Skyline Ecology

Monckton Coke Works

Great Crested Newt Survey

FINAL

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Appendix B Great Crested Newt Survey Results

1 Executive Summary

1.1.1 The site is a former coke works, located on Lund Hill Lane (B6428), to the east of Royston at ordnance survey grid reference SE 374121. The site comprises of a large area of predominantly bare ground where coke processing and storage would have taken place. Many of the buildings which would have once been on site have been demolished leaving numerous piles of building rubble. Around the perimeter of the site are areas of developing woodland and scrub.

1.1.2 SBRC provided 100 records of amphibian for the search area, of these 47 are for common toad *Bufo bufo*, and seven are for great crested newts *Triturus cristatus* the closest of which appears to be 50 metres to the east of the site at Rabbit Ings Country Park. WYE did not provide any records for great crested newt for the search area.

1.1.3 Previous surveys undertaken by AES Ltd. Identified that in 2013 the open water/marshy grassland in the north eastern corner (Pond 4) contained a small population of great crested newts. A European Protected Species Licence (EPSL) was granted within Rabbit Ings Country Park to translocate great crested newts. According to AES Ltd 156 great crested newts were moved as part of this licence.

1.1.4 Current maps and aerial photography and initial site visits identified 14 waterbodies within 500 metres of the boundary of the study site. Of these three were dry at the time of survey, and three could not be accessed due to access permissions.

1.1.5 The results of the HSI show that ponds 6, 8 and 9 have excellent suitability to support great crested newts, ponds 1 and 2 good potential to support great crested newts, with pond 4 having below average suitability and pond 5 and the canal being classed as having poor suitability to support great crested newts.

1.1.6 The results of the presence/absence and population surveys show that no great crested newts have been recorded within the boundary of the site. However, there are direct links from ponds adjacent to the site which have confirmed results of great crested newts, the closest being Pond 6. These (Ponds 6, 8 and 9) ponds have a small population individually but a medium meta population.

1.1.7 Prior to any works being completed on the site a Licence will need to be secured from Natural England. Within the licence methodology there will be details on how the site will be trapped out to remove any risk to great crested newts.

1.1.8 As a precautionary approach both of the lagoons should be drained under licence and under the supervision of a licenced ecologist. Any amphibians found should be relocated to a suitable receptor site.

1.1.9 During construction, staff will receive a toolbox talk as to procedures to follow if amphibians are discovered during works. This element will also form part of the EPSL from Natural England

1.1.10 To ensure that there is suitable habitat within the study site a wildlife pond will be created on the north west of the site within a designated greenspace, specifically for the purposes of wildlife conservation. Other features such as habitat piles will be placed within these areas to encourage amphibians.

1.1.11 Potential effects during operation can be avoided through the design of a sensitive drainage system at the detailed design stage to reduce the risk of amphibians being caught in features such as gully pots. The installation of amphibian friendly gully pots and amphibian underpasses should also be used in areas of the site where amphibians may be encountered.

2 Introduction

2.1 Site Description

2.1.1 The site is a former coke works, located on Lund Hill Lane (B6428), to the east of Royston at ordnance survey grid reference SE 374121.

2.2 Description of Project and Background to Commission

2.2.1 This ecological report has been prepared by Skyline Ecology on behalf of the client. It is understood that the report is to form a planning application for the development of the site for residential housing.

2.3 Aims of Study

2.3.1 The objectives of the desk study and survey were as follows:

- Present evidence of, or any potential for, protected species supported by the site;
- Set out the legislative and/or policy protection afforded to protected species associated with the site;
- Present an assessment of any potential ecological impacts of development within the site based on the survey findings;
- Provide recommendations for any further surveys if considered necessary; and
- Provide recommendations on mitigation, compensation and/or enhancement measures that are likely to be required to ensure that the proposed development will be acceptable in planning terms and will comply with current wildlife legislation.

2.3.2 This report sets out the results of the survey and, in the context of any known ecological interest identified as a result of the desk study, sets out the approach necessary to ensure that effects on any identified ecologically sensitive receptors are avoided or ameliorated. This will ensure that the proposed development will be acceptable with reference to the planning and legal framework relating to ecological resources.

3 Methods

3.1 Desk Study

3.1.1 Existing ecological information for the site and its surrounding area was requested from the Sheffield Biological Records Centre (SBRC) and West Yorkshire Ecology (WYE). Information relating to great crested newts was requested for the site and land up to 2 km from the site boundary. In addition, on-line resources including the Multi Agency Geographic Information for the Countryside (MAGIC) website (http://magic.defra.gov.uk/) and aerial photography of the area were also reviewed.

3.2 Great Crested Newts

3.2.1 All ponds, where access could be legally gained, were assessed for the presence of great crested newts. As part of the survey a Habitat Suitability Index (HSI) assessment was undertaken, this is a measure of the ponds suitability to support great crested newts (Oldham *et al.* 2000). HSI assessments consider the following:

- Geographic location
- Pond area
- Pond drying
- Water quality
- Shade
- Presence of water-fowl
- Presence of fish
- Number of local ponds
- Terrestrial habitat
- Macrophyte coverage

3.2.2 A survey for amphibians, in particular great crested newts, was undertaken between March and June 2020 by Paul Howden-Leach MCIEEM and Martin Derbyshire ACIEEM, both of whom hold Natural England licenses for great crested newts. The habitats within and adjacent to the site were assessed for their potential to support populations of amphibians according to published guidance. Great crested newts need both aquatic and terrestrial habitat, and the survey area was assessed for suitable areas such as ponds, ditches, rough grassland, woodland, scrub and piles of debris. Ordnance Survey mapping was reviewed to identify the presence of any water bodies within 500m of the site boundary that could be potential breeding sites.

3.2.3 Four great crested newt surveys, using at least three of the five traditional methods, were undertaken to establish presence/absence of the species. Where species were confirmed a further two surveys were undertaken. Methods used were; torchlight surveys, terrestrial searches and egg searches. Table 1 shows the dates, weather conditions and methods used.

Table 1: Great Crested Newt Survey dates and conditions

Date	06/04/20	16/04/20	23/04/20	11/05/20	15/05/20	18/05/20	01/06/20
Ponds Surveyed	1,2,4,6,7, & BC	1,2,4,6,7, 8, 9 & BC	6,7, 8, 9 & BC	6,7, 8, 9 & BC	1, 2, 4, 6, 8 & 9	6, 8 & 9	8 & 9
Weather	Dry with 0% cloud	Dry with 20% cloud	Dry and still 50% cloud	Dry with 0% cloud	Dry and still with 20% cloud	Dry and still 60% cloud	Dry and still 0% cloud
Temp	14°C	13°C	14°C	7°C	13°C	14°C	15°C
Torch	Y	Y	Y	Y	Y	Y	Y
Bottle Trap	N	N	N	N	N	N	N
Net	N	N	Y	Y	N	N	N
Terrest.	Y	Y	Y	Y	Y	Y	Y
Egg Search	Y	Y	Y	Y	Y	Y	Y

3.3 Limitations to Methods

3.3.1 Due to the Covid 19 pandemic current guidance set out by CIEEM stated that bottle trapping should not be used unless the site is close to the ecologist's place of residence and would allow safe return to the study site. In addition, many of the ponds were not suitable for bottle trapping, either because they were classed as being in a public place which would risk traps being tampered with, or were not suitable for bottle trapping because of the depth of the water. This limitation is not seen as significant as data has been shared from a parallel survey being conducted within the same area, resulting in the majority of waterbodies having 12 rather than 6 surveys. In addition, a minimum of three survey methods were still undertaken on each waterbody, in-line with current guidance.

4 Results and Interpretation

4.1.1 This section sets out the findings of the desk study and survey work. Whilst every effort was made to provide a comprehensive description of the site during the field survey, no investigation can provide a complete assessment as the natural environment is difficult to predict and can therefore be subject to potential change.

4.1.2 The results of the surveys should be read in conjunction with the figures and data located in Section 8 and Appendix A of this report.

4.2 Desk study

4.2.1 This section should be read in conjunction with the data search records located in Appendix A of this report.

4.2.2 SBRC provided 100 records of amphibian for the search area, of these 47 are for common toad *Bufo bufo*, and seven are for great crested newts *Triturus cristatus* the closest of which appears to be 50 metres to the east of the site at Rabbit Ings Country Park. WYE did not provide any records for great crested newt for the search area.

4.2.3 Previous surveys undertaken by AES Ltd. Identified that in 2013 the open water/marshy grassland in the north eastern corner (Pond 4) contained a small population of great crested newts. It should be noted that since this survey the dynamics of the site have changed dramatically. This pond identified in 2013 is now more akin to marshy grassland due to the encroachment of willow saplings within the pond.

4.2.4 As well as the above survey in 2009 a European Protected Species Licence (EPSL) was granted within Rabbit Ings Country Park to translocate great crested newts. According to AES Ltd 156 great crested newts were moved as part of this licence. Further monitoring visits in 2013 found great crested newts to be present within ponds associated with Rabbit Ings Country Park, the closest of which is located 40 metres from the eastern boundary of the study site (Pond 6).

Ponds and open water within the site boundary

4.2.5 During the Phase 1 Habitat Survey in 2019 five waterbodies were recorded within the study site. At the time of the 2020 surveys only three of these waterbodies contained water. A plan of all ponds within the study area can be found in Figure 1, Section 8 of this report.

Pond 1

4.2.6 Pond 1 is a former settling lagoon which is split by an internal wall into two parts (Image 1). Small water features connected to the lagoon are also present on the eastern and southern sides (Image 2). The main lagoon is thought to be over three metres deep with steep sided walls. Vegetation within the lagoon was limited to broad-leaved pondweed *Potamogeton natans*. Around the pond are a number of piles of rubble and other building materials (Image 3).

Pond 2

4.2.7 A second settling lagoon is located to the south of Pond 1. This lagoon is shallower than Pond 1, with over a metre of wall between the water surface and top of the embankment (Image 4). Algae was present within this pond during the latter of the evening surveys and the water quality was classed as being poor.

Image 1: Pond 1

Image 2: Connecting water features of Pond 1

Image 3: Habitat piles around Pond 1

Image 4: Pond 2

Pond 3

4.2.8 Pond 3 is a depression within an area of contaminated land (Image 5) which formed a temporary water body. During the initial site visit in November 2019 the pond was full but the water quality appeared to be poor. During subsequent visits to the site throughout 2019 and 2020 the pond was dry, even after periods of heavy rain (Image 6).

Image 5: Pond 3 during visit in November 2019

Image 6: Pond 3 during visit in January 2020

Pond 4

4.2.9 During the initial Phase 1 habitat survey Pond 4 was an area of wet grassland and area of young willow with no areas of open water. In March 2020 this area had a small amount of water within it although the water was limited to a young willow dominated area (Image 7). The pond reduced in size throughout April and dried up completely in June 2020.

Image 7: Pond 4

Image 8: Pond 5

Pond 5

4.2.10 Pond 5 is a concrete feature which was once part of a structure on the site. The pond had no vegetation at the time of survey and only held water during the initial Phase 1 habitat survey in winter (Image 8).

Ponds and open water outside of the site boundary

4.2.11 Current maps and aerial photography of the area records a total of nine waterbodies within 500 metres of the boundary of the study site. Of these five are associated with Rabbit Ings Country Park (Ponds 6 to 10) which has full public access. The former Barnsley Canal located 40 metres to the west of the study site, again could be accessed from the existing tow path. Ponds to the north of the study site (Ponds 11 and 12) and a single waterbody to the west of Barnsley Canal (Pond 13) could not be accessed as permission to access the ponds was not granted.

Pond 6

4.2.12 Pond 6 is located 40 metres to the east of the study site. The pond is approximately 35 by 10 metres and is surrounded with tussocky grassland, tall ruderals and scrub (Image 9). The pond has excellent vegetation within it which is dominated by reedmace, however soft rush, water mint and greater willowherb were also recorded. Around the area specific habitat piles suitable for both reptiles and amphibians have been created.

Pond 7

4.2.13 Pond 7 is a large lake which has been recently created (Image 10). The lake is shallow but does contain fish and large number of waterfowl. The lake is approximately 350 by 100 metres and appears to be relatively shallow around the banks, although is likely much deeper towards the centre of the lake. Surrounding the lake are areas of dense scrub, woodland and drainage ditches. Although some submerged vegetation was recorded the majority of the water body is open water with little macrophytic surface cover.

Image 9: Pond 6

Image 10: Pond 7 (Lake)

Pond 8

4.2.14 Pond 8 is a small pond, approximately 20 by 5 metres, which is completely covered with Reedmace (Image 11). Open water within the pond is limited to small areas between the reedmace stems. The pond has been fenced to reduce disturbance from dog walkers.

Pond 9

4.2.15 Pond 9 is located within 100 metres of Pond 9 and is of similar design to Pond 8. The pond is approximately 15 by 3 meters and although it does have areas of reedmace the pond contains areas of open water (Image 12). The pond is fenced and is surrounded by tussocky grassland, tall ruderals and scattered scrub.

Image 11: Pond 8

Image 12: Pond 9

Pond 10

4.2.16 Pond 10 is a man-made pond within Rabbit Ings Country park. During all survey visits the pond has not held water (Image 13) is has therefore not been considered further in this survey.

Ponds 11, 12 and 13

4.2.17 Ponds 11, 12 and 13 could not be accessed as permission to survey these ponds was not granted.

Image 13: Pond 10

Image 14: Barnsley Canal

Barnsley Canal

4.2.18 Barnsley canal has a range of types of open water. The majority of the canal surveyed has large open areas of water which contain fish and wildlfowl (Image 14), however other sections are much shallower and more densely vegetated (Image 15) and are more akin to swamp habitat. The canal runs adjacent to the site for approximately 1km with varying areas of open water and densely vegetated areas. The Canal is surrounded my mature woodland and dense scrub and has good habitat for amphibians.

Image 15: Barnsley Canal

Image 16: Underpass bridge

Terrestrial Habitat

4.2.19 Terrestrial habitats around all of the ponds are ideal. Ponds 1, 2 and 3 all have rubble piles adjacent to them (Image 3) as well as young birch woodland and abandoned tyres which have now become densely vegetated. Pond 4 is surrounded by dense scrubby vegetation and is close to rubble piles within the wider landscape. Ponds 5 to 9 are all located within Rabbit Ings Country park which is a mix of dense scrub and tussocky grassland, with specific habitat piles created for amphibians and reptiles. There is also an underpass bridge here which connects the site directly with Rabbit Ings Country Park (Image 16).

Habitat Suitability Index of all ponds

4.2.20 A full habitat suitability index (HSI) assessment of all ponds on and off site has been undertaken to ascertain if these water bodies are suitable to support great crested newts (Table 2). A plan of the location of the ponds can be found in section 8.3 (Figure 3) of this report.

Table 2: HSI score for all waterbodies within 500 metres of the study site

Pond ref	Pond 1	Pond 2	Pond 4	Pond 6	Pond 7	Pond 8	Pond 9	Canal
Location	1	1	1	1	1	1	1	1
Pond area	0.8	0.6	0.1	0.2	0.8	0.3	0.3	0.8
Pond drying	0.9	0.9	0.5	1	0.9	1	1	0.9
Water quality	0.33	0.33	0.33	0.67	0.67	0.67	1	0.33
Shade	1	1	0.2	1	1	1	1	1
Fowl	0.67	0.67	1	1	0.01	1	1	0.33
Fish	1	1	1	1	0.33	1	1	0.01
Ponds	1	1	1	1	1	1	1	1
Terr'l habitat	1	1	1	1	1	1	1	1
Macrophytes	0.5	0.3	0.3	0.8	0.5	0.8	1	1
HSI	**0.78**	**0.72**	**0.50**	**0.80**	**0.49**	**0.83**	**0.89**	**0.49**
Pond Suitability	**Good**	**Good**	**Below average**	**Excellent**	**Poor**	**Excellent**	**Excellent**	**Poor**

4.2.21 The results of the HSI show that ponds 6, 8 and 9 have excellent suitability to support great crested newts, ponds 1 and 2 good potential to support great crested newts, with pond 4 having below average suitability and pond 5 and the canal being classed as having poor suitability to support great crested newts.

Presence/absence and Population Survey Results

4.2.22 The tables below (Table 3 and 4) give a summary of the results during the presence/absence and population surveys. Full details of each survey can be found in Appendix B of this report.

Table 3: Amphibian Presence/Absence for all Ponds Surveyed

Pond Number	Presence/Absence				
	GCN	Smooth newt	Palmate newt	Frog	Toad
1	A	P	A	A	P
2	A	A	A	A	A
4	A	A	A	A	A
6	P	P	A	A	A
7	A	A	A	P	A
8	P	P	A	A	A
9	P	P	A	A	A
Canal	A	A	A	A	A

Table 4: Maximum amphibian count for each survey

Pond Number	Summary of total counts of each amphibian species				
	GCN	Smooth newt	Palmate newt	Frog	Toad
1	0	108	0	0	1
2	0	0	0	0	0
4	0	0	0	0	0
6	9	6	0	0	0
7	0	0	0	6	0
8	3	2	0	0	0
9	7	8	0	0	0
Canal	0	0	0	0	0

4.2.23 From the above results no great crested newts have been recorded within the boundary of the site during the survey. However, there are direct links from ponds adjacent to the site, the closest being Pond 6. These (Ponds 6, 8 and 9) ponds have a small population individually but a medium meta population.

4.2.24 The data supplied by Middleton Bell Ecology reinforces these data as similar results were recorded during these survey visit. Full details can be found in Appendix B of this report

5 Legislation and Impacts

5.1.1 Great crested newts and their habitats in water and on land are protected under the Wildlife and Countryside Act 1981 (as amended by the CRoW Act 2000) and under the Conservation of Habitats and Species Regulations 2010. Taken together, these make it an offence to:

a) Deliberately capture, injure or kill a great crested newt;

b) Deliberately disturb any great crested newt, in particular any disturbance which is likely to (i) impair their ability to survive, breed, reproduce or to rear or nurture their young; or in the case of hibernating or migratory species, to hibernate or migrate; or (ii) to affect significantly the local distribution or abundance of the species to which they belong.

c) To be in possession or control of any live or dead great crested newt or any part of, or anything derived from a great crested newt;

d) Damage or destroy a breeding site or resting place of a great crested newt;

e) Intentionally or recklessly obstruct access to any place that a great crested newt uses for shelter or protection;

f) Intentionally or recklessly disturb a great crested newt while it is occupying a structure or place that it uses for shelter or protection.

5.1.2 In addition, great crested newt is a UK Biodiversity Action Plan species and is listed as a Species of Principal Importance under the provisions of the NERC Act 2006.

5.1.3 Great crested newts have been recorded on the study site in the past and currently adjacent to the site during the most recent survey in 2020. As such without appropriate mitigation the proposed development may result in an offence under the above legislation.

6 Impacts and Recommendations

6.1 Amphibians

6.1.1 Prior to any works being completed on the site a Licence will need to be secured from Natural England. Within the licence methodology there will be details on how the site will be trapped out to remove any risk to great crested newts. This is usually in the form of temporary or permanent amphibian fencing with pitfall traps which are checked on a daily basis for a 30 or 60 day period. Any amphibians found will be placed in a receptor site outside of the development footprint. This could be as part of a wildlife scheme within the development or located within Rabbit Ings Country Park (permission would need to be obtained from Rabbit Ings Country Park to allow this).

6.1.2 As a precautionary approach both of the lagoons should be drained under licence and under the supervision of a licenced ecologist. Any amphibians found should be relocated to a suitable receptor site.

6.1.3 During construction, staff will receive a toolbox talk as to procedures to follow if amphibians are discovered during works. This element will also form part of the EPSL from Natural England

6.1.4 To ensure that there is suitable habitat within the study site a wildlife pond will be created on the north west of the site within a designated greenspace, specifically for the purposes of wildlife conservation. Although there will be water features within the site, these will be focusing on a SUDS scheme and not necessarily designed solely for wildlife. Other features such as habitat piles will be placed within these areas to encourage amphibians. The location of the pond within this area will link directly with both the woodland strip to the north (which is to be retained and brought into active management), and the Barnsley Canal and Ellis Laithe LWSs, both of which have wetland areas and both have suitable terrestrial habitat for amphibians.

6.1.5 Potential effects during operation can be avoided through the design of a sensitive drainage system at the detailed design stage to reduce the risk of amphibians being caught in features such as gully pots. This mitigation will focus on areas to the north and east of the site where amphibians are more likely to be encountered. The installation of amphibian friendly gully pots and amphibian underpasses should also be used in areas of the site where amphibians may be encountered.

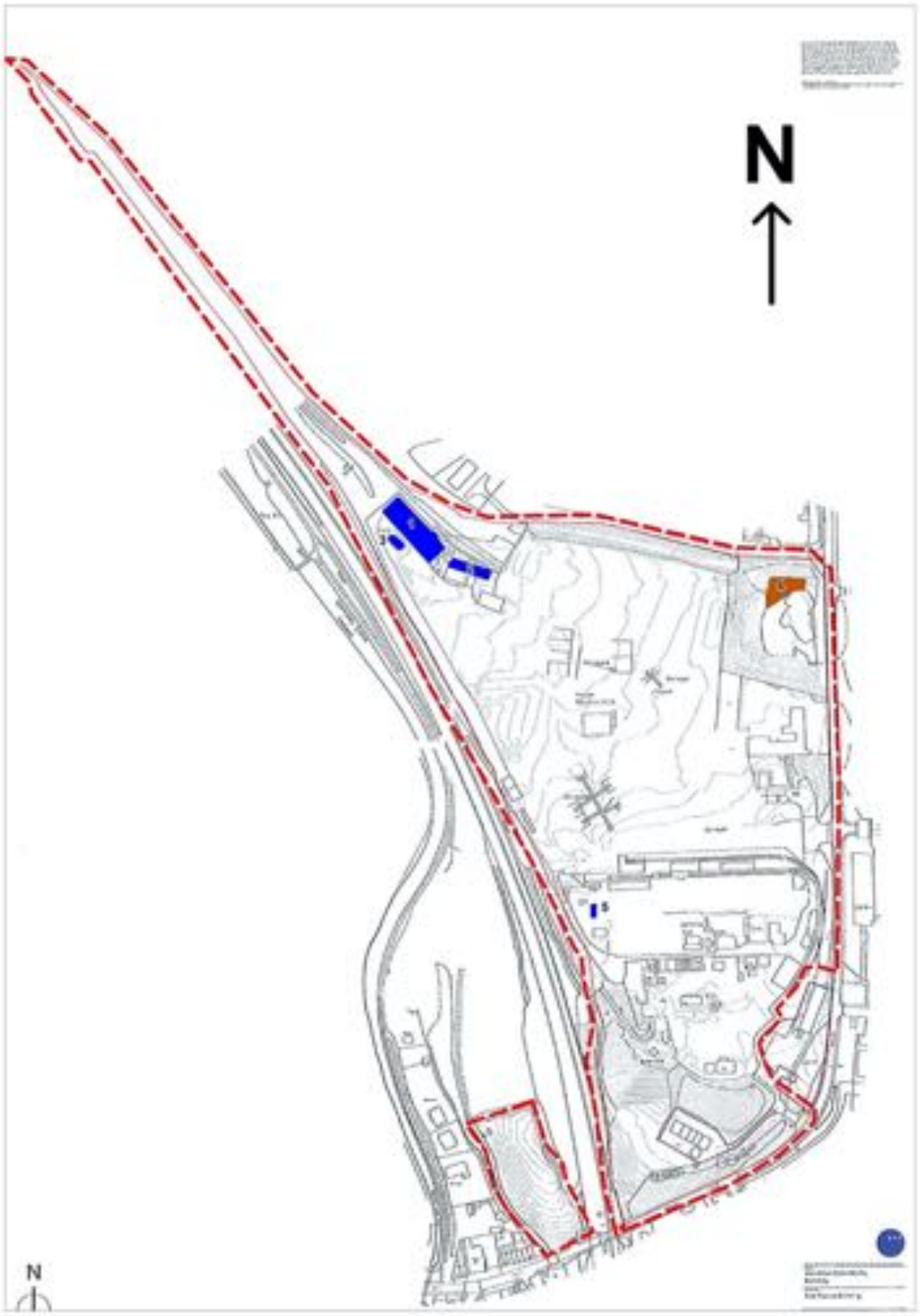
7 References

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

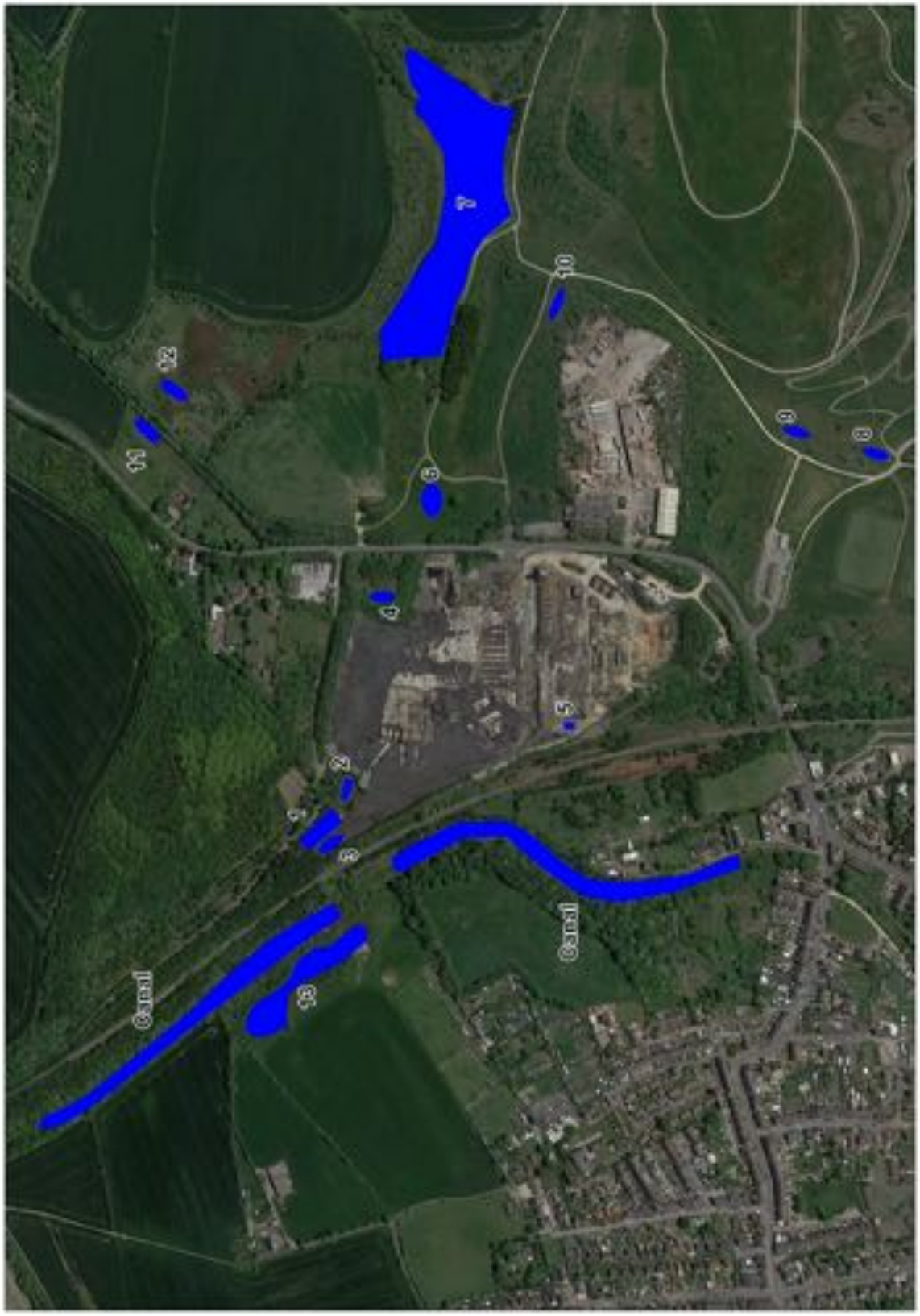
Sewell D, Griffiths R A, Beebee T J C, Foster J and Wilkinson J W (2013) Survey Protocols for the British herpetofauna.

8 Figures

8.1 Figure 1: Pond Numbers within the site boundary



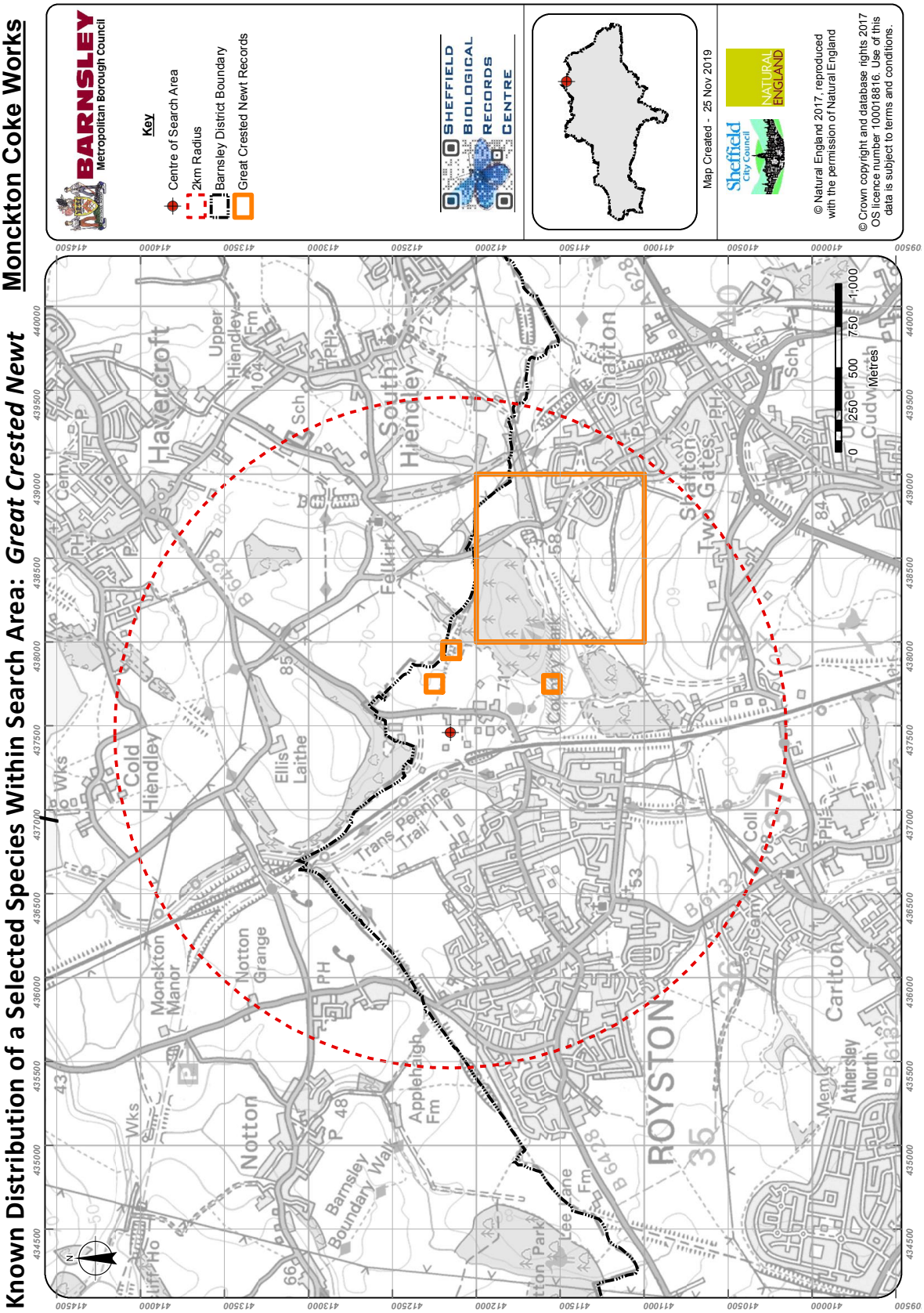
8.2 Figure 2: Pond numbers within and outside the site boundary



Google Images

Appendix A Desk Study Information

Known Amphibian Records Provided by SBRC



Appendix B Great Crested Newt Survey Results

B.1 Skyline Ecology GCN Survey Results

Pond reference:				Method:	Torch GCN			Bottle-trap GCN			Net GCN			Egg search GCN	Larvae GCN	Other amphibians			
Pond 1					Torch power:			No. of traps used in pond:						eggs found?	larvae found? (any method)				
No. of survey visits to this pond:			4		1 million candlepower			0											
				Sex/life stage:	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.			S-Newt	P-Newt	Frog	Toad
(1) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no				
06/04/2020	14	1	2	Adult totals:	0			0			0					33	0	0	0
(2) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no				
16/04/2020	13	1	3	Adult totals:	0			0			0					36	0	0	0
(3) Date:	Air temp	Veg cover	Turbidity		0	0	0				0	0	0	no	no				
23/04/2020	14			Adult totals:	0			0			0					108	0	0	0
(4) Date:	Air temp	Veg cover	Turbidity		0	0	0				0	0	0	no	no				
15/05/2020	7	1	2	Adult totals:	0			0			0					58	0	0	0
(5) Date:	Air temp	Veg cover	Turbidity																
				Adult totals:	0			0			0								
(6) Date:	Air temp	Veg cover	Turbidity																
				Adult totals:	0			0			0								
(7) Date:	Air temp	Veg cover	Turbidity																
				Adult totals:	0			0			0								
(8) Date:	Air temp	Veg cover	Turbidity																
				Adult totals:	0			0			0								
Peak adult count for this pond in any one visit (by torch, trap or net):					0														
Comments and constraints:					Pond is split by central wall with two small waterbodies connected to the east and south. The majority of smoth newts were foumd in these two smaller areas														

Pond reference:				Method:	Torch GCN			Bottle-trap GCN			Net GCN			Egg search GCN	Larvae GCN	Other amphibians			
Pond 2					Torch power:			No. of traps used in pond:						eggs found?	larvae found? (any method)				
No. of survey visits to this pond:			4		1 million candlepower			0											
				Sex/life stage:	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.			S-Newt	P-Newt	Frog	Toad
(1) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no				
06/04/2020	14	1	5	Adult totals:	0			0			0					0	0	0	0
(2) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no	0	0	0	0
16/04/2020	13	1	4	Adult totals:	0			0			0					0	0	0	0
(3) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no	0	0	0	0
23/04/2020	14			Adult totals:	0			0			0					0	0	0	0
(4) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no	0	0	0	0
15/05/2020	7			Adult totals:	0			0			0					0	0	0	0
(5) Date:	Air temp	Veg cover	Turbidity													0	0	0	0
				Adult totals:	0			0			0					0	0	0	0
(6) Date:	Air temp	Veg cover	Turbidity													0	0	0	0
				Adult totals:	0			0			0					0	0	0	0
(7) Date:	Air temp	Veg cover	Turbidity													0	0	0	0
				Adult totals:	0			0			0					0	0	0	0
(8) Date:	Air temp	Veg cover	Turbidity													0	0	0	0
				Adult totals:	0			0			0					0	0	0	0
Peak adult count for this pond in any one visit (by torch, trap or net):					0														
Comments and constraints:					Single toad found during the terretrial search on 06/04/20. Pond appears to be heavily polluted														

Pond reference:				Method:	Torch GCN			Bottle-trap GCN			Net GCN			Egg search GCN	Larvae GCN	Other amphibians			
Pond 4					Torch power:			No. of traps used in pond:						eggs found?	larvae found? (any method)				
No. of survey visits to this pond:			4		1 million candlepower			0											
				Sex/life stage:	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.			S-Newt	P-Newt	Frog	Toad
(1) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no				
06/04/2020	14	1	1	Adult totals:	0			0			0					0	0	0	0
(2) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no				
16/04/2020	13	1	1	Adult totals:	0			0			0					0	0	0	0
(3) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no				
23/04/2020	14	1	1	Adult totals:	0			0			0					0	0	0	0
(4) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no				
15/05/2020	7			Adult totals:	0			0			0					0	0	0	0
(5) Date:	Air temp	Veg cover	Turbidity																
				Adult totals:	0			0			0								
(6) Date:	Air temp	Veg cover	Turbidity																
				Adult totals:	0			0			0								
(7) Date:	Air temp	Veg cover	Turbidity																
				Adult totals:	0			0			0								
(8) Date:	Air temp	Veg cover	Turbidity																
				Adult totals:	0			0			0								
Peak adult count for this pond in any one visit (by torch, trap or net):					0														
Comments and constraints:					During the final survey the pond was completely dry and reamined dry throughout May and June														

Pond reference:				Method:	Torch GCN			Bottle-trap GCN			Net GCN			Egg search GCN	Larvae GCN	Other amphibians			
Pond 6					Torch power:			No. of traps used in pond:						eggs found?	larvae found? (any method)				
No. of survey visits to this pond:			6		1 million candlepower			0											
				Sex/life stage:	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.			S-Newt	P-Newt	Frog	Toad
(1) Date:	Air temp.	Veg cover	Turbidity		1	1	0							no	no				
06/04/2020	14	3	2	Adult totals:	2			0			0					1	0	0	0
(2) Date:	Air temp.	Veg cover	Turbidity		5	4	0							no	no				
16/04/2020	13	4	2	Adult totals:	9			0			0					2	0	0	0
(3) Date:	Air temp.	Veg cover	Turbidity		2	1	0							no	no				
23/04/2020	14	3	2	Adult totals:	3			0			0					1	0	0	0
(4) Date:	Air temp.	Veg cover	Turbidity		1	3	0							no	no				
11/05/2020	7	3	3	Adult totals:	4			0			0					0	0	0	0
(5) Date:	Air temp.	Veg cover	Turbidity		0	0	0							no	no				
15/05/2020	13	3	3	Adult totals:	0			0			0					6	0	0	0
(6) Date:	Air temp.	Veg cover	Turbidity		2	3	0							no	no				
18/05/2020	14	3	3	Adult totals:	5			0			0					5	0	0	0
(7) Date:	Air temp.	Veg cover	Turbidity																
				Adult totals:	0			0			0								
(8) Date:	Air temp.	Veg cover	Turbidity																
				Adult totals:	0			0			0								
Peak adult count for this pond in any one visit (by torch, trap or net):								9											
Comments and constraints:																			

Pond reference:				Method:	Torch GCN			Bottle-trap GCN			Net GCN			Egg search GCN	Larvae GCN	Other amphibians			
Pond 7					Torch power:			No. of traps used in pond:						eggs found?	larvae found? (any method)				
No. of survey visits to this pond:			4		1 million candlepower			0											
				Sex/life stage:	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.			S-Newt	P-Newt	Frog	Toad
(1) Date:	Air temp.	Veg cover	Turbidity																
06/04/2020	14	2	2	Adult totals:	0			0			0					0	0	6	0
(2) Date:	Air temp.	Veg cover	Turbidity																
16/04/2020	13	2	2	Adult totals:	0			0			0					0	0	0	0
(3) Date:	Air temp.	Veg cover	Turbidity																
23/04/2020	14	2	2	Adult totals:	0			0			0					0	0	0	0
(4) Date:	Air temp.	Veg cover	Turbidity																
11/05/2020	7	2	2	Adult totals:	0			0			0					0	0	0	0
(5) Date:	Air temp.	Veg cover	Turbidity																
				Adult totals:	0			0			0								
(6) Date:	Air temp.	Veg cover	Turbidity																
				Adult totals:	0			0			0								
(7) Date:	Air temp.	Veg cover	Turbidity																
				Adult totals:	0			0			0								
(8) Date:	Air temp.	Veg cover	Turbidity																
				Adult totals:	0			0			0								
Peak adult count for this pond in any one visit (by torch, trap or net):								0											
Comments and constraints:					Open lake, containing numerous fish and wildfowl														

Pond reference:				Method:	Torch GCN			Bottle-trap GCN			Net GCN			Egg search GCN	Larvae GCN	Other amphibians			
Pond 8					Torch power:			No. of traps used in pond:						eggs found?	larvae found? (any method)				
No. of survey visits to this pond:			6		1 million candlepower			0											
				Sex/life stage:	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.			S-Newt	P-Newt	Frog	Toad
(1) Date:	Air temp.	Veg cover	Turbidity		2	1	0							no	no				
16/04/2020	13	4	2	Adult totals:	3			0			0					0	0	0	0
(3) Date:	Air temp.	Veg cover	Turbidity		2	1	0							no	no				
23/04/2020	14	4	2	Adult totals:	3			0			0					0	0	0	0
(4) Date:	Air temp.	Veg cover	Turbidity		0	0	0							no	no				
11/05/2020	7	5	4	Adult totals:	0			0			0					1	0	0	0
(4) Date:	Air temp.	Veg cover	Turbidity		0	0	0							no	no				
15/05/2020	13	5	3	Adult totals:	0			0			0					0	0	0	0
(5) Date:	Air temp.	Veg cover	Turbidity		0	0	0							no	no				
18/05/2020	14	5	3	Adult totals:	0			0			0					2	0	0	0
(6) Date:	Air temp.	Veg cover	Turbidity		0	0	0							no	no				
01/06/2020	15	5	1	Adult totals:	0			0			0					0	0	0	0
(7) Date:	Air temp.	Veg cover	Turbidity																
				Adult totals:	0			0			0								
(8) Date:	Air temp.	Veg cover	Turbidity																
				Adult totals:	0			0			0					0	0	0	0
Peak adult count for this pond in any one visit (by torch, trap or net):								3											
Comments and constraints:					Pond choked with Typha														

Pond reference:				Method:	Torch GCN			Bottle-trap GCN			Net GCN			Egg search GCN	Larvae GCN	Other amphibians			
Pond 9					Torch power:			No. of traps used in pond:						eggs found?	larvae found? (any method)				
No. of survey visits to this pond:			6		1 million candlepower			0											
			Sex/life stage:		Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.			S-Newt	P-Newt	Frog	Toad
(1) Date:	Air temp	Veg cover	Turbidity		2	2	0							no	no				
16/04/2020	13	3	2	Adult totals:	4			0			0					6	0	0	0
(3) Date:	Air temp	Veg cover	Turbidity		2	2	0							no	no				
23/04/2020	14	3	2	Adult totals:	4			0			0					1	0	0	0
(4) Date:	Air temp	Veg cover	Turbidity		0	1	0							yes	no				
11/05/2020	7	3	2	Adult totals:	1			0			0					4	0	0	0
(4) Date:	Air temp	Veg cover	Turbidity		4	2	0							no	no				
15/05/2020	13	3	2	Adult totals:	6			0			0					8	0	0	0
(5) Date:	Air temp	Veg cover	Turbidity		5	2	0							yes	no				
18/05/2020	14	3	2	Adult totals:	7			0			0					4	0	0	0
(6) Date:	Air temp	Veg cover	Turbidity		0	1	0							no	no				
01/06/2020	15	3	1	Adult totals:	1			0			0					5	0	0	0
(7) Date:	Air temp	Veg cover	Turbidity																
				Adult totals:	0			0			0								
(8) Date:	Air temp	Veg cover	Turbidity																
				Adult totals:	0			0			0								
				Peak adult count for this pond in any one visit (by torch, trap or net):				7											
	Comments and constraints:																		

Pond reference:				Method:	Torch GCN			Bottle-trap GCN			Net GCN			Egg search GCN	Larvae GCN	Other amphibians			
Canal					Torch power:			No. of traps used in pond:						eggs found?	larvae found? (any method)				
No. of survey visits to this pond:			4		1 million candlepower			0											
			Sex/life stage:		Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.			S-Newt	P-Newt	Frog	Toad
(1) Date:	Air temp	Veg cover	Turbidity		0	0	0												
06/04/2020	14	2	3	Adult totals:	0			0			0					0	0	0	0
(2) Date:	Air temp	Veg cover	Turbidity		0	0	0												
16/04/2020	13	3	3	Adult totals:	0			0			0					0	0	0	0
(3) Date:	Air temp	Veg cover	Turbidity		0	0	0												
23/04/2020	14	3	3	Adult totals:	0			0			0					0	0	0	0
(4) Date:	Air temp	Veg cover	Turbidity		0	0	0												
11/05/2020	7	3	3	Adult totals:	0			0			0					0	0	0	0
(5) Date:	Air temp	Veg cover	Turbidity																
				Adult totals:	0			0			0								
(6) Date:	Air temp	Veg cover	Turbidity																
				Adult totals:	0			0			0								
(7) Date:	Air temp	Veg cover	Turbidity																
				Adult totals:	0			0			0								
(8) Date:	Air temp	Veg cover	Turbidity																
				Adult totals:	0			0			0								
				Peak adult count for this pond in any one visit (by torch, trap or net):				0											
	Comments and constraints:				Unusual habitat with a ix of areas where large fish are present and smaller shallow areas where no fish were recorded. No amphibians recorded along the lnegth of water surveyed.														

B.2 Middleton Bell Ecology GCN Survey Results

Pond reference:				Method:	Torch			Bottle-trap			Net			Egg search	Larvae
Pond 4					Torch power:			No. of traps used in pond:						eggs found?	larvae found? (any
No. of survey visits to this pond:			4		1 million candlepower			N/A							
				Sex/life stage:	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.		
(1) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no
08.04.20	13	2	1	Adult totals:	0			0			0				
(3) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no
15.04.20	13	2	1	Adult totals:	0			0			0				
(4) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no
21.04.20	10	2	1	Adult totals:	0			0			0				
(5) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no
30.04.20	8	2	1	Adult totals:	0			0			0				
Peak adult count for this pond in any one visit (by torch, trap or net):								0							
Comments and constraints:					No GCN found during terrestrial search. Maximum of two smooth newts (1 male, 1 female) recorded on 15.04.20. No other amphibian species recorded.										

Pond reference:				Method:	Torch			Bottle-trap			Net			Egg search	Larvae
Pond 6					Torch power:			No. of traps used in pond:						eggs found?	larvae found? (any
No. of survey visits to this pond:			6		1 million candlepower			15 on 21.04.20 only							
				Sex/life stage:	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.		
(1) Date:	Air temp	Veg cover	Turbidity		1	0	0							no	no
24.03.20	10	2	2	Adult totals:	1			0			0				
(2) Date:	Air temp	Veg cover	Turbidity		6	3	0							no	no
08.04.20	13	2	2	Adult totals:	9			0			0				
(3) Date:	Air temp	Veg cover	Turbidity		5	2	0							no	no
15.04.20	13	2	2	Adult totals:	7			0			0				
(4) Date:	Air temp	Veg cover	Turbidity		2	6	0	0	0	0				no	no
21.04.20	10	2	2	Adult totals:	8			0			0				
(5) Date:	Air temp	Veg cover	Turbidity		5	2	0							no	no
30.04.20	8	2	2	Adult totals:	7			0			0				
(6) Date:	Air temp	Veg cover	Turbidity		2	3	0							no	no
05.5.20	7	2	2	Adult totals:	5			0			0				
Peak adult count for this pond in any one visit (by torch, trap or net):								9							
Comments and constraints:					No GCN found during terrestrial search. Maximum of seven smooth newts (2 male, 5 female) on 15.04.20. No other amphibians recorded										

Pond reference:				Method:	Torch			Bottle-trap			Net			Egg search	Larvae
Pond 7					Torch power:			No. of traps used in pond:						eggs found?	larvae found? (any
No. of survey visits to this pond:			4		1 million candlepower			N/A							
				Sex/life stage:	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.		
(1) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no
24.03.20	10	1	2	Adult totals:	0			0			0				
(2) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no
08.04.20	13	1	2	Adult totals:	0			0			0				
(3) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no
15.04.20	13	1	2	Adult totals:	0			0			0				
(4) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no
21.04.20	10	1	2	Adult totals:	0			0			0				
Peak adult count for this pond in any one visit (by torch, trap or net):								0							
Comments and constraints:					No GCN found during terrestrial search. Maximum of two smooth newts (21.04.20), 23 common toad (24.03.20) and one common frog (15.04.20)										

Pond reference: (below)				Method:	Torch			Bottle-trap			Net			Egg search	Larvae
Pond 8					Torch power:			No. of traps used in pond:						eggs found?	larvae found? (any
No. of survey visits to this pond:			6		1 million candlepower			N/A							
				Sex/life stage:	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.		
(1) Date:	Air temp	Veg cover	Turbidity		4	0	0							no	no
24.03.20	10	2	1	Adult totals:	4			0			0				
(2) Date:	Air temp	Veg cover	Turbidity		2	2	0							no	no
08.04.20	13	3	2	Adult totals:	4			0			0				
(3) Date:	Air temp	Veg cover	Turbidity		2	4	0							no	no
15.04.20	13	3	1	Adult totals:	6			0			0				
(4) Date:	Air temp	Veg cover	Turbidity		1	1	0							yes	no
21.04.20	10	3	1	Adult totals:	2			0			0				
(5) Date:	Air temp	Veg cover	Turbidity		1	0	0							no	no
30.04.20	8	3	3	Adult totals:	1			0			0				
(6) Date:	Air temp	Veg cover	Turbidity		0	1	0							no	no
05.5.20	7	3	3	Adult totals:	1			0			0				
Peak adult count for this pond in any one visit (by torch, trap or net):								6							
Comments and constraints:					No GCN found during terrestrial search. Maximum of eight smooth newts (6 male and 2 female) found during surveys (21.04.20) with a single common toad recorded on 24.03.20 and a single common frog on 08.04.20										

Pond reference:				Method:	Torch			Bottle-trap			Net			Egg search	Larvae
Pond 9					Torch power:			No. of traps used in pond:						eggs found?	larvae found? (any
No. of survey visits to this pond:			6		1 million candlepower			N/A							
				Sex/life stage:	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.		
(1) Date:	Air temp	Veg cover	Turbidity		1	0	0							no	no
24.03.20	10	2	1	Adult totals:	1			0			0				
(2) Date:	Air temp	Veg cover	Turbidity		0	3	0							no	no
08.04.20	13	2	2	Adult totals:	3			0			0				
(3) Date:	Air temp	Veg cover	Turbidity		0	3	0							no	no
15.04.20	13	2	1	Adult totals:	3			0			0				
(4) Date:	Air temp	Veg cover	Turbidity		5	1	0							no	no
21.04.20	10	2	1	Adult totals:	6			0			0				
(5) Date:	Air temp	Veg cover	Turbidity		3	2	0							yes	no
30.04.20	8	2	1	Adult totals:	5			0			0				
(6) Date:	Air temp	Veg cover	Turbidity		5	0	0							no	no
05.5.20	7	3	1	Adult totals:	5			0			0				
Peak adult count for this pond in any one visit (by torch, trap or net):								6							
Comments and constraints:					No GCN found during terrestrial search. Maximum of 14 smooth newts (6 male and 8 female) found during surveys (08.04.20) with no other amphibians recorded										

Pond reference:				Method:	Torch			Bottle-trap			Net			Egg search	Larvae
Pond 11					Torch power:			No. of traps used in pond:						eggs found?	larvae found? (any
No. of survey visits to this pond:			4		1 million candlepower			N/A							
				Sex/life stage:	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.		
(1) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no
24.03.20	10	1	2	Adult totals:	0			0			0				
(2) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no
08.04.20	13	2	2	Adult totals:	0			0			0				
(3) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no
15.04.20	13	2	2	Adult totals:	0			0			0				
(4) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no
21.04.20	10	2	2	Adult totals:	0			0			0				
Peak adult count for this pond in any one visit (by torch, trap or net):								0							
Comments and constraints:					No GCN found during terrestrial search. No other amphibian species seen.										

Pond reference:				Method:	Torch			Bottle-trap			Net			Egg search	Larvae
Pond 12					Torch power:			No. of traps used in pond:						eggs found?	larvae found? (any
No. of survey visits to this pond:			4		1 million candlepower			N/A							
				Sex/life stage:	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.		
(1) Date:	Air temp	Veg cover	Turbidity		0	0	0							no	no
24.03.20	10	1	2	Adult totals:	0			0			0				
Peak adult count for this pond in any one visit (by torch, trap or net):								0							
Comments and constraints:					No GCN found during terrestrial search. No other amphibian species seen. Pond dry by Visit 2.										