderate	60
	3	18/05/17	12	moderate	70
	4	23/05/17	15	low	80
	5	31/05/17	10	low	80
	6	07/06/17	12.2	low	80
A20a	1	03/04/17	10	clear	50
	2	09/05/17	11	dry	
	3	23/05/17	14	dry	
	4	31/05/17	10	dry	
A20b	1	03/04/17	10	clear	70
	2	09/05/17	11	low	60
	3	23/05/17	14	high	65
	4	31/05/17	10	moderate	70
A21	1	03/04/17	10	clear	60
	2	09/05/17	11	low	100
	3	18/05/17	12	low	90
	4	23/05/17	14	high	90
	5	31/05/17	10	low	90
	6	07/06/17	12.2	low	90

APPENDIX C - HSI RESULTS AND POND DESCRIPTIONS

Table C1: HSI Survey Results – Section A

Pond #	HSI score	Habitat suitability	Pond description	Grid reference
A1	0.57	Below Average	Pond approximately 10 m x 15 m in size. Surrounded by rank grassland. Aquatic marginal vegetation was absent. A defunct hedge of gorse (*Ulex sp.)* and hawthorn (*Crataegus monogyna*) bordered the pond.	NZ 18874 89427
A2	0.54	Below Average	Small pond located at the end of a watercourse. Habitat suitability evaluated from aerial photography due to access restrictions.	NZ 18579 91256
A3	0.79	Good	The pond appeared to be man-made. The pond was silty with tadpoles present. Pond did not appear to be linked to the nearby watercourse.	NZ 18342 91548
A4	0.63	Average	Large pond with no shading and a hedgerow margin. Habitat suitability evaluated from aerial photography due to access restrictions.	NZ 17888 91920
A5	0.63	Average	Pond was in a field and appeared to be man-made.	NZ 18718 93714
A6	0.41	Poor	Man-made pond next to motocross track. No macrophytes present and no shade. Fish possibly present. Waterfowl present; two mallard *(Anas platyrhynchos*).	NZ 18581 95238
A7	0.79	Good	Equestrian eventing pond with jumps. Pond was not shaded. There were no macrophytes, fish or wildfowl present. Moderate water quality from field run off.	NZ 17945 96410
A8	0.63	Average	Brick built, steep sided reservoir with outfall. Water quality was poor. The waterbody was rain fed and quite deep. Not suitable for bottle trapping due to steep sides.	NZ 18943 96534
A9	0.52	Below Average	Waterbody was a ditch with standing water. Waterbody was on the edge of woodland.	NZ 18457 96835

Pond #	HSI score	Habitat suitability	Pond description	Grid reference
A10	0.59	Below Average	Waterbody was a settled ditch with no flow. Within woodland	NZ 18479 96848
A11	0.74	Good	Pond is within golf course. Pond may completely dry sometimes. There were two dry ponds immediately to the north west.	NZ 17649 97025
A12	0.70	Good	Tadpoles present in pond. Pond is fed from land drain and is very silty. Wildfowl present and fish presence possible. Surrounding terrestrial habitat is moderate for GCN.	NZ 17834 97104
A13	0.58	Below average	Small pond above A15, banks steep and very muddy. Wildfowl present. May be dangerous for surveyors to enter to bottle trap.	NZ 18083 97099
A14	0.73	Good	Small isolated pond with species-poor marginal vegetation and no apparent aquatic vegetation. The southern section of the pond had a large area of locally dominant common reed (*Phragmities* sp.). No tadpoles were observed at the time of survey though newts (species unknown) and frogs (*Rana temporaria*) have been observed according to the campsite owner's son.	NZ 18074 97116
A15	0.44	Poor	Pond is within holiday park; numerous wildfowl and fishing stations were present.	NZ 18064 97353
A16	0.51	Below Average	Pond was in garden of house, south east of an airfield. Pond formed by leaking septic tank. Bad water quality. Surveyors advised not to enter.	NZ 17937 97867
A17	0.90	Excellent	Moderate water quality. Waterfowl and fish absent, surrounding terrestrial habitat is good.	NZ 17593 98179
A18	0.53	Below Average	Small pond, heavily dominated by water crowfoot (*Ranunculus aquatilis)* soft rush *(Juncus effusus)* at margins and green algae (Species unknown) also present. Pond was approximately 7 m in diameter. The surrounding terrestrial habitat was good for GCN. The pond was not shaded but had moderately	NZ 17099 98657

Pond #	HSI score	Habitat suitability	Pond description	Grid reference
			good water quality and no signs of fish or wild fowl.	
A19	0.89	Excellent	Pond was approximately 25 m x 30 m in size. Tadpoles and aquatic invertebrates were present. Wild fowl and fish absent. Abundant emergent vegetation included species such as bulrush (*Typha sp.)*, floating sweet grass (*Glyceria fluitans*) and rushes (*Juncus* sp.*)* with willow scrub (*Salix* sp.*)* at pond margins. Surrounding terrestrial woodland habitat was good for GCN.	NU 17328 00008
A20	0.81	Excellent	Algae present. Pond had very shallow margins, with deep silt. The northern part of the pond was shallow and in this area approximately 30 % was inundated with bulrush	NU 16932 00575
A21	0.74	Good	Small pond approximately 8 m x 10 m with side flowering rushes to margins and abundant duckweed (*Lemna minor).* In line with a water channel that flows from west to east and a wet channel that links to pond A22 and flows west to east.	NU 17083 00523
A22	0.48	Poor	Pond had a pinched figure of 8 shape. There were lots of aquatic invertebrates present. Wide and deep margins on northern side; the small part of the pond is to the west. Moorhen (*Gallinula chloropus*), Canada goose (*Branta Canadensis*) and 100+ mallard were present.	NU 18049 00359

APPENDIX D – ENVIRONMENTAL DNA LABORATORY REPORTS

NatureMetrics
DNA based monitoring

Report: 16049-Jac28AM-2

Great Crested Newt eDNA Results

Company:	Jacobs UK
Address:	1 City Walk, Leeds, LS11 9DX
Contact:	Andy McIlwraith
Project No:	B2104700
Date of Report:	21 May 2016
Number of samples:	9

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 14,000g 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 presence in 1 sample (GCN000846 – A8) and GCN absence in all other samples. No DNA degradation or PCR inhibition was detected in any sample, and all controls performed as expected.

eDNA score gives the number of replicates (out of 12) that tested positive for GCN. This should not be interpreted as a measure of population size. Note that a negative result does not preclude the presence of Great Crested Newts at a level below the limits of detection.

NatureMetrics
DNA based monitoring

Sample	Pond ID	Date arrived	GCN Status	eDNA Score	Inhibition	Degradation
GCN000853	A1	25/04/2016	Negative	0/12	No	No
GCN000838	A2	25/04/2016	Negative	0/12	No	No
GCN000852	A3	25/04/2016	Negative	0/12	No	No
GCN000831	A4	25/04/2016	Negative	0/12	No	No
GCN000847	A5	25/04/2016	Negative	0/12	No	No
GCN000833	A6	25/04/2016	Negative	0/12	No	No
GCN000848	A7	25/04/2016	Negative	0/12	No	No
GCN000846	A8	25/04/2016	Positive	1/12	No	No
GCN000849	A9	25/04/2016	Negative	0/12	No	No
GCN000834	A10	25/04/2016	Negative	0/12	No	No
GCN000861	A11	25/04/2016	Negative	0/12	No	No
GCN000845	A12	25/04/2016	Negative	0/12	No	No
GCN000854	A13	25/04/2016	Negative	0/12	No	No
GCN000842	A14	25/04/2016	Negative	0/12	No	No
GCN000844	A15	25/04/2016	Negative	0/12	No	No
GCN000843	B2	25/04/2016	Negative	0/12	No	No
GCN000860	B3	25/04/2016	Negative	0/12	No	No
GCN000840	B4	25/04/2016	Negative	0/12	No	No
GCN000857	B5	25/04/2016	Negative	0/12	No	No
GCN000856	B6	25/04/2016	Negative	0/12	No	No
GCN000830	B7	25/04/2016	Negative	0/12	No	No
GCN000839	B8	25/04/2016	Negative	0/12	No	No

APPENDIX E – PRESENCE/ABSENCE AND POPULATION SIZE ESTIMATE SURVEY RESULTS

Table E1: The number of amphibian individuals or eggs identified during Visit 1 (presence/absence surveys)

Visit 1							
Pond No.	Great Crested Newt (F: female, M: male, I: immature, U: unknown)				Smooth/Palmate Newt (total count)	Common toad	Common frog
	Torch	Bottle traps	Netting	Egg search			
A2	0	N/A	0	0	0	0	0
A3	0	0	N/A	0	0	0	0
A5	0	0	N/A	0	0	0	0
A6	0	0	N/A	0	0	0	0
A7	0	0	N/A	0	0	0	0
A9	0	N/A	0	0	0	0	1
A10	0	0	N/A	0	4 smooth, 3 palmate newt	0	0
A11	10M, 1F, 3U	5M, 1F	N/A	0	36 smooth, 2 palmate newts	0	0
A12	0	0	N/A	0	0	17	0
A14	0	0	N/A	0	3 smooth, 1 palmate newt	0	3
A17	0	0	N/A	0	5 smooth, 1 palmate newt	1	1
A18	0	0	N/A	0	0	2	1
A19	4M	1F	N/A	0	34 smooth, 38 palmate newts	1	0
A20a	0	0	N/A	0	0	0	0
A20b	0	0	N/A	0	2 smooth, 19 palmate newts	0	0
A21	0	0	N/A	0	10 smooth, 37 palmate newts	0	1

Table E2: The number of amphibian individuals or eggs identified during Visit 2 (presence/absence surveys)

Visit 2							
Pond No.	**Great Crested Newt (F: female, M: male, I: immature, U: unknown)**				**Smooth/Palmate Newt (total count)**	**Common toad**	**Common frog**
	Torch	**Bottle traps**	**Netting**	**Egg search**			
A2	0	N/A	0	0	0	0	0
A3	0	N/A	N/A	N/A	0	0	0
A5	0	0	N/A	0	0	0	0
A6	0	0	N/A	0	0	2	0
A7	Dry						
A9	0	N/A	N/A	0	0	0	0
A10	0	0	N/A	0	1 smooth newt	0	0
A11	1M	8M, 8F	N/A	0	1 smooth, 5 palmate newts	0	0
A12	0	0	N/A	0	0	0	0
A14	0	0	N/A	0	0	0	0
A17	0	0	N/A	0	6 palmate newts	0	0
A18	0	0	N/A	0	0	0	0
A19	0	2M, 1F	N/A	0	6 smooth, 39 palmate newts	0	0
A20a	0	0	N/A	0	0	0	0
A20b	0	0	N/A	0	8 smooth, 6 palmate newts	0	0
A21	1I	0	N/A	0	12 palmate newts	0	0

Table E3: The number of amphibian individuals or eggs identified during Visit 3 (presence/absence surveys)

Visit 3							
Pond No.	**Great Crested Newt (F: female, M: male, I: immature, U: unknown)**				**Smooth/Palmate Newt (total count)**	**Common toad**	**Common frog**
	Torch	**Bottle traps**	**Netting**	**Egg search**			
A2	0	N/A	0	0	0	0	0
A3	No access						
A5	0	0	N/A	0	0	0	0
A6	0	0	N/A	0	0	0	0
A7	Dry						
A9	0	0	N/A	0	1 palmate newt	0	0
A10	0	0	N/A	0	1 palmate newt	0	0
A11	2M	4M, 3F	N/A	0	20 smooth, 4 palmate newts	0	0
A12	0	1M	N/A	0	4 palmate newts	1	0
A14	0	0	N/A	0	1 smooth newt	0	0
A17	0	0	N/A	0	0	0	0
A18	0	0	N/A	0	2 smooth, 1 palmate newt		
A19	2F	1M, 3F	N/A	0	64 smooth, 18 palmate newts	0	0
A20a	Dry						
A20b	0	0	N/A	0	5 palmate newts	0	0
A21	0	0	N/A	0	1 smooth, 17 palmate newts	0	0

Table E4: The number of amphibian individuals or eggs identified during Visit 4 (presence/absence surveys)

Visit 4							
Pond No.	**Great Crested Newt (F: female, M: male, I: immature, U: unknown)**				**Smooth/Palmate Newt (total count)**	**Common toad**	**Common frog**
	Torch	**Bottle traps**	**Netting**	**Egg search**			
A2	0	N/A	0	0	0	0	0
A3	No access						
A5	0	0	N/A	0	0	0	0
A6	0	0	N/A	0	0	0	0
A7	Dry						
A9	Dry						
A10	Dry						
A11	1M, 4F	6M, 8F	N/A	0	8 smooth, 23 palmate newts	0	0
A12	0	0	N/A	0	0	0	0
A14	0	0	N/A	0	1 smooth newt	0	0
A17	0	0	N/A	0	0	0	0
A18	0	0	N/A	0	0	0	0
A19	1M	1M	N/A	0	3 smooth, 4 palmate newts	0	0
A20a	dry						
A20b	0	0	N/A	0	1 palmate newt	0	0
A21	0	0	N/A	0	5 palmate newts	0	0

Table E5: The number of amphibian individuals or eggs identified during Visit 5 (population size estimate surveys)

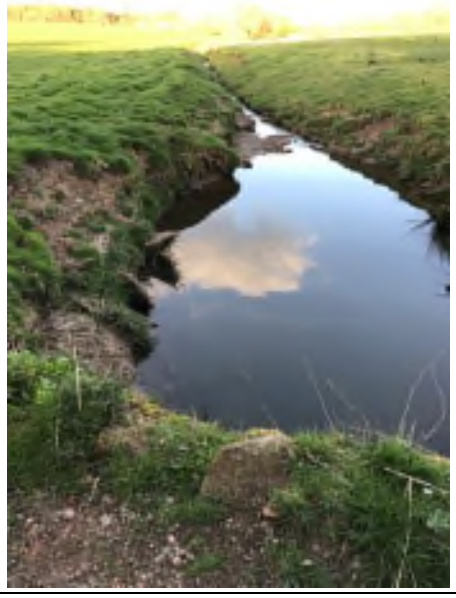
Visit 5							
Pond No.	Great Crested Newt (F: female, M: male, I: immature, U: unknown)				Smooth/Palmate Newt (total count)	Common toad	Common frog
	Torch	Bottle traps	Netting	Egg search			
A11	4F	1M, 2F	N/A	0	6 smooth newts, 11 palmate newts	0	0
A12	0	0	N/A	0	1 palmate newt	0	0
A19	0	0	N/A	0	1 smooth newt, 11 palmate newts	0	0
A21	0	0	N/A	0	4 palmate newts	0	0

Table E6: The number of amphibian individuals or eggs identified during Visit 6 (population size estimate surveys)

Visit 6							
Pond No.	Great Crested Newt (F: female, M: male, I: immature, U: unknown)				Smooth/Palmate Newt (total count)	Common toad	Common frog
	Torch	Bottle traps	Netting	Egg search			
A11	2F	2M	N/A	0	1 smooth newt, 19 palmate newts	0	0
A12	0	1F	N/A	0	0	0	0
A19	0	0	N/A	0	26 palmate newts	0	0
A21	0	0	N/A	0	4 palmate newts	0	0

APPENDIX F - POND PHOTOS

Table F1: Photos of ponds subject to presence/absence and population size estimate surveys

Pond	Photo
Pond A2	
Pond A3	
Pond A5	

Pond	Photo
	
Pond A6	 

Pond	Photo
Pond A7	
Pond A9	
Pond A10	

Pond	Photo
Pond A11	
Pond A12	
Pond A13	 Dried up prior to surveys in 2017
Pond A14	No photo

Pond	Photo
Pond A17	
Pond A18	
Pond A19	

Pond	Photo
Pond A20a	
Pond A20b	
Pond A21	

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