



## LONDON HOGWATCH

Barnes Common and Putney Lower  
Common camera trap survey,  
October 2018



**Wimbledon  
and Putney  
Commons**

Chris Carbone ([chris.carbone@ioz.ac.uk](mailto:chris.carbone@ioz.ac.uk))  
Rachel Cates ([rachel.cates@ioz.ac.uk](mailto:rachel.cates@ioz.ac.uk))

## Introduction

Hedgehogs in the UK have experienced a dramatic decline over the last 20 years, with estimates suggesting that numbers have fallen from 1.5 million in 1995 to under 1 million in 2015<sup>1</sup>. The causes of this decline are complicated, as many factors are likely to be interacting to produce this effect. These factors include habitat loss, use of pesticides and other agricultural chemicals, road traffic and possibly also the increasing badger population<sup>2,3</sup>. London Hogwatch is aiming to help halt hedgehog population decline in London by understanding the abundance and distributions of major hedgehog populations in the capital to better develop future management strategies. This work is being carried out alongside other nature conservation organisations and was co-funded by the Peoples Trust for Endangered Species.

A key problem with conservation efforts for London hedgehogs so far is a lack of knowledge about the occurrence, size and levels of connectivity of the populations. Having this information would allow for efforts to be targeted and therefore more successful. Currently, data is predominately gathered from citizen science surveys, such as the PTES Big Hedgehog Map (<https://bighedgehogmap.org/>). Whilst this method can provide useful data on hedgehog presence, little can be inferred about their absence. London Hogwatch uses a different approach, that of systematic camera trapping, to provide data on both presence and absence. In addition, the use of camera traps means data on other species that may impact hedgehogs is also collected, such as red foxes and badgers.

The project was initially focused on surveying parks in north London, with surveys conducted in Alexandra Park, Hampstead Heath, Highgate Wood and Queen's Wood. The focus has now moved south west, to Home park (Hampton Court Palace), Richmond park and Barnes/Putney Lower Commons. Barnes was of particular interest to the project due to reports of both badgers and hedgehogs. The local neighbourhood group, Barnes Hedgehogs, also regularly report hedgehogs in gardens close to the Common. Conducting a full survey would allow us to see if they had a presence beyond an occasional sighting on the Common itself.

## Survey Method

The survey took place over a period of three weeks, from the 1<sup>st</sup> to the 22<sup>nd</sup> October 2018. 30 Browning Strike Force Pro camera traps were placed across Barnes Common and a section of Putney Lower Common (Figure 1). 29 of these placements were successful, active for 603 trap days in total. The traps were set to trigger and take a photo every second if an animal entered the detection zone of the camera. Use of infrared flash allowed the cameras to be active at night as well as day. To ensure even coverage of the greenspace, cameras were placed as close as possible to a predetermined grid pattern. Volunteers from the Friends of Barnes Common assisted with camera set up and collection, after receiving training from the Hogwatch team.

Only photos taken between the hours of 6pm and 8am were processed, as the species of interest (hedgehogs, foxes and badgers) are predominantly nocturnal. This restricted tagging also has the benefit of avoiding much of the human activity the cameras detect. Once tagged, the data was used to calculate trapping rates (number of sightings/the days the camera was active) for each site and species of interest. Maps generated from this data are provided in the results section.

For parks where a high number of hedgehog sequences are recorded, the camera trap survey method facilitates the use of a statistical technique known as Random Encounter Modelling to estimate the population density of a species<sup>4</sup>. Unfortunately, in this case too few hedgehog sequences were captured to do this. However, we were able to provide estimates of distributions along with anecdotal records of hedgehog presence in the surrounding region.



Figure 1: Map showing camera sites, site coordinates are provided at the end of the report.

## Results

### Barnes and Putney Lower Common

Barnes had relatively high number of mammal species when compared to previous park surveys, although the overall trap rates are low, with the rate for hedgehogs in Barnes being about half that found in Regent’s Park. The results included sequences from the target species, hedgehogs, as well as badgers, foxes, cats, mice, rats and squirrels (Table 1). Humans and dogs were also detected by the cameras.

Table 1: Summary of survey results. Overall trapping rate is the number of contact events divided by the total number of camera trap nights.

Species	Number of Sightings (6pm-8am)	Number of Sites Present	Overall Trapping Rate
Hedgehog	19	7	0.032
Fox	499	26	0.823
Badger	12	3	0.02
Cat	48	11	0.08
Mouse	36	7	0.06
Rat	3	2	0.005
Squirrel	75	19	0.124

Hedgehogs were seen at six camera sites, with 19 sequences in total (Figure 3). Hedgehog presence is indicated by a red circle and absence with a white circle. Larger red circles indicate a higher trapping rate (although the actual difference in rates between sites was small).



*Figure 3: Map showing the sites where the camera captured **Hedgehog** sequences. Red indicates presence and white absence. Trapping rates (the total number of hedgehog sequences taken by the camera/ number of days the camera was active) ranged from 0 to 0.19. Larger circles indicate higher trapping rates.*

Badgers were seen at three camera sites, with 12 sequences in total (Figure 4). Again, circle colour indicates presence/absence and circle size the trapping rate. A badger sett has been found on the Common (the red square on Figure 4). As would be expected, the sett is close to sites that recorded badger activity.



Figure 4: Map showing the sites where the camera captured **Badger** sequences. Blue indicates presence and white absence. Trapping rates ranged from 0 to 0.38. Badger sett is located at the red square.

Foxes were the most common species to be detected by the cameras, with 499 sequences over 26 sites (Figure 5). The size of the circle indicates trapping rate, however, as the scaling in this map is different to that of the hedgehog and badger, the map symbols are not comparable between species.



*Figure 5: Map showing the sites where the camera captured **Fox** sequences. Yellow indicates presence and white absence. Larger circles indicate higher trapping rates (though not directly comparable to the previous species maps). Rates ranged from 0-4.29.*

### Garden Cameras

As an extension of the Barnes Common survey, camera traps were also placed in residential gardens in the area around the Common (Figure 6). Six cameras were placed in total, with all cameras detecting a hedgehog. It appears that there is a well-established population of hedgehogs at a high density in the area between Elm Grove Road and Rocks Lane. These hedgehogs are well supported by the residents, with the provision of food, water and nest boxes in many gardens.

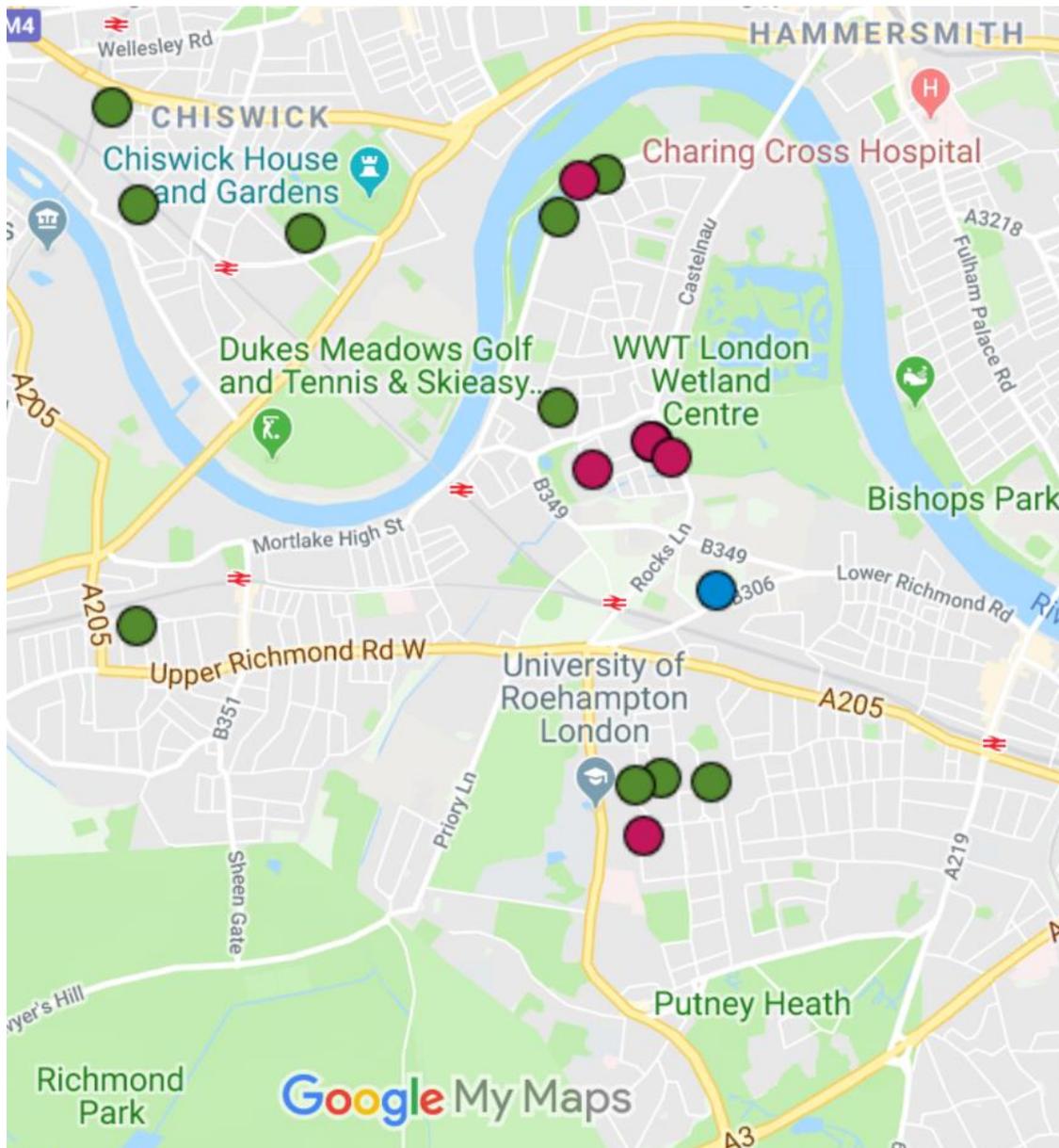


Figure 6: Map of the region surrounding Barnes Common (blue), showing locations of garden cameras (pink) and hedgehog sightings (green) reported to the PTES Big Hedgehog Map 2017-18. Two cameras were placed on Elm Grove Road.

## Discussion

This survey has provided confirmation that there are both hedgehogs and badgers present on the Common and given an indication of habitat use by these species.

The exact nature of the ecological interaction between hedgehogs and badgers is still up for debate. Badgers may have a negative effect on hedgehog populations through predation or intraguild competition<sup>5</sup>, which could put pressure on this hedgehog population. Survey results indicate that this competition may be occurring, as the two species were not found on the same side of the Common. Hedgehogs may be avoiding areas commonly used by badgers, behaviour seen in other studies<sup>6</sup>. Dead hedgehogs with characteristic signs of badger predation (skins with only the spikes remaining) have

been found on two occasions within the last few months. However, no definite conclusion about the impact of the badgers on the Common hedgehogs can be made at this point, as there is no baseline data prior to this study. Further surveys of the situation across several years would be needed to investigate their relationship further.

It is thought that the movement of badgers onto the Common is a relatively recent occurrence. The nearby Richmond Park has a large population of badgers, and several greenspaces (Roehampton golf club and Palewell Common) may have formed a green corridor that facilitated badger dispersal to Barnes. Alternatively, railways have also been known to aid mammal dispersal in urban areas. Finding an active sett on the Common fits with an observed trend of this species moving into increasingly urban areas of the UK<sup>7</sup> If badgers did colonise the Common relatively recently, the situation will still be dynamic and could change.

The hedgehog population on the Common is likely to be small, as only 19 sequences were recorded by the cameras. This does mean that it could be at risk, either from badgers, as discussed, or from other threats. Anecdotal reports suggest that droughts and heatwaves such as the one experienced in the UK this year have a detrimental impact on hedgehog survival and breeding, as their prey (slugs, earthworms etc) become scarcer. It is possible hedgehog numbers on the Common may have been higher if the survey had been conducted during July-August period. Despite its small size, the Barnes hedgehog population appears to be in a relatively positive position, as it is unlikely to be completely isolated (unlike the population in Regents Park for example). They do occur in the wider area (figure 6), in nearby gardens and in the WWT London Wetland Centre.

The camera traps placed in gardens recorded a very high number of hedgehog encounters, with hedgehogs visiting garden food stations (provided by homeowners) most nights. If hedgehogs from the gardens can disperse to the Common, these animals could be important in supporting the small number of hedgehogs on the Common, increasing the likelihood the population can persist in the future. Monitoring of individual hedgehogs would be required to confirm this movement. The creation of a 'Hedgehog Highway' in residential areas of Barnes is working towards improving this connectivity. However, it may be that as the garden hedgehogs are well provided for in terms of food and shelter, they have a reduced need to disperse and do not mix with the Common hedgehogs.

The roads around the common are a threat to both hedgehogs and badgers, with reports of both species being found dead. Two badgers were killed recently, how active the sett remains is unknown. Cameras placed by the sett after the survey ended should provide some indication.

## Conclusion

We suggest that another camera trap survey takes place in 2019, to observe whether any changes in the species distributions have occurred, as Barnes is an important case study for investigating urban hedgehog/badger coexistence. Repeating the survey would also indicate if the hedgehog population on the Common is stable, decreasing or increasing.

## References

1. Pettett, C. E., Johnson, P. J., Moorhouse, T. P. & Macdonald, D. W. National predictors of hedgehog *Erinaceus europaeus* distribution and decline in Britain. *Mamm. Rev.* **48**, 1–6 (2018).
2. Williams, B. M. *et al.* Reduced occupancy of hedgehogs (*Erinaceus europaeus*) in rural England and Wales: The influence of habitat and an asymmetric intra-guild predator. *Sci. Rep.* **8**, 12156 (2018).
3. Wilson, E. & Wembridge, D. The State of Britain's Hedgehogs 2018. Available at: <https://www.britishhedgehogs.org.uk/pdf/sobh-2018.pdf>. (Accessed: 16th March 2018)
4. Rowcliffe, J. M., Field, J., Turvey, S. T. & Carbone, C. Estimating animal density using camera traps without the need for individual recognition. *J. Appl. Ecol.* **45**, 1228–1236 (2008).
5. Trewby, I. D. *et al.* Impacts of Removing Badgers on Localised Counts of Hedgehogs. *PLoS One* **9**, e95477 (2014).
6. Young, R. P. *et al.* Abundance of hedgehogs (*Erinaceus europaeus*) in relation to the density and distribution of badgers (*Meles meles*). *J. Zool.* **269**, 349–356 (2006).
7. Gehrt, S. D., Riley, S. P. D. & Cypher, B. L. *Urban carnivores : ecology, conflict, and conservation*. (Johns Hopkins University Press, 2010).

Table 2: Coordinates for the camera sites on Barnes/ Putney Lower Common.

Camera Site	Latitude	Longitude		Latitude	Longitude
<b>1</b>	51.46564	-0.24748	<b>16</b>	51.46856	-0.23115
<b>2</b>	51.46564	-0.24514	<b>17</b>	51.46856	-0.22882
<b>3</b>	51.46564	-0.24281	<b>18</b>	51.47002	-0.24281
<b>4</b>	51.4671	-0.24514	<b>19</b>	51.46997	-0.24108
<b>5</b>	51.46731	-0.24277	<b>20</b>	51.47002	-0.23815
<b>6</b>	51.4671	-0.24048	<b>21</b>	51.47002	-0.23582
<b>7</b>	51.4671	-0.23815	<b>22</b>	51.47002	-0.23349
<b>8</b>	51.4671	-0.23582	<b>23</b>	51.47002	-0.23115
<b>9</b>	51.4671	-0.23115	<b>24</b>	51.47002	-0.22882
<b>10</b>	51.46751	-0.22891	<b>25</b>	51.47149	-0.24281
<b>11</b>	51.46856	-0.24281	<b>26</b>	51.47149	-0.24048
<b>12</b>	51.46856	-0.24048	<b>27</b>	51.47149	-0.23815
<b>13</b>	51.46856	-0.23815	<b>28</b>	51.47149	-0.23349
<b>14</b>	51.46856	-0.23582	<b>29</b>	51.47149	-0.23115
<b>15</b>	51.46856	-0.23349	<b>30</b>	51.47149	-0.22882