

# Using call playbacks to investigate a population of non-native midwife toads *Alytes obstetricans* (Laurenti, 1768) in Cambridge, UK

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**ABSTRACT** - We report on a lesser known midwife toad (*Alytes obstetricans*) population within central Cambridge, England, UK with an initial investigation of the population's extent. In order to achieve this we used call playbacks to locate and count individual toads which responded with a return call.

## INTRODUCTION

The common midwife toad (*Alytes obstetricans*) is a widespread anuran found throughout most of western Europe (Gasc et al., 1997). This species, although not native to Britain, can be found in isolated populations across England (Fig. 1) due to the presence of escaped pets and intended releases (Muir-Howie, 2007). *A. obstetricans* are nocturnal and do not congregate around breeding ponds like the native UK amphibian species (Beebee & Griffiths, 2000). There is a need to monitor the impacts of non-native species such that intervention to prevent them from causing damage or harm to local species and ecosystems can be enacted where necessary (Manchester & Bullock, 2000); for such a secretive species an unusual method was developed to aid in this. A population of *A. obstetricans* is known from central Cambridge, England (Baker, 2007), and the aim of this study was to determine the range of toads in this area using recorded call playback and toad response to estimate the number of calling males. This is an established method in other demographic studies in a variety of species (e.g. Lor & Malecki, 2002; Sung et al., 2005) but relatively novel in terms of amphibians. This method was combined with active searches in order to locate females, juveniles and non-calling males. Our method was combined with the aim of trying to establish the full extent of the Cambridgeshire population, the expected hypothesis was that the toads occurred within all of the gardens of the houses of our survey area.

## METHODS

Communication with local residents identified an area in which *A. obstetricans* was most likely present. To gain access to the properties for surveying, we performed an informative mail drop after reports from a successful outreach and social media campaign. This established the presence of *A. obstetricans* in a smaller area than previously hypothesised. The Dragon Finder App from Froglife, UK, was used to play a pre-recorded mating call of male midwife toads. Both an



**Figure 1.** A map of the known UK distribution of midwife toads

Apple iPhone 5 and iPhone 6S were used to play the call using the app in order to elicit a response from males within our search area, which we hoped would illicit a response. Surveys were undertaken during 2015 and 2016 in the summer and autumn months. When a toad was discovered, dorsal photographs of each individual were taken. Toads could then be individually recognised by the manual comparison of these photos.

## RESULTS & DISCUSSION

During the 2015 season we made six visits to the gardens of three houses between the 26th July 2015 and 6th October 2015; this is not the peak breeding season. In 2016 we returned four more times between 14th June and 22nd August. Using the MAGIC Map Application and its measuring tool, we estimated the overall extent of the population to be 2200 m<sup>2</sup>.



**Figure 2.** An individual of *A. obstetricans* from the Cambridge population

On July the 26th of July 2015 we observed one male carrying a string of approximately 16 eggs; tadpoles have never been observed by us at any of the sites. In 2016, we used the same methodology and over the course of four visits we were able to locate a total of seven toads. We were able to confirm that the toads (Fig. 2) were present in the rear gardens of two rows of parallel Victorian houses in the heart of the city. No tadpoles of *A. obstetricans* were found. The larvae have been known to overwinter in the UK but we found no evidence of this during our surveys in the winter months. The gardens were also home to the common frog (*Rana temporaria*), common toad (*Bufo bufo*) and smooth newt (*Lissotriton vulgaris*).

As in other populations of *A. obstetricans* in the UK, the Cambridge population is small, localised and present in a highly urbanised environment (Beebee & Griffiths, 2000). The local distribution is more restricted than previously thought, with the toads occurring within only one third of the area we originally expected them to occupy; therefore we accept the null hypothesis. This expected range was based on the communication with local residents; if residents had the toads in their garden then they may have expected their neighbours did too. The restricted range of *A. obstetricans* in Cambridge may be directly linked to the urban gardens being enclosed rendering longer distance movement less unlikely since as well as walls and houses they are also surrounded by four relatively busy roads which must act as barriers to movement. Some dispersal has occurred since their initial introduction but only within a restricted area.

However, *A. obstetricans* could be heard calling from gardens close by, with up to a dozen males heard during one visit. Further study is needed as there were clearly more males present than we could identify. Due to their size, colouration and habits the toads were difficult to locate and success in being able to locate male toads is almost solely due to the Dragon Finder App from Froglife. Also lack of eye-shine and the way their call is reflected from surrounding surfaces such as walls and fences increases detection difficulties. Unfortunately the pre-recorded calls from the app were taken at an undisclosed location so we cannot infer how this regional call may affect our method for such a widely distributed species as *A. obstetricans*.

No visits were made in the spring since local residents reported not having heard the toads calling, despite a peak breeding activity between April and June (Beebee & Griffiths, 2000). It is unlikely that the toads bred earlier in the year and that their tadpoles have metamorphosed before our surveys. As the toads make a conspicuous call to attract mates to breed, the lack of calling would also indicate a lack of breeding. This also seems unlikely as metamorphs haven't been found during manual searches and males have been seen to be carrying eggs throughout both years of the study so far. None of the garden ponds have fish present which has made the absence of larvae even more puzzling.

Across the site visits that we made, male *A. obstetricans* were not seen to have been travelling any more than 20 m with the same individuals found in similar and not too distant locations on each visit. Individuals were identified using the dorsal photos taken during encounters and compared with one another. This is most likely due to the fact that the species has a low dispersal rate (Tobler et al., 2013).

*A. obstetricans* is clearly coexisting with native species and there is no evidence of negative effects on native amphibians, perhaps expected as they frequently occur sympatrically in continental Europe. The only potential threat is as a disease vector of the amphibian chytrid fungus (*Batrachochytrium dendrobatidis*) which is responsible for amphibian declines globally (Skerratt et al., 2007). *A. obstetricans* has a low tolerance to the fungus (Bosch et al., 2001) although it has been shown that *A. obstetricans* colonies can persist if there is low chytrid fungus prevalence (Tobler et al., 2012).

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