

A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010041

6.7 Environmental Statement – Appendix 9.6 Great Crested Newt Survey Report 2018

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**

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A1 IN NORTHUMBERLAND: MORPETH TO FELTON

Appendix 9.6: Great Crested Newt 2018 Survey Report

APPENDIX 9.6: GREAT CRESTED NEWT 2018 SURVEY REPORT

PROJECT NO. 70044136

OUR REF. NO. HE551459-WSP-EGN-M2F-RP-LE-1942

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EXECUTIVE SUMMARY

Great crested newt surveys were undertaken in 2018 at three ponds in connection to the A1 in Northumberland: Morpeth to Felton (hereby referred to as 'the Scheme').

A great crested newt assessment and survey of the Scheme was completed in 2016 and 2017. The assessment identified twenty-two ponds within 500 m of the Scheme (the 'Survey Area'). These were subjected to Habitat Suitability Index (HSI) assessment based on Oldham *et. al.* (2000) (**Ref. 1.1**) where access was permitted. Following this, presence/likely absence surveys were undertaken. Where great crested newts were present, survey effort was increased to enable population size class assessment to inform the impact assessment.

Two ponds, referred to as Ponds A1 and A4, were not subject to a full survey at that time due to access issues and distance from the Scheme. Access was acquired to both ponds in 2018 and a presence/likely absence assessment was then undertaken to ensure a robust baseline was collected to inform the impact assessment. An additional pond, known as Eshott pond, was scoped in for assessment in 2018 due to its proximity to the Scheme (within 500m).

HSI assessments were made at Ponds A1, A4 and Eshott pond. The results indicated that ponds A1 and A4 had 'Poor' suitability for great crested newts, whilst Eshott pond had 'Good' suitability. Pond A1 was subject to a single presence/likely absence survey, in combination with the HSI survey visit. However, due to the aquatic and terrestrial conditions that were recorded, this pond was scoped out from further assessment. The presence/likely absence survey of Pond 4 and Eshott pond did not record presence of great crested newts, although tadpoles (either frog or common toad) were recorded in Eshott pond.

It was concluded that great crested newts are likely to be absent from all three ponds surveyed, therefore, there are no legal or planning constraints to the Scheme in relation to great crested newts associated with Ponds A1, A4 and Eshott pond.

Great crested newts are present in other ponds within the Survey Area, as identified during the 2016/17 survey (**Ref. 1.2**). Recommendations are made within the Environmental Statement (ES) (**Chapter 9: Biodiversity, Volume 2** of this ES) for appropriate avoidance and mitigation measures for common amphibians, as well as enhancement opportunities for amphibians and other wildlife.

1. INTRODUCTION

1.1. SCHEME BACKGROUND

- 1.1.1. Great crested newt *Triturus cristatus* surveys were undertaken in 2018 at three ponds in connection to the A1 in Northumberland: Morpeth to Felton (hereby referred to as 'the Scheme').
- 1.1.2. The Scheme aims to increase capacity along an approximately 12.6 km section of the existing A1 between Morpeth and Felton in Northumberland, by widening the single carriageway to a dual carriageway. It includes approximately 6.1 km online widening and approximately 6.5 km of new offline highway. The Scheme also aims to improve journey times and safety along the route. The boundary of the Scheme is taken as the Order Limits, as shown in **Figure 1**.

1.2. ECOLOGICAL BACKGROUND

- 1.2.1. **The Applicant** commissioned an assessment of great crested newts in 2016 and 2017. This comprised identification of all waterbodies within 500 m of the Scheme (hereby referred to as 'the Survey Area'), an assessment of their suitability for great crested newts and, where required, surveys to establish the presence/likely absence of this species.
- 1.2.2. Twenty-two ponds were identified within the Survey Area and HSI assessment was undertaken at each. Where appropriate, surveys were subsequently undertaken to establish presence/likely absence (using conventional techniques and/or environmental DNA (eDNA) analysis). Where great crested newts were present, the survey effort was increased to enable population size class assessment to be made, to inform the impact assessment.
- 1.2.3. The results of the survey were presented within the 2016/17 great crested newt survey report (**Ref. 1.2**), with the results of the HSI and eDNA assessments also presented within an earlier report (**Ref. 1.3**).
- 1.2.4. As part of the 2016/17 assessment, one pond (referred to as 'Pond A1') was scoped out from further survey because it was located further than 250 m from the Scheme and had an HSI score indicating '*Below Average*' suitability. A second pond, referred to as 'Pond A4', was not surveyed as access permission was not granted.
- 1.2.5. Access was provided to Pond A4 in 2018. As it had been previously scoped out, Pond A1 had not been subject to presence/likely absence survey and so was included in the surveys in 2018 to ensure a robust assessment.
- 1.2.6. An additional pond to the north of Eshott Airfield, referred to as 'Eshott pond', was identified for assessment in 2018 as it was located within 500 m of the Scheme (site compound during construction phase). This pond was not assessed in 2016/17 as it then fell outside the **Study Area**.
- 1.2.7. This report presents the findings of the great crested newt assessment undertaken in 2018 at Ponds A1, A4 and Eshott pond.

1.3. OBJECTIVES

1.3.1. **The Applicant** commissioned the following:

- a.** HSI assessment of Ponds A1, A4 and Eshott pond to assess their suitability as aquatic habitat for great crested newts and determine if further survey was required.
- b.** A great crested newt survey to determine the presence or likely absence of this species in the three ponds and to enable a population size class assessment to be made where presence was confirmed.

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

2. METHODS

2.1. OVERVIEW

- 2.1.1. The great crested newt survey of Ponds A1, A4 and Eshott pond included HSI assessment, presence/ likely absence surveys and eDNA surveys, as shown in **Table 2-1**.
- 2.1.2. Each survey was carried out by surveyors with experience (lead surveyors had a minimum of two years' experience) of surveying great crested newts. At least one surveyor at each visit held a Natural England class survey licence for great crested newts (2015-16685-CLS-CLS, 2017-32464- CLS-CLS, 2015-16952-CLS-CLS, 2015-17250-CLS-CLS).

Table 2-1 - 2018 Survey Effort

Pond Reference	Habitat Suitability Index Assessment	Presence/Likely Absence Survey	Environmental DNA Survey
A1	P	-	-
A4	P	P	-
Eshott Pond	P	P	P

2.2. HABITAT SUITABILITY INDEX (HSI) ASSESSMENT

- 2.2.1. Ponds A1, A4 and Eshott pond were assessed for their suitability to support great crested newts, using the standard HSI assessment method (ARG UK, 2010 (**Ref. 1.4**), based on Oldham et al. (2000) (**Ref. 1.1**). Ponds were identified using 1:25,000 OS mapping, cross-referenced against aerial photography.
- 2.2.2. Ponds were assessed and scored on ten key variables which are known to influence breeding populations of great crested newts, in accordance with the standard HSI method (**Ref. 1.4**). These variables are:
- a. Geographic location.
 - b. Water body area.
 - c. Water body permanence.
 - d. Water quality.
 - e. Water body shading.
 - f. Impact of waterfowl.
 - g. Fish stocks.
 - h. Number of ponds within 1 km.
 - i. Terrestrial habitat around the water body.
 - j. Macrophyte cover of the water body.

- 2.2.3. Scores for each of the above variables were used to calculate an overall HSI score for each pond. This was then cross-referenced with the guidelines (**Ref. 1.4**) to assign the pond to one of five categories; poor, below average, average, good or excellent. HSI is not a failsafe method of identifying whether a pond supports great crested newts or not; therefore, professional judgement and availability of records of great crested newt in the locality has also been used to inform the requirement for further survey.

2.3. PRESENCE/LIKELY ABSENCE SURVEY

- 2.3.1. Ponds A4 and Eshott pond were subject to surveys to determine the presence/likely absence of great crested newts. Pond A1 was subject to a single survey (combined with the HSI survey visit), however, was scoped out from further assessment, as detailed within this report.
- 2.3.2. Presence/likely absence surveys comprised four visits between mid-March and mid-June, with at least two of the visits within the peak period of activity, mid-April and mid-May. Survey visits were undertaken in suitable weather conditions, with overnight temperatures of above 5°C and insufficient wind and rain to affect the torchlight survey results by disturbance of the water surface.
- 2.3.3. At least three survey techniques were used during each survey visit to search for the presence of great crested newts, in line with good practice (**Ref. 1.5**). These included:
- a. Torchlight searching** – each pond 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 pond perimeter.
 - b. Bottle-trapping** – each pond was trapped using bottle traps constructed and set in accordance with standard guidance (**Ref. 1.6**). Traps were set at a ratio of one for every 2 m of pond perimeter with a maximum of 50 per water body. The traps were set prior to dusk, and checked and removed the following morning.
 - c. Egg searching** – where vegetation in each pond was present, vegetation was searched for 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 thoroughly all vegetation present, or a maximum of 15 minutes per survey visit¹.
 - d. Hand Netting** - a net was used to sample each water body at regular intervals (every 2m) around the water body perimeter.
 - e. Refugia search** – terrestrial refugia around margins of pond were searched for at ponds where other methods were not suitable.

¹ Once a great crested newt 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.

2.4. ENVIRONMENTAL DNA ASSESSMENT

- 2.4.1. Eshott pond was subjected to an eDNA assessment. This involved obtaining water samples using a kit provided by a Natural England approved supplier (Nature Metrics). Water samples were preserved on site in a buffer solution, stored in a cool box to avoid degradation of the sample and returned via courier to the laboratory for analysis. The sampling and analysis techniques were compliant with the approved protocol, as recognised by Natural England (**Ref. 1.7**).

2.5. DATES OF SURVEY

- 2.5.1. The date of each survey visit is shown in **Table 2-2** below.

Table 2-2 - Survey Dates

Waterbody Ref.	HSI Survey	Presence/ Likely Absence Survey Visits				eDNA survey visit
		1	2	3	4	
A1	24/04/2018	24/04/2018	N/A	N/A	N/A	N/A
A4	10/05/2018	24/04/2018	10/05/2018	16/05/2018	30/05/2018	N/A
Eshott pond	10/05/2018	24/04/2018	10/05/2018	16/05/2018	30/05/2018	19/06/2018

2.6. NOTES AND LIMITATIONS

- 2.6.1. The absence of egg-laying vegetation and shallow water within Pond 4 inhibited egg searches and hand netting. At this pond, only bottle-trapping and torching were considered effective. Terrestrial refugia searches were also undertaken to increase the survey efficiency. Overall, this is not considered to have affected the validity of the survey findings or conclusions.
- 2.6.2. Approximately 30% of the Eshott pond margin could not be accessed due to the presence of steep banks supporting hawthorn *Crataegus monogyna* and gorse *Ulex europaeus*. An additional 20% of the margins were dominated by dense bulrush *Typha latifolia*, which inhibited the efficiency of torching and hand netting. Because of this, an eDNA survey was also undertaken at this location. Because of the level of survey effort and the successful use of several different survey techniques, this is not considered to have affected the validity of the survey findings or conclusions.

3. RESULTS AND EVALUATION

3.1. OVERVIEW

- 3.1.1. Ponds A1, A4 and Eshott pond (**Figure 1**) were all subject to HSI (**Ref. 1.1**). The results indicate that Ponds A1 and A4 have 'Poor' suitability for great crested newts, whilst Eshott pond is considered to have 'Good' suitability (**Figure 2**).
- 3.1.2. Presence/likely absence surveys (four visits) were undertaken at Pond A4 and Eshott pond. No great crested newts were detected. Pond A1 was subject to a single survey, in combination with the HSI survey visit. However, due to the unsuitable aquatic and terrestrial conditions present, this pond was scoped out from further assessment (**Figure 3**).
- 3.1.3. At Eshott pond (**Section 2.6.2**), an eDNA assessment was also undertaken, to provide a robust data set. The eDNA survey returned a 'Negative' result, indicating the likely absence of great crested newts (**Figure 4**).

3.2. POND DESCRIPTIONS

- 3.2.1. Pond A1 was heavily polluted and eutrophic (indicated by the smell of the water) and farm materials were observed to have been discarded in and around the pond. The pond was heavily turbid, did not support emergent vegetation suitable for egg-laying and is surrounded by arable farmland.
- 3.2.2. Pond A4 was relatively shallow, approximately 0.4 m at its deepest point, with a dense silt base. The pond was used by low numbers of waterfowl, although this has potentially had a major negative impact on pond vegetation, and no emergent vegetation was present. The northern and western banks of the pond were steep-sided and vertical (between 0.3 and 0.5 m high), which may inhibit amphibian movement from the pond. The pond was largely surrounded by grazed pasture (horses), although the immediate area around the pond was scrubby grassland which could support amphibians.
- 3.2.3. Eshott pond is large and comprised two adjacent waterbodies (large enough to be described as lakes). The margins were dominated by bulrush and reeds that, in places, were very dense. The marginal vegetation had deposited dead or decaying material around the pond edges, creating a floating matt in several locations. The banks of the pond supported scattered hawthorn and gorse scrub and, in places, were steep-sided. A single small carp was observed in the ponds. The ponds are largely surrounded by grazed pasture fields (sheep) although dense scrub and broadleaved woodland are present to the north.

3.3. HABITAT SUITABILITY ASSESSMENT (HSI)

- 3.3.1. A summary of the HSI results and location information for the surveyed ponds are included in **Table 3-1** and presented on **Figure 2**, with photographs of each water body in **Appendix A**. The HSI calculations are included in **Appendix B**.
- 3.3.2. The HSI results are considered to be an accurate indication of the suitability of the surveyed ponds to support great crested newts.

Table 3-1 - Summary of HSI Results

Water body Ref.	Grid Reference	Proximity to Site	HSI Score	HSI Category	Photo Ref.
A1	NZ 188 894	400m	0.43	Poor	Photos 1 and 2
A4	NZ 178 919	170m	0.41	Poor	Photos 3 and 4
Eshott pond	NZ 182 989	360m	0.70	Good	Photos 5, 6 and 7

3.4. PRESENCE/LIKELY ABSENCE SURVEY AND POPULATION SIZE CLASS ASSESSMENT

- 3.4.1. The results of the great crested newt presence/likely absence are shown in **Table 3-2** below and **Figure 3**.

Table 3-2 - Summary of Presence/Likely Absence Survey Results

Water Body Ref.	Adult GCN Peak Count	Breeding Activity Recorded	Incidental Species Recorded
A4	0	0	N/A
Eshott pond	0	0	Smooth and palmate newts, tadpoles

- 3.4.2. No great crested newts or signs of their presence (i.e. eggs or larvae) were recorded during the survey.
- 3.4.3. All surveys were completed under appropriate conditions, with overnight minimum temperatures ranging between 6°C and 12°C and pond conditions suitable for methods used to be effective. Full details of weather and pond conditions on each survey visit are included in **Appendix C**.

3.5. ENVIRONMENTAL DNA ASSESSMENT

- 3.5.1. An eDNA survey was undertaken at Eshott pond, using four kits across the two waterbodies that make up the pond. All accessible pond margins were surveyed, including those areas where the presence/likely absence survey techniques were constrained.

- 3.5.2. The laboratory analysis did not identify any damage or deterioration in the sample. The analysis returned a '*Negative*' result, indicating the absence of great crested newts (eDNA report presented in **Appendix D** and results presented on **Figure 4**).

4. IMPLICATIONS FOR DEVELOPMENT

4.1. OVERVIEW

- 4.1.1. The survey results indicate that great crested newts are likely to be absent from the surveyed ponds. Therefore, there are no legal or planning constraints in relation to this species for the three ponds covered in this report. The legislation and national planning policy listed beneath is included for information only.

4.2. LEGAL COMPLIANCE

GREAT CRESTED NEWTS

- 4.2.1. Great crested newts are afforded a high level of protection under the Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations', **Ref. 1.8**), the legislation means that it is an offence to:

- a.** Deliberately capture, injure or kill a wild great crested newt
- b.** Deliberately disturb wild great crested newts; '*disturbance of animals includes in particular any disturbance which is likely:*

(a) to impair their ability —

(i) to survive, to breed or reproduce, or to rear or nurture their young; or

(ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate; or

(b) to affect significantly the local distribution or abundance of the species to which they belong.'

- c.** Damage or destroy a breeding site or resting place used by this species.

- 4.2.2. Protection is also afforded under the Wildlife and Countryside Act 1981 (as amended) (**Ref. 1.9**) with respect to disturbance of animals when using places of shelter, and obstruction of access to places of shelter.

- 4.2.3. Due to the high level of protection afforded to great crested newts and their habitat, mitigation for this species is governed by a strict licensing procedure administered by Natural England (normally, planning permission must be obtained before a licence can be sought). Licencing is subject to three tests, as defined under the Habitats Regulations, these must also be applied by the planning authority before granting permission for activities affecting great crested newts. For permission to be granted the following criteria must be satisfied:

- a.** The proposal is necessary '*to preserve public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment*'
- b.** '*There is no satisfactory alternative*'

c. The proposals *‘will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range’*

- 4.2.4. The great crested newt is also listed as a Species of Principal Importance (SPI) for the Conservation of Biodiversity in England in accordance with Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (**Ref. 1.10**). Under Section 40 of the NERC Act (2006) public bodies (including local planning authorities) have a duty to have regard for the conservation of SPI when carrying out their functions, including determining planning applications.

OTHER AMPHIBIANS

- 4.2.5. Smooth *Lissotriton vulgaris* and palmate newt *Lissotriton helveticus* were recorded during the surveys. Whilst these species are protected from sale and trade, these species are not afforded the high level of protection given to the great crested newt.
- 4.2.6. There were records of common toad *Bufo bufo* noted in the Phase 1 Assessment (**Ref. 1.11**). Whilst no adult toads were recorded during the surveys carried out by WSP, tadpoles were recorded within A4 (either frog or common toad). The common toad is also listed as a Species of Principal Importance (SPI) in accordance with Section 41 of the NERC Act 2006 (**Ref. 1.10**); therefore, public bodies, including local planning authorities, have a duty to have regard for the conservation of this species when carrying out their functions.

4.3. PLANNING POLICY COMPLIANCE

- 4.3.1. At the national level, the Scheme is governed by the National Policy Statement for National Networks (NPS NN) (2014) (**Ref. 1.12**). The NPS NN states that, *“as a general principle, ... development should avoid significant harm to biodiversity ... conservation interests, including through mitigation and consideration of reasonable alternatives... Where significant harm cannot be avoided or mitigated, as a last resort, appropriate compensation measures should be sought”*. In addition, the National Planning Policy Framework (2019) (NPPF) (**Ref. 1.13**) forms the basis for planning system decisions with respect to conserving and enhancing the natural environment, including great crested newts. The ODPM circular 06/2005 (**Ref. 1.14**) (referenced within the NPS NN) also provides supplementary guidance, including confirmation that *“the presence of a protected species is a material consideration when a planning authority is considering a development proposal”*.
- 4.3.2. The NPPF sets out, amongst other points, how at an overview level the *“planning policies and decisions should contribute to and enhance the natural and local environment by:*
- a.** *...recognising the ... wider benefits from natural capital ecosystem services...*
 - b.** *minimising impacts on and providing net gains for biodiversity where possible, including by establishing coherent ecological networks that are more resilient to current and future pressures...*”
- 4.3.3. A list of principles which local planning authorities should follow when determining planning applications is included in the NPPF, and includes the following:

- a. “- if significant harm to biodiversity resulting from a development cannot be avoided...adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused*
- b. - ...opportunities to incorporate biodiversity in and around developments should be encouraged*
- c. - development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists.”*

4.3.4. At a local level, great crested newts are listed as Priority Species on the Northumberland Local Biodiversity Action Plan (LBAP) (**Ref. 1.15**).

4.3.5. Current targets outlined in the Northumberland LBAP are the following:

- a.** Maintain the current range of the great crested newt in Northumberland of 41 sites by 2015
- b.** Increase the current range of the great crested newt in Northumberland to 66 sites by 2015

5. RECOMMENDATIONS

5.1. AVOIDANCE AND MITIGATION MEASURES

GREAT CRESTED NEWT

- 5.1.1. Great crested newts are likely to be absent from the three ponds surveyed in 2018: A1, A4 and Eshott pond. No avoidance or mitigation measures are required.
- 5.1.2. Great crested newts are present in other ponds within 500 m of the Scheme (**Ref. 1.2**). Recommendations are made in the Environmental Statement (ES) (**Chapter 9: Biodiversity, Volume 2** of this ES) in relation to great crested newts within the area of the Scheme. These include obtaining European Protected Species (EPS) licences to address impacts upon two great crested newt populations.

5.2. ECOLOGICAL ENHANCEMENT MEASURES

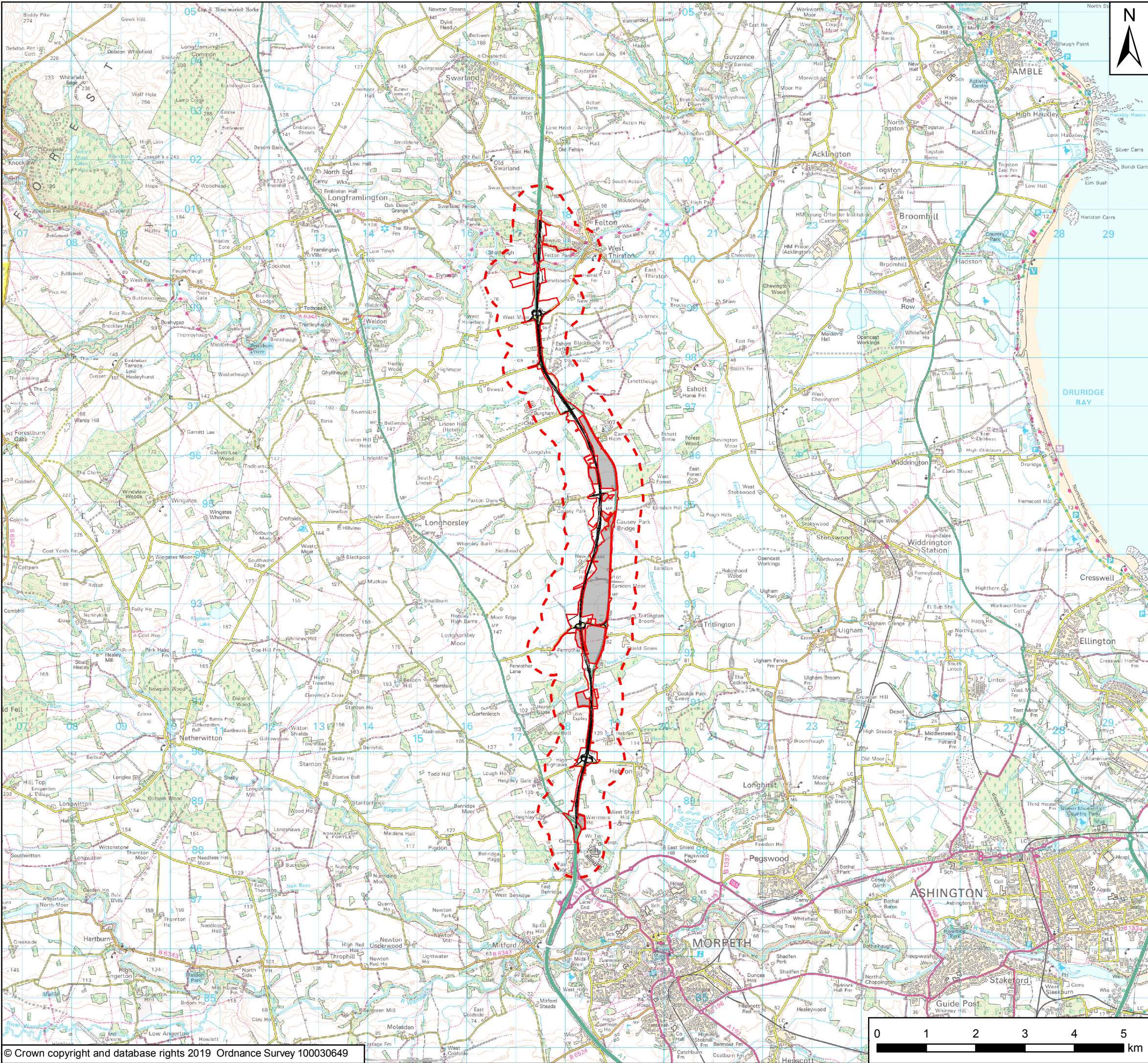
- 5.2.1. National and local planning policy requires ecological enhancement measures to be provided by new development schemes. Enhancement measures for the Scheme, relevant to great crested newts and other amphibians are described in the ES.

6. CONCLUSIONS

- 6.1.1. A great crested newt assessment was undertaken at three ponds within 500 m of the Scheme: A1, A4 and Eshott pond. HSI assessment indicated that Ponds A1 and A4 have 'Poor' suitability for great crested newts, whilst Eshott pond has 'Good' suitability (in accordance with Oldham et. al. (2000) (**Ref. 1.1**).
- 6.1.2. Pond A1 was subject to a single presence/likely absence survey (undertaken in combination with the HSI visit). This pond was scoped out of further assessment because of its poor suitability. Pond A1 and Eshott pond were subjected to four survey visits to establish presence/ likely absence of great crested newts. No great crested newts were recorded at either pond.
- 6.1.3. At Eshott pond, an eDNA survey was also undertaken. The result returned was negative, indicating the likely absence of great crested newts.
- 6.1.4. It was concluded that great crested newts are likely to be absent from all three ponds surveyed. No legal or planning constraints in relation to great crested newts apply to Ponds A1, A4 and Eshott pond.
- 6.1.5. Great crested newts are present in other ponds close to the Scheme (**Ref 1.2**). Recommendations for great crested newts within the whole of the Scheme area are made within the ES. Appropriate avoidance and mitigation measures for common amphibians, and enhancement opportunities for amphibians and other wildlife are also made in the ES.

7. REFERENCES

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Key

- Order Limits
- Areas Excluded from Order Limits
- General Arrangement
- 500m Study Area

P02	12/07/19	Second Issue	GH	JF	NM
P01	28/03/18	First Issue	JSdS	JF	SP
Rev	Date	Description	By	Chk'd	App'd

Client

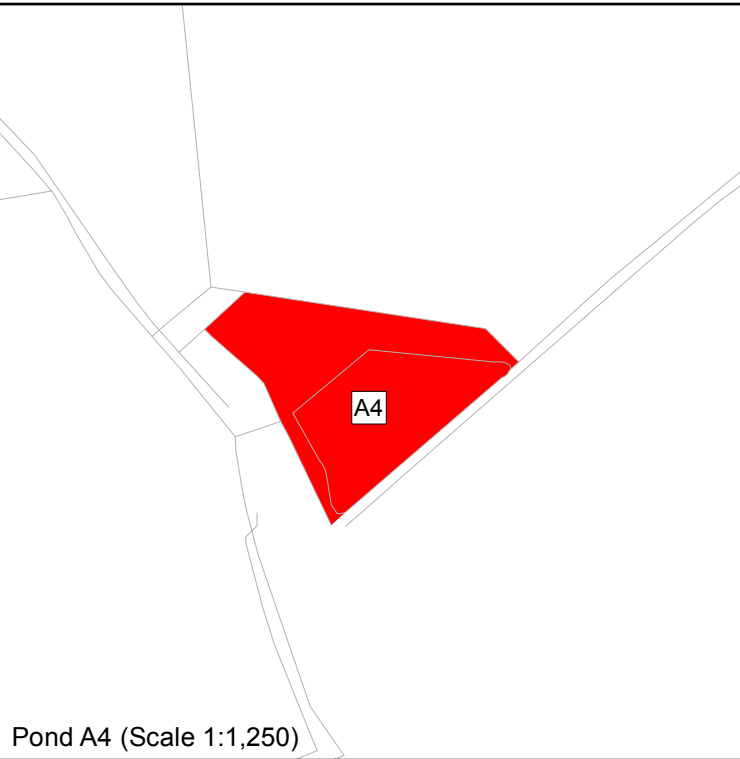
Project Title

A1 in Northumberland: Morpeth to Felton

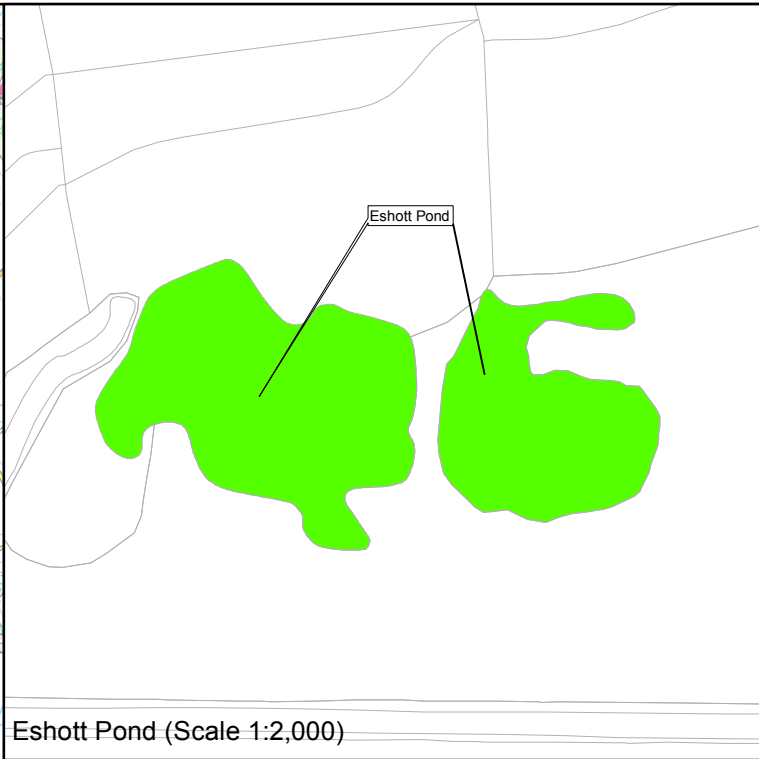
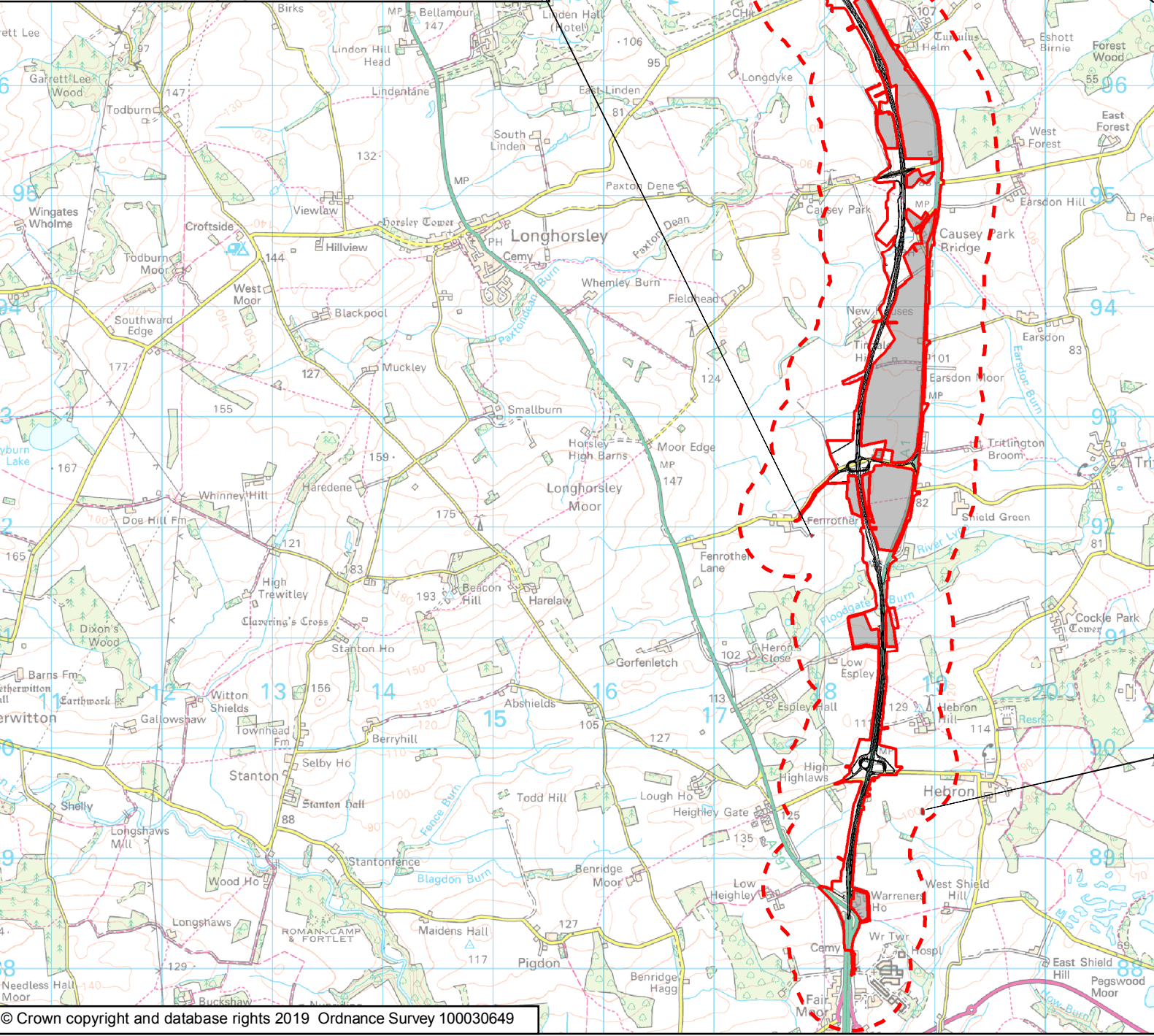
Drawing Title

Figure 1 Scheme Location Plan

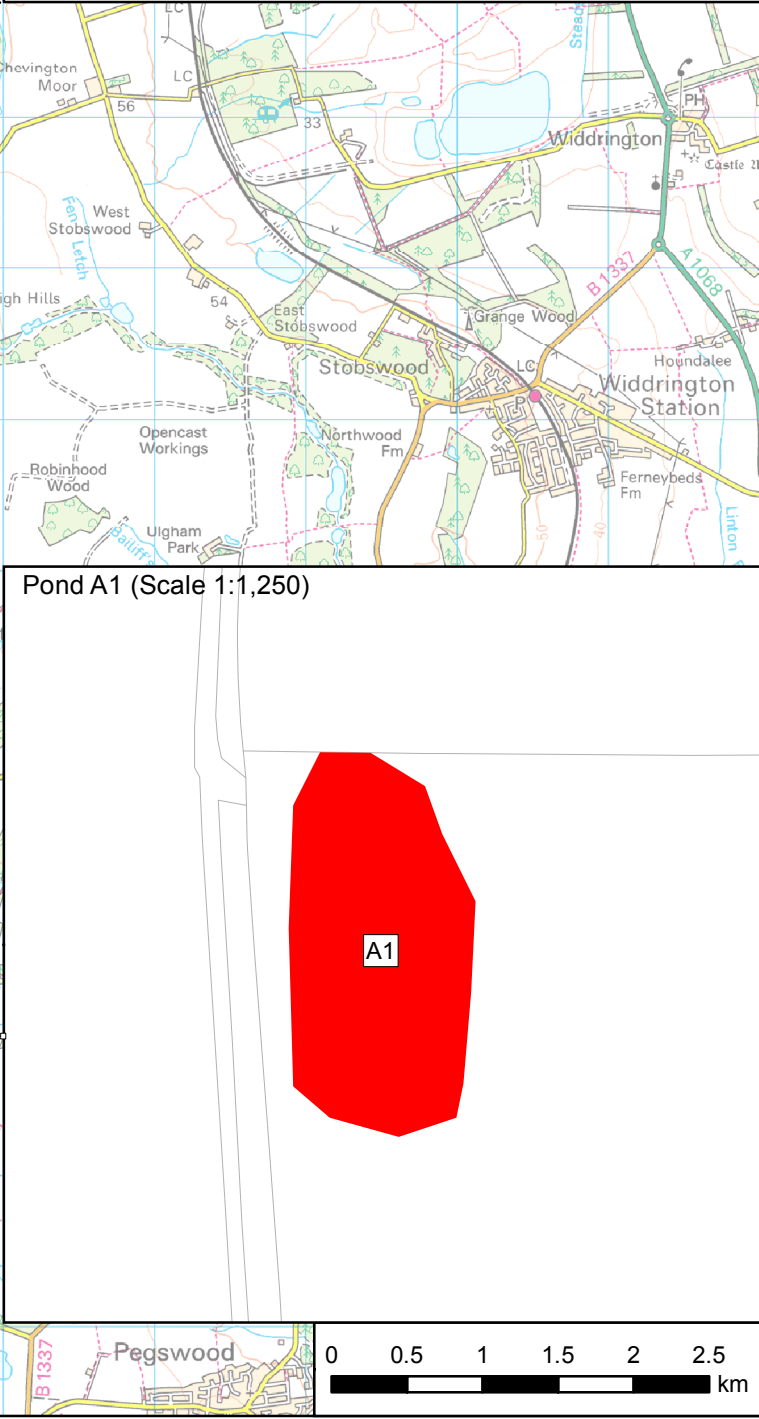
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Drawing Status	For Information								Suitability	S1
Drawing Number	HE551459		Originator	WSP		Volume	6.3		Project Ref. No.	70044136
M2F			Type			Role			Revision	P02
Location						Number				



Pond A4 (Scale 1:1,250)



Pond A1 (Scale 1:1,250)



Key

Order Limits

Areas Excluded from Order Limits

General Arrangement

500m Study Area

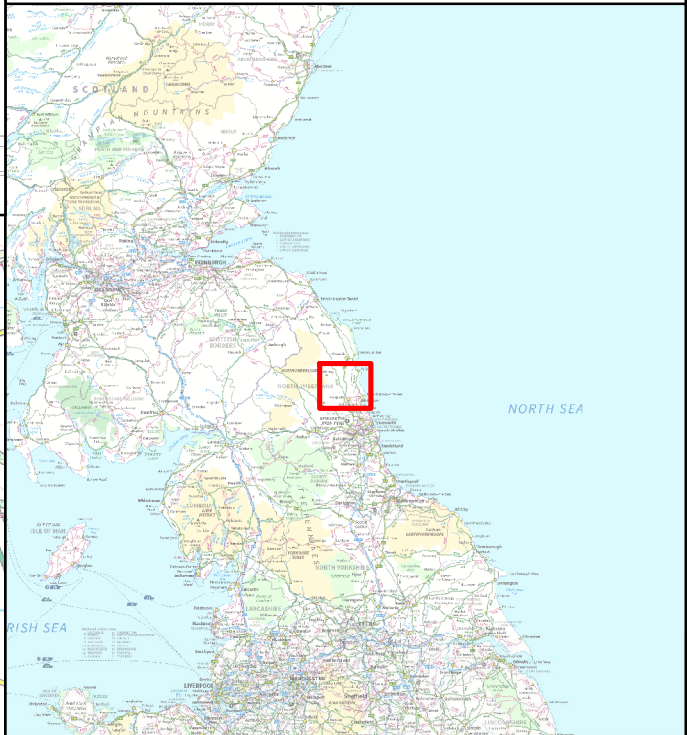
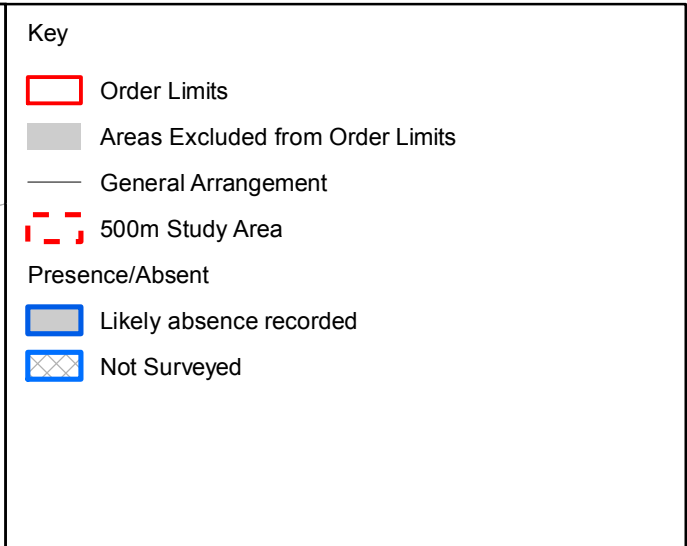
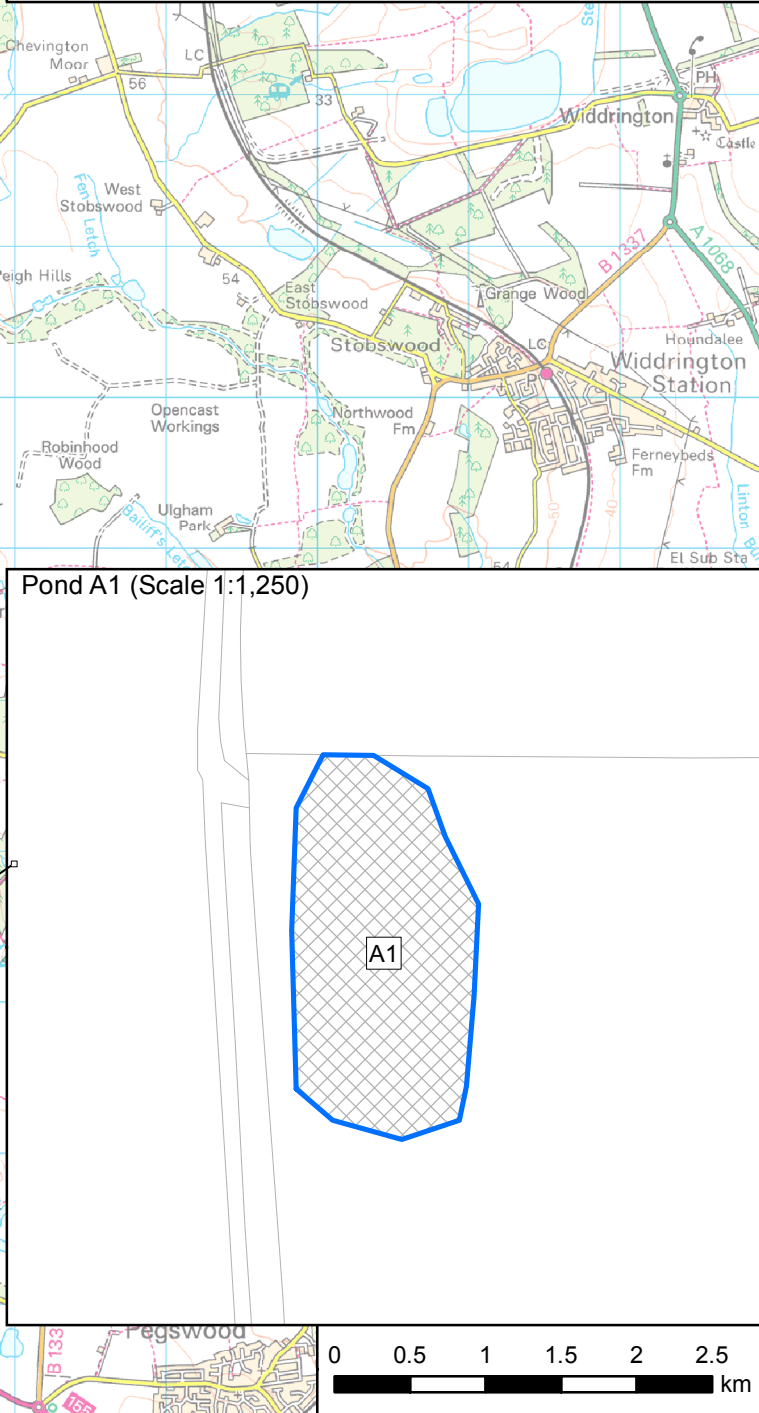
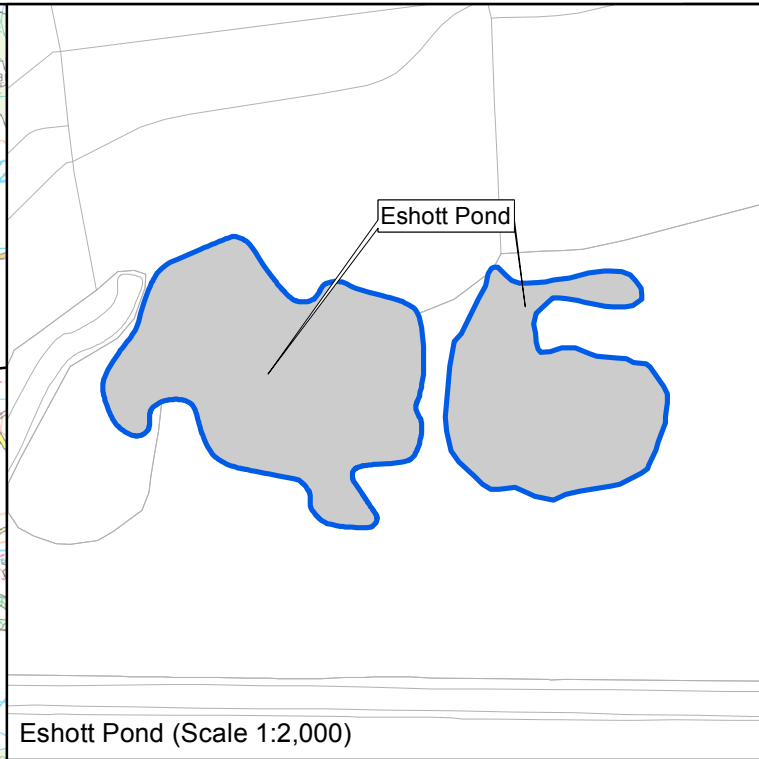
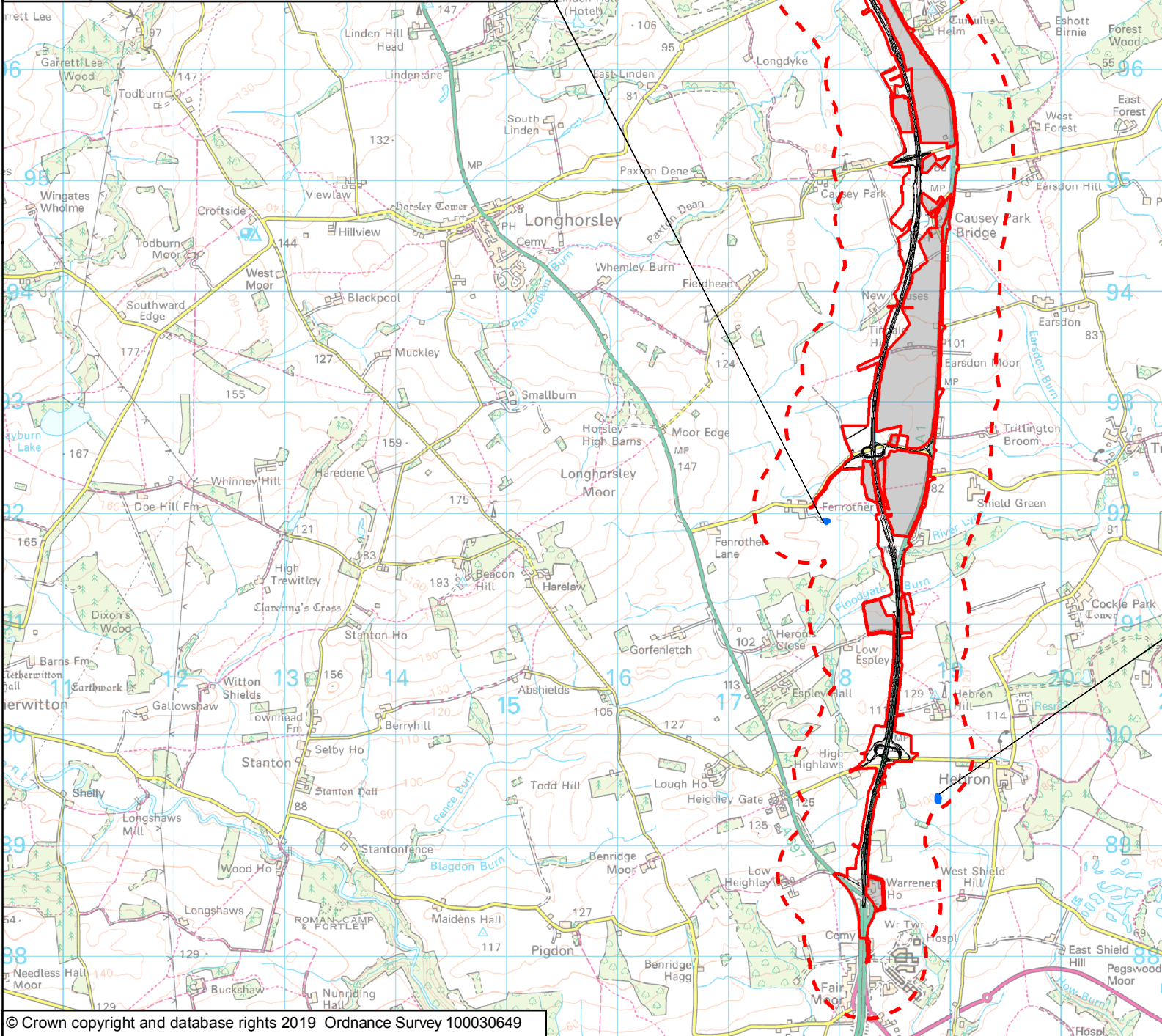
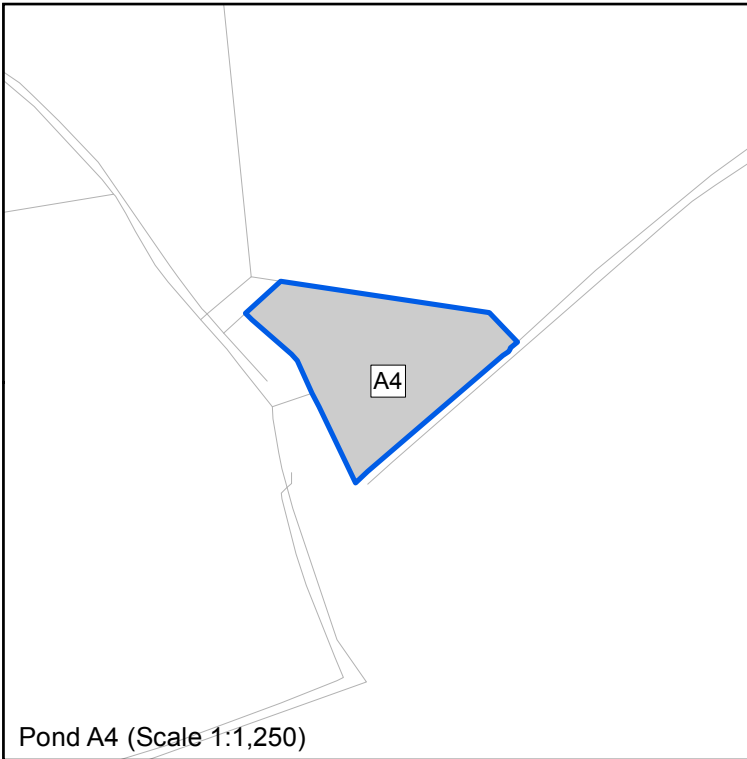
Habitat Suitability Index

Good

Poor

P02	12/07/19	Second Issue	GH	JF	NM
P01	07/08/2018	First Issue	JSdS	JF	SP
Rev	Date	Description	By	Chk'd	App'd
Client					
Project Title					
A1 in Northumberland: Morpeth to Felton					
Drawing Title					
Figure 2 Survey Results: Habitat Suitability Index Survey					
Scale	Drawn	Checked	Approved	Authorised	
1:50,000	JSdS	JF	SP	DM	
Original Size	Date	Date	Date	Date	
A3	07/08/2018	07/08/2018	07/08/2018	07/08/2018	
Drawing Status					Suitability
For Information					S1
Drawing Number		Originator	Volume	Project Ref. No.	
HE551459		WSP	6.3	70044136	
M2F		Type	Role	Revision	
Location			Number	P02	

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P02	12/07/19	Second Issue	GH	JF	NM
P01	28/03/18	First Issue	JSdS	JF	SP
Rev	Date	Description	By	Chk'd	App'd

Client

 highways
england

Project Title	A1 in Northumberland: Morpeth to Felton
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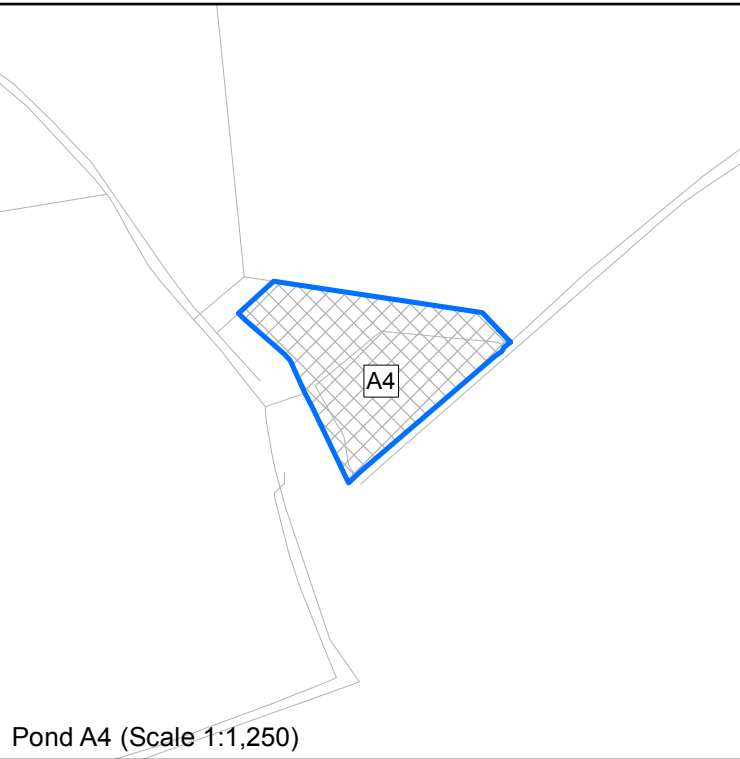
Drawing Title

Figure 3 Survey Results -
Precence/Likely Absence Survey

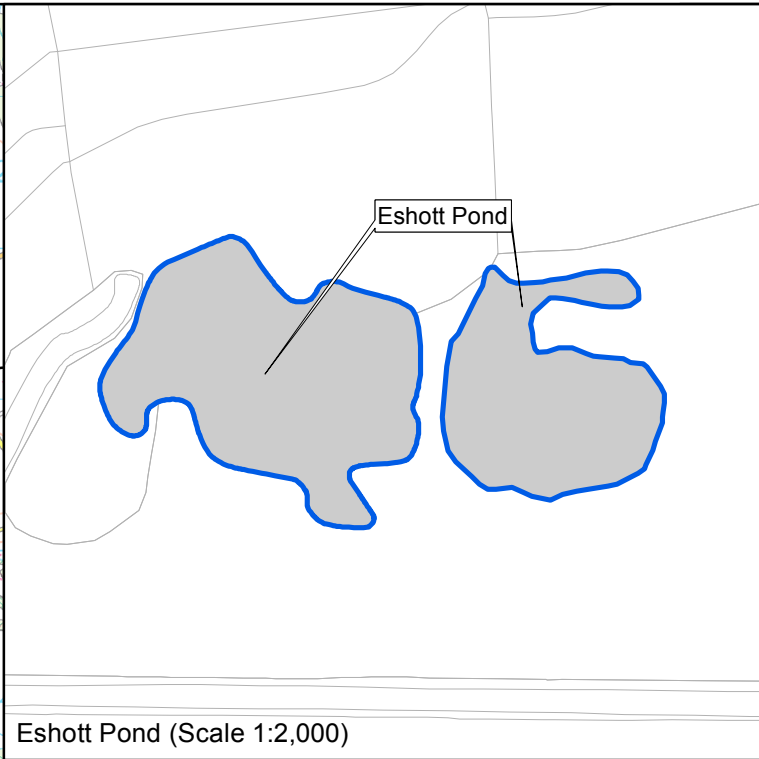
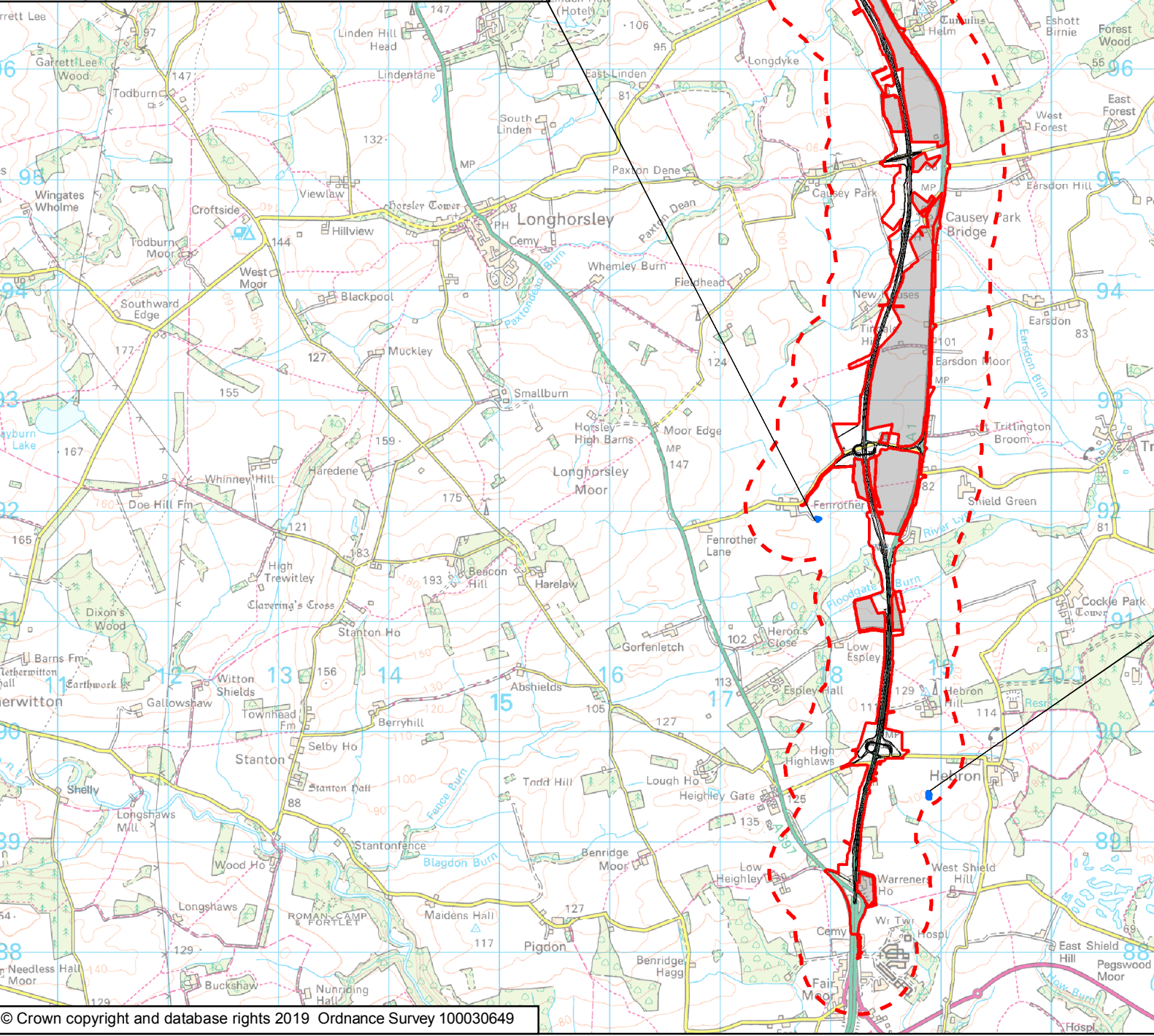
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Drawing Status	Suitability
For Information	S1

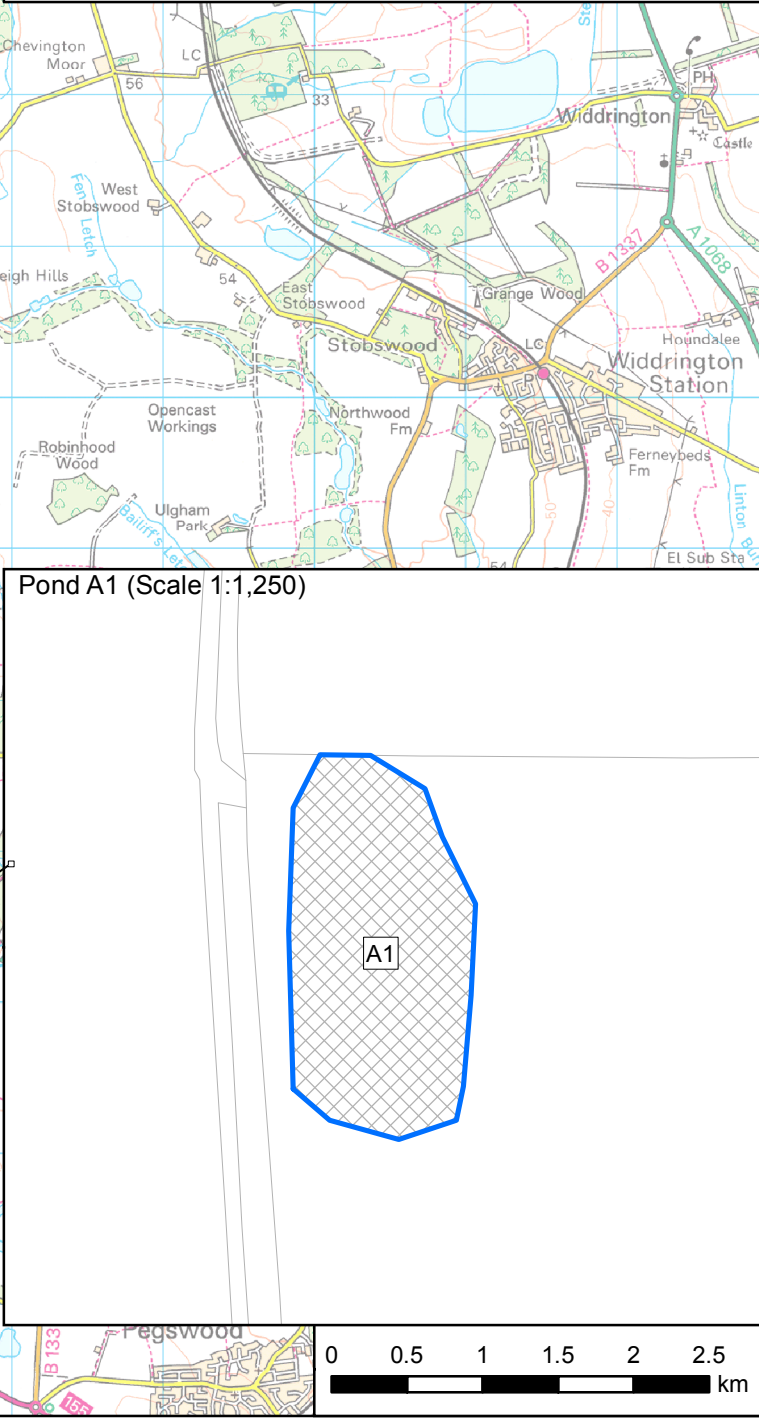
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HE551459			WSP			6.3			70044136		
M2F Location			Type			Role			Number		
									P02		



Pond A4 (Scale 1:1,250)



Eshott Pond (Scale 1:2,000)



Pond A1 (Scale 1:1,250)

Key

Order Limits

Areas Excluded from Order Limits

General Arrangement

500m Study Area

eDNA Survey Results

Negative



Not Surveyed

P02	12/07/19	Second Issue	GH	JF	NM
P01	28/03/18	First Issue	JSdS	JF	SP
Rev	Date	Description	By	Chk'd	App'd
Client					
Project Title					
A1 in Northumberland: Morpeth to Felton					
Drawing Title					
Figure 4 Survey Results - eDNA Survey Results					
Scale	Drawn	Checked	Approved	Authorised	
1:50,000	JSdS	JF	SP	DM	
Original Size	Date	Date	Date	Date	
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Drawing Status					Suitability
For Information					S1
Drawing Number		Originator	Volume	Project Ref. No.	
HE551459		WSP	6.3	70044136	
M2F		Type	Role	Revision	
Location			Number	P02	

Appendix A

PHOTOGRAPHS

Photographs

Pond Ref.	Image	Description / Comment
A1		<p>Photo 1. Pond A1, showing poor water quality (heavily turbid).</p> <p>Photo 2. Pond A1- Margins have steep defined banks with no gradual sloping into the centre of the pond. A wooden board is situated at one end as a barrier for vehicles reversing up to pond and dumping waste.</p>
A4		<p>Photo 3. Pond A4. The margins closest to the photo position are steep and vertical (approximately 0.5 m in height). Rock pile to the east of the pond (left) was searched for terrestrial newts.</p> <p>Photo 4. Pond A4, no macrophytes in the pond and no marginal vegetation suitable for egg-laying.</p>

Eshott
pond



Photo 5. Eshott pond, dense vegetation around the steep margins, within limited access to the western body of water.



Photo 6. Eshott pond – eastern body of water. Dense scrub on the northern margins.



Photo 7. Eshott pond – narrow strip of land that separates the two waterbodies that comprise the pond.

Appendix B

2018 HSI CALCULATIONS

HSI Calculations

Pond Ref.	S1: Geographic location	S2: Water body area	S3: Water body permanence	S4: Water quality	S5: % Shade (1m from bank)	S6: Impact of waterfowl	S7: Fish stocks	S8: Number of ponds <1 km	S9: Terrestrial habitat	S10: Macrophyte cover (%cover)	HSI SCORE	HSI CATEGORY
A1	1	0.4	1	0.01	1	1	1	0.6	0.33	0.3	0.43	Poor
A4	1	0.6	0.5	0.33	1	0.01	1	0.67	0.67	0.3	0.41	Poor
Eshott pond	1	1	0.9	1	1	0.67	0.33	0.5	0.67	0.4	0.70	Good

Appendix C

2018 PRESENCE/LIKELY ABSENCE
SURVEY RESULTS

Pond Survey Results

Date	GCN detected	Peak adult count	GCN Eggs or Larvae present	Air Temperature (oC)	Vegetation Cover (0-5)	Turbidity (0-5)	Other Amphibians Recorded	GCN Population Size Class
Pond Reference		A1						
24/04/2018	No	N/A	No	6	0	5	No	N/A
Pond Reference		A4						
24/04/2018	No	N/A	No	6	0	1	No	N/A
10/05/2018	No	N/A	No	5	0	0	No	
16/05/2018	No	N/A	No	5	0	1	Yes	
30/05/2018	No	N/A	No	12	0	2	No	
Pond Reference		Eshott pond						
24/04/2018	No	N/A	No	6	1	1	No	N/A
10/05/2018	No	N/A	No	5	2	0	Yes	
16/05/2018	No	N/A	No	5	3	0	Yes	
30/05/2018	No	N/A	No	12	1	2	Yes	

Appendix D

ESHOTT POND EDNA ANALYSIS REPORT

18257-WS-JF-1

Order number: WSP-14-JF

Great Crested Newt eDNA Results

Company: WSP
Address: 3 White Rose Office Park, Millshaw Park Lane, Leeds, LS11 0DL
Contact: Jack Fenwick
Project code | Task code: Morpeth to Felton - 70044136-W57 | M2F eDNA - 001
Date of Report: 26 June 2018
Number of samples: 4

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 your samples. 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
GCN18-0407	'ESHOTT EAST 1'	21-Jun-18	No	No	0	Negative
GCN18-0406	'ESHOTT EAST 2'	21-Jun-18	No	No	0	Negative
GCN18-0400	'ESHOTT WEST 1'	21-Jun-18	No	No	0	Negative
GCN18-0 398	'ESHOTT WEST 2'	21-Jun-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.



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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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