

2 - review the surveyor training and the survey form to make the survey easier to carry out and report on, including in a number of cases making the access details clearer.

3 – monitor particular key areas over the next few years.

4 - communicate with neighbouring counties to create a wider Otter map.

5 - as the presence of Otters in the Middle Level is continuing, maintain the artificial holts where necessary to maintain that presence.

6 - remove from the list of sites those which have become permanently inaccessible for one reason or another (including fencing off by a fishery or removal).

The survey was co-ordinated by the Wildlife Trust for Bedfordshire, Cambridgeshire and Northamptonshire using surveyors from the Wildlife Trust and the Cambridgeshire Mammal Group with other volunteers.

Further information may be found in the previous survey report, not specifically cited in the text: **Pilbeam, P. G.** (2013). Cambridgeshire and Peterborough Otter Survey - 2012. *Nature in Cambridgeshire* **55**:44-46.

Cambridge Amphibian Survey Report 2016

Steven J. R. Allain & Mark J. Goodman

Introduction

The Cambridge Amphibian Survey 2016 was part of a long-term study in which we monitored the populations of amphibians across a small number of sites. This year was the fourth year that the project was carried out, although it was scaled back slightly compared to previous years (such as 2015). The goal of the ongoing project is to survey bodies of freshwater for signs of amphibians and gather long-term data on population trends. The main technique involves searching for adult amphibians, using night-time surveys in the breeding season between March and June (although some preliminary surveys were undertaken to check for early signs of activity). Additionally, other signs of amphibians (eggs and larvae) are also searched for as they can often be found in ponds when the adults themselves have mostly dispersed into the terrestrial environment.

Method

The project is designed to meet standardised guidance protocols (Griffiths *et al.*, 1996; Sewell *et al.*, 2013) and surveys were carried out weekly depending on the weather. On nights when it was extremely windy or there was heavy rain, surveying did not take place due to the effect of disturbance from surveyors, and for the safety of ourselves and our volunteers. Surveys were carried out weekly to help create a more extensive synopsis of the population sizes of native amphibians within Cambridgeshire. This was also completed to gain a better understanding of peak migration patterns towards ponds; the data from the long term study will

hopefully inform us about long-term patterns. As with previous years, amphibians within Cambridgeshire are under recorded so one aim of this study was to educate residents on the importance of recording local species.

Four sites were surveyed, mostly after nightfall by torchlight, and amphibians were recorded, along with the occurrence of fish and the size and number of Common Frog spawn clumps. The pond's suitability to sustain Great Crested Newts was also assessed. The sites were surveyed with the help of trained volunteers who were members of the Cambridgeshire and Peterborough Amphibian and Reptile Group (CPARG). Our surveys also allow for the training of additional volunteers, who can then go off and replicate similar surveys within the county.

The species focused on in this ongoing study are 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*).

Survey locations

Site 1: Barnwell East Local Nature Reserve (TL47935831)

Barnwell East is a Local Nature reserve (LNR) near Cambridge Airport; it has one pond. This pond has a decking platform allowing access to one area, which is where most of the surveying was concentrated. Accessible areas around the pond were also surveyed but the entire pond was not accessible due to overgrown vegetation. The rest of the site consists of a mixture of woodland, scrubland and open grassland. Due to the location of the pond it is susceptible to eutrophication which may increase the amount of algae available for amphibian larvae.

Site 2: Bramblefields Local Nature Reserve (TL47256064)

Bramblefields is a 2.1 hectare LNR in Chesterton, Cambridge. The site is in the middle of a residential area and has a mosaic of habitats including grassland, scrub and a single pond. The reserve is adjacent to some allotments and itself is the site of previous farmland and allotments that has been transformed into a nature reserve. This was the first year that we surveyed the reserve after receiving reports of abundant amphibians being present. The reserve pond was our survey focus.

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/Simoco site. We were alerted by friends who had seen some dead Smooth Newts on a path nearby. After further investigation we found the man-made waterway which appeared to have a healthy population of amphibians. The site is not too far from the River Cam or Logan's Meadow LNR.

Site 4: Regatta Court (TL46685951)

Regatta Court is a small managed housing complex located by the River Cam, off Newmarket Road. The site has a single large concrete lined pond which is

home to fish as well as amphibians. (**Plate 1**, inside front cover). The site was surveyed after we received reports of large numbers of toads in the area. The pond backs onto Stourbridge Common LNR meaning dispersal for amphibians is relatively easy. The area is also a registered toad crossing site and so some of our time was spent helping toads to cross the roads to their breeding pond.

Survey Protocol

All of the sites were surveyed by shining 160 lumen torches from the bank and into the water. The torches were shone to about three metres across the pond, if it was large enough, where the light beam was used to detect amphibians at the water's surface. Closer to the bank, the light 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 light beams to give the column of light a better chance of penetrating the water.

The perimeter of each waterbody was surveyed including a buffer zone of approximately two metres around body of water. This was designed to count any amphibians that may have left the water body on our arrival due to disturbance. Any amphibians found within the buffer zone were also included in the counts. At some sites egg-searching was undertaken if the habitats were favourable, e.g. vegetation growing close to the banks. This involved searching submerged vegetation for folded leaves indicating presence of newt eggs. A 4-in-1 multifunctional environmental tester was used, when available, to gather water and air temperature data at the sites surveyed.

Results

Adult amphibians were discovered at three of the four sites. At the three sites where amphibians were found, breeding behaviour was observed although no newt eggs were found during any of the searches.

Peak Count Data

Site	Date	Species	Peak Count	Air Temperature (°C)	Water Temperature (°C)
Bramblefields	20/03/2016	Smooth Newt	40	N/A	N/A
Chesterton	28/02/2016	Common Frog	3	N/A	N/A
Chesterton	21/02/2016	Common Toad	6	N/A	N/A
Chesterton	21/04/2016	Smooth Newt	5	10.7	10
Regatta Court	01/03/2016	Common Frog	5	9.3	8
Regatta Court	21/02/2016	Common Toad	139	14	11.5
Regatta Court	21/04/2016	Smooth Newt	2	11.7	12.5

Table 1. Summary of data collected at the three sites. At one of the four sites surveyed, no amphibians were recorded in 2016.

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 geometric mean of these is 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 HSI for a pond using these 10 points is:

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

Location	Score	Rank
Barnwell East LNR*	0.74	Good
Bramblefields LNR	0.74	Good
Chesterton*	0.77	Good
Regatta Court*	0.70	Good

Table 2. Table showing the HSI scores and ranks of the four locations surveyed. Scores were calculated using knowledge of the ponds, their location and ecology which has been built up over the duration of the project period. Locations labelled with an asterisk indicate that the HSI scores have been taken from the 2015 Cambridge Amphibian Report (Allain & Goodman, 2017).

Discussion

Cambridge City Crematorium was not surveyed in 2016 due to extensive management work that was carried out at the beginning of the year. Due to the high levels of disturbance and removal of material, it was decided that the site would next be surveyed again in 2017 to let the ponds recover from the work undertaken.

During surveys at Bramblefields LNR, two dead Smooth Newts were found and collected for post-mortem analysis. These were sent to ZSL London Zoo and analysed as part of the Garden Wildlife Health initiative. Thankfully the newts were found to have died of natural causes. The only amphibians seen at Bramblefields LNR were Smooth Newts and with a peak count of 40, the population is relatively large for a small pond. Our only concern is that as the

pond is not permanent in future years it may dry out threatening the survival of larvae. No Common Frogs or Common Toads were seen on surveys despite there being an abundance of suitable vegetation surrounding the rest of the site.

Despite numerous surveys, no amphibians were found at Barnwell East LNR. We were surprised at this as there had been an abundance of Common Toads and Smooth Newts there in 2015, when we first started surveying the site. Their absence may have been due to the fact that the pond itself was heavily shaded and had become eutrophicated. To help combat this, some maintenance work was scheduled for the early part of 2017.

There was a reduction in frogspawn at Chesterton from the volumes we have seen in the past. This may be part of a trend but 2016 was the lowest count at just three clumps of spawn. Like most of our native amphibian species, Common Frogs may not breed every year due to the huge metabolic investment needed to produce a clump of spawn.

Frogspawn was however seen in abundance at Regatta Court but counting clumps accurately was made difficult by the density of the vegetation. For the second year in a row, toadspawn was also found during surveys at Regatta Court which is a promising sign that this population is thriving as indicated by the peak count of 139 individuals (of which the majority were males).

All of the sites had HSI scores above average (0.6 – 0.69), 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). Unfortunately it is known that sticklebacks are present at the Chesterton site which may have a negative effect on local amphibian populations including deterring Great Crested Newts from colonising the area (if a local metapopulation is ready to expand). Another factor that affects the distribution of amphibians is the permanence of ponds, as these are needed for amphibians to breed (Semlitsch, 2008). Another factor which is considered as part of the HSI score is the number of local ponds in the area, as these may be utilised by amphibians as stepping stones between breeding ponds or hibernation sites.

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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New records of Palmate Newts (*Lissotriton helveticus*) in Cambridge

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Palmate Newts (*Lissotriton helveticus*) are relatively rare in Cambridgeshire with only a few isolated populations known to exist within the county. They are the smallest of the native UK newt species (Beebee & Griffiths, 2000) and prefer acidic bodies of water that are usually associated with heathland and moorland (Inns, 2009). One reason Cambridgeshire is lacking in Palmate Newts may be a lack of suitable habitat. Nonetheless, populations do occur and new ones are being discovered. The species may be more abundant than previously thought due to confusion with Smooth Newts (*L. vulgaris*). The two species are very similar in size and colouration, with the females being almost identical from a dorsal viewpoint. This confusion may lead to Palmate Newt populations erroneously being misidentified as Smooth Newts, which are far more common and widespread within Cambridgeshire.

We report on a newly discovered population of Palmate Newts (**Plate 2**, inside front cover) found in the gardens of private residences in central Cambridge. The newts were first seen on the 21st May 2017 whilst conducting a Midwife Toad (*Alytes obstetricans*) survey. Three individuals were observed in a garden pond whilst dipping in the hope of finding the larvae of the Midwife Toad. The three individuals captured were two males in full breeding condition and a female. Two days later, on the 23rd May, three more Palmate Newts were observed in a neighbouring pond. This time there was only one male, but two females. All of the Palmate Newts found were visually checked over for any signs of disease or ill health, before being photographed and returned to the ponds from which they were removed.

Surveys of the gardens where the newts were found have been made since the spring of 2015 (Allain & Goodman, 2017). These two instances are the only times in which we have found Palmate Newts within the ponds or in the gardens. Other amphibians inhabiting the area include the Common Frog (*Rana temporaria*) and the Common Toad (*Bufo bufo*) as well as the species listed above. These are the first records of Palmate Newts for central Cambridge and they were found in the