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Cambridgeshire Amphibian Survey Report 2014

Steven J. R. Allain & Mark J. Goodman

Introduction

The Cambridge Amphibian Survey 2014 was a larger scale continuation of a smaller pilot study carried out in 2013, wherein a number of bodies of freshwater were surveyed for signs of amphibians. From the 2013 pilot, we deemed the three sites surveyed that year were suitable for further study. We also carried out a number of surveys at four new locations; these were discovered by following up reports we had received.

The surveys were designed to meet standardised guidance protocols (Griffiths *et al.*, 1996; Sewell *et al*., 2013) and were carried out weekly (weather permitting). On nights when it was extremely windy or there was heavy rain, surveying did not take place because the disturbance of the water surface obstructed the view of the surveyors. This precaution was also taken for the surveyors' safety. The surveys were carried out weekly to help provide more extensive information on the population sizes of native amphibians within Cambridgeshire. Amphibians within Cambridgeshire are under recorded so one aim of this study was to educate local residents on the importance of recording local species.

Seven sites (Figure 1) were surveyed, mostly after nightfall by torchlight, and the detected presence of amphibian species was recorded, along with the occurrence of fish and the number of frog spawn clumps. Other factors that were also analysed were the pond's suitability to sustain Great Crested Newts.

All seven sites surveyed contained evidence of amphibians but not all of them were suitable for further study. The sites were surveyed with the help of trained volunteers who were members of the Cambridgeshire and Peterborough Amphibian and Reptile Group (CPARG).

The species focused on in this study were the most common of the native amphibian species found in Cambridgeshire, the Common Frog (*Rana temporaria*), the Common Toad (*Bufo bufo*), the Smooth Newt (*Lissotriton vulgaris*) and the Great Crested Newt (*Triturus cristatus*).

Methods

Survey locations (see Figure 1)

Site 1: Cambridge City Crematorium (TL39906258)

The City Crematorium has a total of six ponds, of which we only surveyed four on a regular basis. The four surveyed were the same as those the year before. Two are 12 x 16 feet and the other two are 16 x 16 feet. Although they are all concrete lined with small areas of refugia in the corners, they support a high diversity of pond life.

Site 2: Cherry Hinton Brook (TL47715728)

Cherry Hinton Brook, as its name suggests runs through Cherry Hinton, behind the Hall. We focused on the stretch between Burnside Road and the allotments just past St. Bede's Infant School. This site had been surveyed the year before as part of the pilot, where toads were found.

Site 3: Chesterton (TL46485957)

This site consists of a man-made waterway that has been built behind a block of flats on the old Phillips/Simocco site. We were alerted to the presence of newts at the site by some friends who had seen some dead Smooth Newts on a path nearby. After some further investigation we found the man-made waterway which appeared to have a healthy population of amphibians. The site is not very far from the River Cam or Logan's Meadow LNR.

Site 4: Cottenham Amenity Pond (TL44866834)

The Amenity Pond was discovered using maps when trying to find out more about the moat nearby in Cottenham. Some other bodies of water including drainage ditches which are close by were also inspected but these were deemed unsuitable for sustaining amphibians. The pond has a high abundance of emergent vegetation around its perimeter, as well as submerged vegetation within the pond.

Site 5: Cottenham Moat (TL44936807)

Cottenham Moat was investigated further after reports from a friend that he had seen Great Crested Newts at the site when he used to live close by. On further investigation it was discovered that the site did support a population. The moat is a broken 'U' shape, contains no fish and is sometimes covered by a film of duckweed.

Site 6: Logan's Meadow LNR (TL46385925)

Logan's Meadow LNR is located in Chesterton, along the River Cam and quite close to our already established Chesterton newt population. We decided to survey the site after discovering that it contained two ponds and that those ponds were partially connected to the Chesterton population of newts by ditches.

Site 7: Stow-cum-Quy Fen (TL51366270)

Stow-cum-Quy Fen is located between Waterbeach and Horningsea, off Harcamlow Way. Again, this site is one that we surveyed the year before as part of the 2013 pilot. We had been unable to detect any adults in the previous year but we did discover a large population of tadpoles and so decided to investigate further.

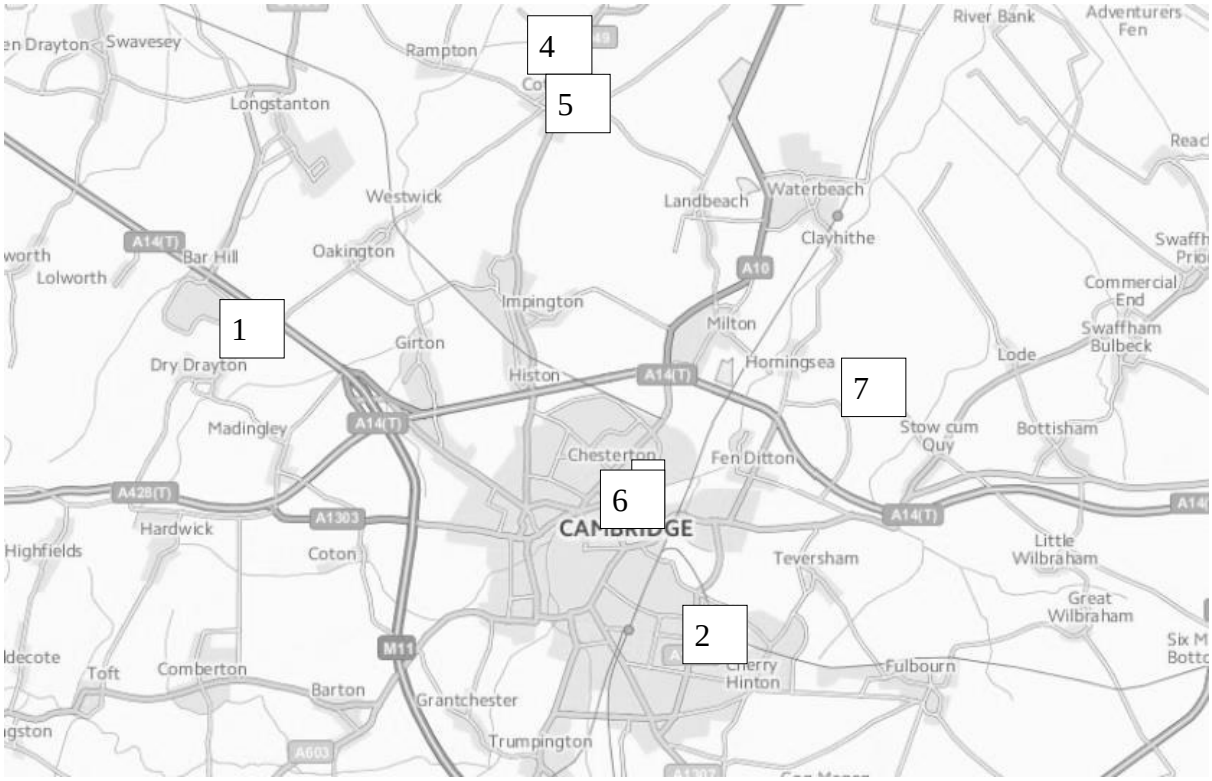

Figure 1. Map of Cambridge, numbers indicate where the seven sites are located.

Survey Protocol

On arrival at the sites after dark, volunteers were run through the risk assessment for each site before any surveying was undertaken. Once everyone was aware of the risks and knew what to be on the lookout for, one person among the group was elected to be the data recorder. They were given a clipboard with a data recording form and a pencil; from now on they would be noting down any sightings other volunteers would be gently calling to them.

All of the sites were surveyed by shining 160 lumen torches from the bank and into the water. The torches were shone up to about 3m into the pond (if it was large enough) where the light allowed amphibians to be detected at the water's surface. Closer to the bank, the torch beams cut much more deeply into the water and so more amphibians were likely to be detected. This method was reliable for detecting newts and other amphibians within ponds that had little vegetation or those that were shallow. For deeper areas, two or more torches

were used to converge the beams to give the column of light a better chance of penetrating the surface.

At sites where there is only a single body of water, these were approached from a bottom corner closest to the point of entry, e.g. a footpath. From this corner, the perimeter of the body would be surveyed including up to 3m away from the bank. At locations where there was more than one body of water, the ponds the furthest away ponds were scanned first. This was designed to help minimise our effect on ponds which had not yet been surveyed. Any amphibians found within a 3m 'buffer zone' were also included in the counts.

At some sites where the vegetation grows close to the banks, or when the ponds were shallow due to evaporation, egg-searching was undertaken. This involves searching submerged vegetation for folded leaves indicating presence of newt eggs.

A 4 in 1 multifunctional environmental tester was used to gather water and air temperature data at the sites surveyed (when available).

Results

Signs of amphibians were discovered at all seven of the survey sites in the form of adults. At six of the sites these included visual evidence of frogs and at the last site, Cottenham Amenity Pond, the evidence of frogs was their calls. As a sizeable proportion of the pond was not surveyed due to the growth of reeds and other aquatic vegetation, it was decided that the pond was not suitable for any further visual analysis in coming years.

Large numbers of frog spawn clumps were observed at two of the sites, Chesterton (see Fig. 2) and Stow-Cum-Quy Fen, but there were still no signs of any toad spawn, despite observing numbers of pairs of toads in amplexus. It is therefore possible that as we have missed toad spawn two years in a row that the toads lay their spawn more discreetly than Common Frogs do at the sites we have been monitoring. Alternatively toad spawn may been consumed by predators such as the Great Crested Newt between our weekly site visits. Despite observing newts performing egg laying behaviours at Cambridge City Crematorium and Cottenham Moat, no newt eggs were discovered through our searches.

Figure 2. The Chesterton site at night on the evening we came across 181 clumps of frog spawn.

Peak Count Data

Date	**Species**	**Peak Count**	**Avg. Air Temp (°C)**	**Avg. Water Temp (°C)**
19/06/2014	Common Frog	8	11.2	14.4
24/02/2014	Common Toad	93	10.0	7.3
24/02/2014	Great Crested Newt	156	10.0	7.3
24/02/2014	Smooth Newt	55	10.0	7.3

Table 1. Summary of data collected at Site 1, Cambridge City Crematorium. Average air temperature is based on data collected from the four ponds on a single evening.

Date	**Species**	**Peak Count**	**Air Temp (°C)**	**Water Temp (°C)**
07/03/2014	Common Frog	11	5.0	10.6
07/03/2014	Common Toad	9	5.0	10.6

Table 2. Summary of data collected at Site 2, Cherry Hinton Brook.

Date	**Species**	**Peak Count**	**Air Temp (°C)**	**Water Temp (°C)**
12/03/2014	Common Frog	220	7	9
06/03/2014	Common Toad	8	9.6	9.1
28/04/2014	Smooth Newt	56	10.3	11.8

Table 3. Summary of data collected at Site 3, Chesterton.

Date	Species	Peak Count	Air Temp (°C)	Water Temp (°C)
13/03/2014	Common Frog	1	3.9	8
27/04/2014	Common Toad	1	12.2	13.6
22/02/2014	Great Crested Newt	142	N/A	N/A
13/03/2014	Smooth Newt	94	3.9	8

Table 4. Summary of data collected at Site 5, Cottenham Moat.

Date	Species	Peak Count	Avg. Air Temp (°C)	Water Temp (°C)
28/04/2014	Smooth Newt	12	10	11

Table 5. Summary of data collected at Site 6, Logan's Meadow LNR.

Date	Species	Peak Count	Avg. Air Temp (°C)	Avg. Water Temp (°C)
11/03/2014	Common Frog	5	3.5	8.5
24/03/2014	Common Toad	81	N/A	N/A
11/03/2014	Smooth Newt	4	3.5	8.5

Table 6. Summary of data collected at Site 7, Cambridge Stow-Cum-Quy Fen.

HSI Scores

The Habitat Suitability Index (HSI) is a scoring system that analyses 10 points of a habitat in order to establish whether or not that habitat is suitable for great crested newts (Oldham *et al*., 2000). The scoring system works by giving the 10 points listed below a number between 0 and 1. The mean of these are then calculated to give the HSI of the pond or water body being studied.

SI1 = The pond's/water body's geographical location.
SI2 = The surface area of the pond/water body.
SI3 = The permanence of the pond/water body.
SI4 = The water quality of the pond/water body.
SI5 = The total area of shading on the pond/water body.
SI6 = The number of waterfowl on the pond/water body.
SI7 = The occurrence of fish in the pond/water body.
SI8 = The density of ponds surrounding the one you are studying.
SI9 = The proportion of newt friendly habitat surrounding the pond being studied.
SI10 = The total macrophyte cover in the pond/water body.

The equation used to work out the HIS for a pond using these 10 points is:

$$HSI = (SI1 \times SI2 \times SI3 \times SI4 \times SI5 \times SI6 \times SI7 \times SI8 \times SI9 \times SI10)^{1/10}$$

Location	Score	Rank
Cambridge City Crematorium*	0.66	Above Average
Cherry Hinton Brook*	0.71	Good
Chesterton	0.77	Good
Cottenham Amenity Pond	0.86	Excellent
Cottenham Moat	0.81	Excellent
Logan's Meadow LNR	0.66	Above Average
Stow-Cum-Quy Fen*	0.79	Good

Table 7. Table showing the HSI scores and ranks of the seven locations surveyed. Scores were calculated using knowledge of the ponds location and ecology that was built up over the duration of the survey period. Locations labelled with an asterisk mean the HSI scores have been taken from the 2013 Cambridge Amphibian Report.

Discussion

Using Table 4, we can clearly see that Cottenham Moat contains a large population of Great Crested Newts. Cottenham Moat also has the second highest calculated HSI score; the highest is held by the Cottenham Amenity Pond. The two bodies are quite close and so the Amenity Pond could have been colonised by newts from the moat. Due to the large quantities of emergent vegetation described above it was extremely difficult to survey the pond; if we manage to survey the pond earlier in the seasons to come when the plants haven't grown as much we may find evidence of Great Crested Newts.

All of the sites had HSI scores above average, meaning that potentially they are all suitable for Great Crested Newts to inhabit; one of the main limiting factors will be the presence of fish (Oldham *et al*., 2000). Later on in the surveys, sticklebacks were seen at the Chesterton site for the first time, it is possible that they had been introduced by the flooding of one of the brooks that run alongside, into the Cam.

Another factor that will affect the distribution of amphibians is the permanence of ponds, as permanent sites are needed for amphibians to breed (Semlitsch, 2008). At Logan's Meadow LNR, one of the two ponds repeatedly dried out despite large amounts of rainfall. The other pond however was permanent and we were able to carry out our weekly survey on it.

During 2013, MJG thought he might have seen a Smooth Newt whilst surveying at Cherry Hinton Brook but, as he had never seen one there before, he assumed it was a fish. During one of the 2014 surveys, we checked Burnside Road for signs of amphibians by checking the road for dead individuals. It was then that we noticed a dead Smooth Newt that had been hit by a car. Although it was through a dead individual, Smooth Newt presence at Cherry Hinton Brook has now been confirmed.

On investigation, the dead newt our friend reported at Chesterton to us wasn't the only one. Cyclists had managed to kill around a dozen within a short period of time. This is an area of study that we would like to pay more attention to in

the future, along with surveying more sites for amphibians and attempting to reconfirm old reports of amphibians at a number of locations.

At the end of the project all records were submitted to the Cambridgeshire and Peterborough Environmental Records Centre (CPERC).

Acknowledgments

The continued surveying and monitoring of amphibians at the sites mentioned in this report couldn't be done without the dedicated volunteers that have supported us no matter what the weather. We would like to thank them for their continued effort and professionalism when in the field. We would also like to thank our network of friends who continually surprise us with information leading to the discovery of potential new survey sites.

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Lichenology in Cambridgeshire – progress and problems with particular reference to the lichens of Orwell church and churchyard

Mark Powell and the Cambridge Lichen Group

Introduction

The Cambridge Lichen Group (CLG) was formed in 2008 with the primary aim of surveying sites in this formerly neglected area. In our first six years we have witnessed surprisingly rapid changes, especially in the lichen communities on tree bark. We have strayed into neighbouring counties including Hertfordshire where *Lecania coeruleorubella*, one of Natural England's 'lost species', was found in the mortar courses of a parish church. Our initial aspiration was limited to conducting competent surveys of local sites but we have found that our observations and specimens have also contributed to the taxonomic understanding of common lowland lichens. *Verrucaria ochrostoma* was considered to be a rare species in Britain before we learned how to recognise it and showed that it is actually a common colonist of calcareous substrata. It was tempting to think, on the publication of the new British lichen