



Hedgehog Improvement Areas

Final Report 2015-2019



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Dr Deborah Wright

Warwickshire Wildlife Trust (WWT) started a *Help for Hedgehogs Campaign* in 2013 in response to dropping national hedgehog numbers. This campaign aimed to raise awareness and get people interested in helping their local hedgehogs. Owing to high levels of interest, in 2015, the UK's first *Hedgehog Improvement Areas (HIA)* was set up across the largely urban borough of Solihull. Following its success, a sister HIA was then launched in the largely rural borough of Rugby in April 2016. Both HIAs were majority funded by the *British Hedgehog Preservation Society (BHPS)* and ran until the end of 2019.

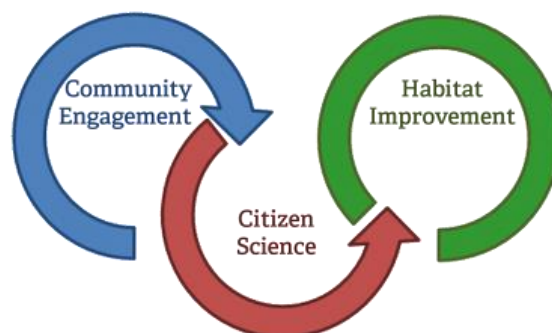


Figure 1. The premise of the HIA project. Copyright WWT.

The vision of the HIAs was to empower communities to save their local hedgehogs, with dedicated hedgehog officers providing focused community engagement, and encouraging surveying and habitat improvements.

The following final report summarises the outcomes of 5 years of work across the Solihull and Rugby HIAs. Activity is broken down into distinct areas of work throughout the report.

1. Community Engagement

1.1. Events

The hedgehog team engaged with almost 15,000 people face-to-face across the HIAs throughout the duration of the project. Audiences reached were diverse and wide-ranging, from families, to older adult groups, to nursery children, to school children and college students across both urban and rural areas. Events included talks, guided walks, training, networking, crafts, practical activities and habitat workshops.

	2015	2016	2017	2018	2019
Solihull	3397	1967	1599	1125	571
Rugby		2295	2670	859	225
Totals	3397	4262	4269	1984	796
	14708				

Table 1. Numbers of people engaged across the HIAs annually.

Feedback from the events suggests that people enjoyed the activities, learnt from them and felt inspired to take action. Example comments include:

"Thank you for a fab day... I had a great time and know that the Brownies did too... We spent last Monday night designing hedgehog friendly gardens, using lots of info and resources we acquired from you."



Figure 2. Community engagement events across the HIAs. Copyright WWT (1), Karen Armbrister (2), Louise Barrack (3), Hugh Warwick (4), TCV (5), Henry Johnson (6), Castle Bromwich Hall Gardens (7) and Emma Richmond & Steven Cheshire (8).

"We have had some great feedback and all our members really enjoyed the evening which was both informative and entertaining."

"So much information - extremely useful, now more knowledgeable about [how] to try and encourage a hedgehog in our garden."

"...I hope we have all taken away a lot more that we can do to help the dwindling hedgehog population. I know they all enjoyed it very much."

The numbers engaged reflects a general pattern of the project becoming more focused and legacy based over time. Initial efforts in Solihull in 2015, and in Rugby in 2016-17, involved broad engagement across large areas to high numbers of people, raising awareness and publicising the project far and wide. In this phase of the project, people were taking notice of the plight of the hedgehog and beginning to take part in activities. However, as the project progressed, there was more of an emphasis on encouraging people to take action to help their local hedgehogs. To this end, more practical habitat improvements took place. Engagement also took place in more focal areas.

1.2. Education

Primary schools across the HIAs were offered free educational lessons about hedgehogs that linked with the National Curriculum. These lessons were tailored to the schools, and often included a large school assembly followed by smaller break-out groups with activities and practical surveying of the school grounds by footprint tunnel. Forest school and gardening groups were engaged, as well as SEN groups. Engaging with the future generations of conservationists was considered a primary goal of the HIAs, and children were provided with information to take home to their parents, to further encourage action to help hedgehogs at home.

In 2017, a short survey was developed for school pupils relating to hedgehog biology, ecology and conservation, comprising questions that were asked before and after learning interventions. Results from 15 school visits suggested an average increase in understanding of approximately 20%, following high levels of approximately 60% baseline knowledge.

	2015	2016	2017	2018	2019
Solihull	2289	1238	852	349	358
Rugby		1500	1871	148	0
<i>Totals</i>	2289	2738	2723	497	358
	8605				

Table 2. Numbers of school children and students engaged across the HIAs annually.

Once again, the numbers engaged reflects a general pattern of the project becoming more focused over time. Educational packs for schools were designed in 2019 to create a legacy of the educational work that is now available to download for free. These packs include lesson plans, games and activities for Key Stages 1 and 2. There was more of an emphasis on providing targeted higher level education to work experience, college and university students in the later years of the project.

1.3. Community Groups

Community groups were engaged with throughout the project. Varied groups e.g. scouts and guides, gardening clubs, wildlife action groups, parish councils, faith groups, residents

associations and teachers groups, were given talks to raise awareness about hedgehog decline and to encourage members to make habitat changes in their gardens and local areas. As the project continued, groups were engaged at a higher level to survey for hedgehogs and to make physical habitat improvements on greenspace. For example, the *Elmdon Park Supporters Group*, *Earlswood Wildlife Partnership*, *Rugby Wildlife Group* and *Friends of East Rugby (FERG)*, *Cawston Greenway* and *Bluebell Walk* groups surveyed their local greenspaces, as well as work parties at local nature reserves, such as Cock Robin Wood and Newbold Quarry. FERG were particularly interested, and alongside *Rugby Borough Council (RBC)* and a local rotary club, were engaged in planting and maintaining a hedge. There was also partnership work with the *Coventry Diocesan Environment Group* to raise awareness of hedgehog conservation with church groups and encourage habitat improvement works. Messy church, cherishing churchyards and hedgehog house building events were held with churches in the Rugby HIA.

1.4. Volunteers

Volunteers were involved in the project since the beginning, largely helping to survey for hedgehogs, input data and improve habitat. In 2018, an official *Warwickshire Hedgehog Helpers (WHH)* group was formed, comprising 35 core volunteers. Over the course of two years, volunteers were given training opportunities in community engagement, surveying and practical habitat management, as well as the chance to use these newly developed skills at a range of events.



Figure 3. Volunteers getting involved in the HIAs. Copyright RBC (top right) and all others WWT.

The volunteer effort over the course of the project was phenomenal, with volunteers giving over 1500 hours of their time overall. Volunteers demonstrated considerable commitment, returning season after season despite some periods of bad weather and long nocturnal hours. Feedback from volunteers showed that they enjoyed being part of the project:

- “... the support and knowledge of the team is great and they really have supported us.”
- “[We] enjoyed last night very much, even with the rain! Looking forward to next week.”
- “...it was a great weekend, lovely participants, great leaders and expert tuition”
- “...Really enjoyed being part of the project and also learning a lot more about hedgehogs.”

	2015	2016	2017	2018	2019	Totals
Community engagement	0	3	0	51.5	14	68.5
Volunteer training and celebration	126	80	24	54	41	325
Footprint tunnel surveying	27	42	66	90	51	276
Torchlight surveying	0	41.5	119.5	106	210	477
Practical habitat works	30	35	176	154.5	119	514.5
Data management	10	20	25	50	25	130
	1791					

Table 3. Number of hours given by volunteers throughout the project.

These volunteers can now continue raising awareness and engaging people in hedgehog conservation as part of the legacy of the project, with the group becoming a subsidiary of the *Warwickshire Mammal Group (WMG)* in 2020 following the project end.

1.5. Dissemination

High levels of media coverage were received throughout the HIA project, including television, radio and newspaper coverage, which raised wide-scale awareness. This included international e.g. the *Wall Street Journal*, national e.g. *BBC Countryfile*, *BBC Radio 2*, the *Guardian*, and local coverage e.g. *BBC Midlands Today*, *BBC Coventry and Warwickshire*, the *Rugby Advertiser*. Articles were also included in magazines targeted at local communities, such as the *Hampton-in-Arden Society*, *Earlswood*, *Ettington* and *Arden Farm Wildlife Network* newsletters.



Figure 4. Infographic showcasing some of the media coverage the HIA project received.

The www.helpforhedgehogs.co.uk website ran throughout the project and was redesigned in January 2018, with rebranding and commissioned artwork by Ceri Thomas to appeal to both adults and children. The website was transitioned at the end of 2019 to a series of linked pages on the main WWT website, with a wide range of resources uploaded, including specifically designed factsheets, worksheets, project reports, videos and links to other useful organisations. This area

now acts as a legacy platform, where people can find information and download a range of resources to enable them to set up their own self-sustaining hedgehog projects.



Figure 5. The redesigned www.helpforhedgehogs.co.uk website.

The HIAs were also promoted and audiences engaged through social media, with over 1100 followers on the Help for Hedgehogs Facebook page and 3,500 on the Twitter page by the end of 2019. The #adventhog campaign was particularly popular, with animated hedgehog facts and jokes posted each day in December on the build up to Christmas. The number of Twitter impressions grew from 9,300 in December 2015 before the #adventhog campaign, all the way up to 153,000 impressions in December 2018. Each year, new followers were recruited, up to 61 in December 2018, who then largely appeared to be retained after the campaign ended each year.



Figure 6. Example illustrations from #adventhog. Copyright Deborah Wright (left), Tara Higgs (middle) and Fabia Kerr (right).

Findings from the project were disseminated throughout, for example at expert and biological recorder meetings and conferences. There was a particular emphasis on sharing knowledge and learning towards the end of the project and a specific learning document was produced. Advice was given regularly to those wanting to set up new hedgehog projects across the country. Support was given to, initiatives promoted for, and partnership work developed e.g. the *Hedgehog Housing Census* with existing projects, such as *HedgeOx* and *Hedgehog Street*.

2. Surveying

2.1. Sightings

Hedgehog sightings, dead and alive, were collected in person, by telephone, by email and through the WWT and *Help for Hedgehogs* websites and were shared with the Warwickshire Biological Records Centre (WBRC). Since the HIAs began in 2015, there were 2409 verified hedgehog sightings recorded across Warwickshire. Before the HIAs, there were only 750 recorded sightings, most of which were collected during the early years of the *Help for Hedgehogs Campaign*. This large increase in reported sightings indicates a raised awareness throughout the county since the start of the HIAs. Indeed, 21 new tetrads in Solihull and 26 in Rugby had hedgehogs reported since the start of the HIA project.

	2015	2016	2017	2018	2019
Solihull	65 (12%)	75 (10%)	38 (7%)	46 (11%)	18 (9%)
Rugby		400 (54%)	258 (49%)	217 (55%)	124 (61%)

Table 4. Number of hedgehog sightings recorded across the HIAs, with the percentage of the total vice county sightings for that year in brackets.

Despite the Solihull HIA running for longer, only 242 of the sightings since the HIAs began came from Solihull and 1235 from Rugby. Although records were highest across the HIAs in the early years of the project, correlating with widespread engagement in these boroughs, the very different numbers of records from each HIA suggests that it is not simply high levels of engagement leading to the records. Indeed, Rugby sightings account for a disproportionate 51% of vice county sightings overall, ranging from 49% to 61% annually throughout the project, despite engagement levels significantly decreasing in later years. Although incidental sightings reports only indicate presence and not absence, and do not provide information on frequency, this recurring pattern may potentially indicate high numbers of hedgehogs in Rugby, or at least potential 'hotspots' and 'blackspots' of activity.

As reporting is reliant upon the public, distribution can often directly correlate with residential, urbanised centres. However, there is a noticeable lack of sightings in some urban centres where habitat is largely unsuitable for hedgehogs, with large areas of grey infrastructure, main roads fragmenting the landscape, and rows of terraced houses with brick walls impeding access into, and movement across, gardens. Some clustering of sightings can be seen in outlying villages that may act as 'refuges' from rural areas facing steep declines, where there are large gardens and areas of suitable habitat connected through the landscape. Clusters can also be seen from roadkill reports, often along rural tracts where speed limits are high and lighting is limited for motorists, thought to be an important factor in rural hedgehog decline. Across the years, the sightings seem to have become further concentrated within urban areas, perhaps reflecting the national trend of hedgehogs being more heavily in decline in rural areas and faring better in urban 'refuges' (see the *State of Britain's Hedgehogs 2018* report).

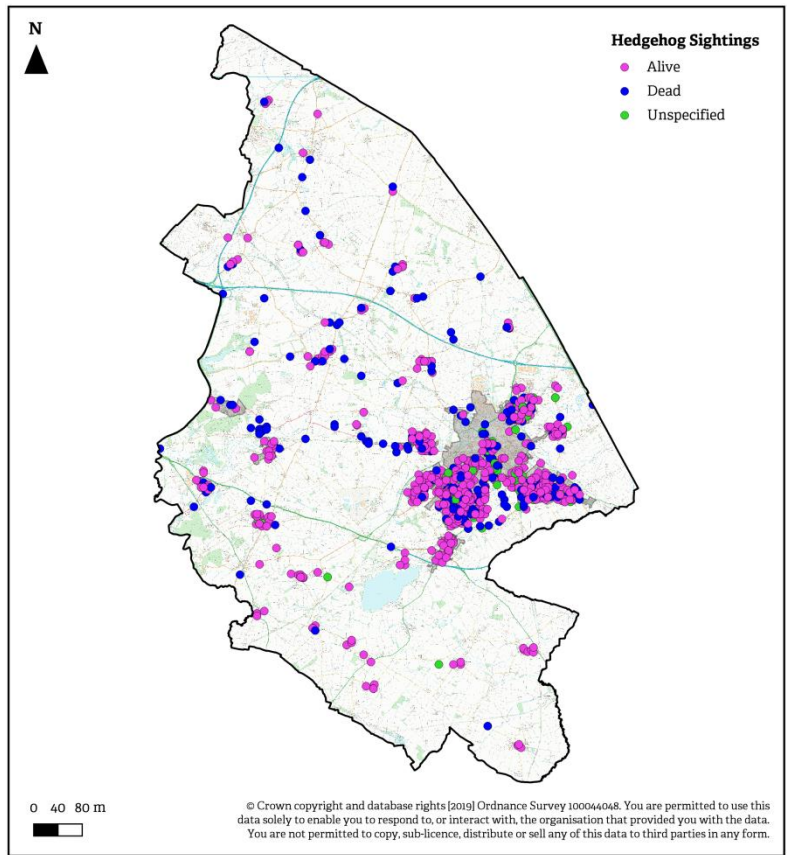
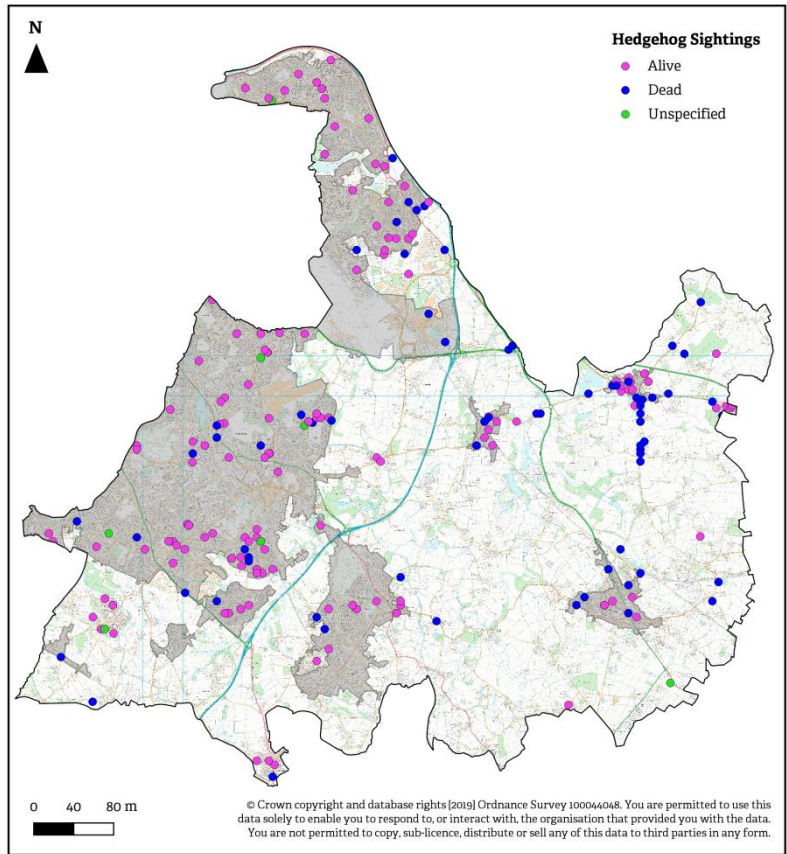


Figure 7. Distribution of dead and live hedgehog sightings within Solihull metropolitan borough (top) and Rugby borough (bottom) from 2015 to 2019, with urban areas shown in grey.

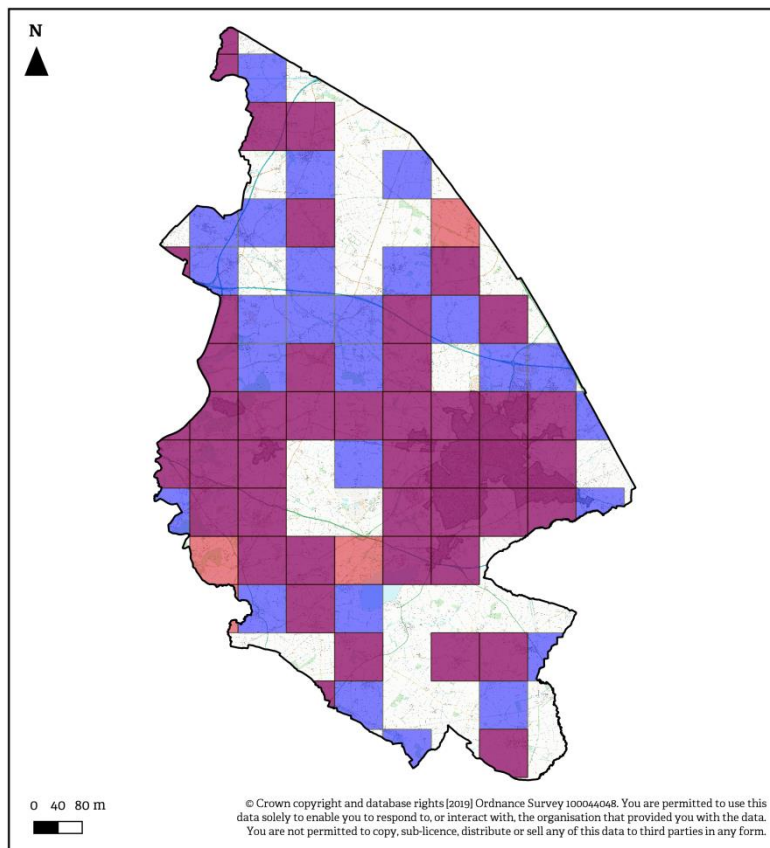
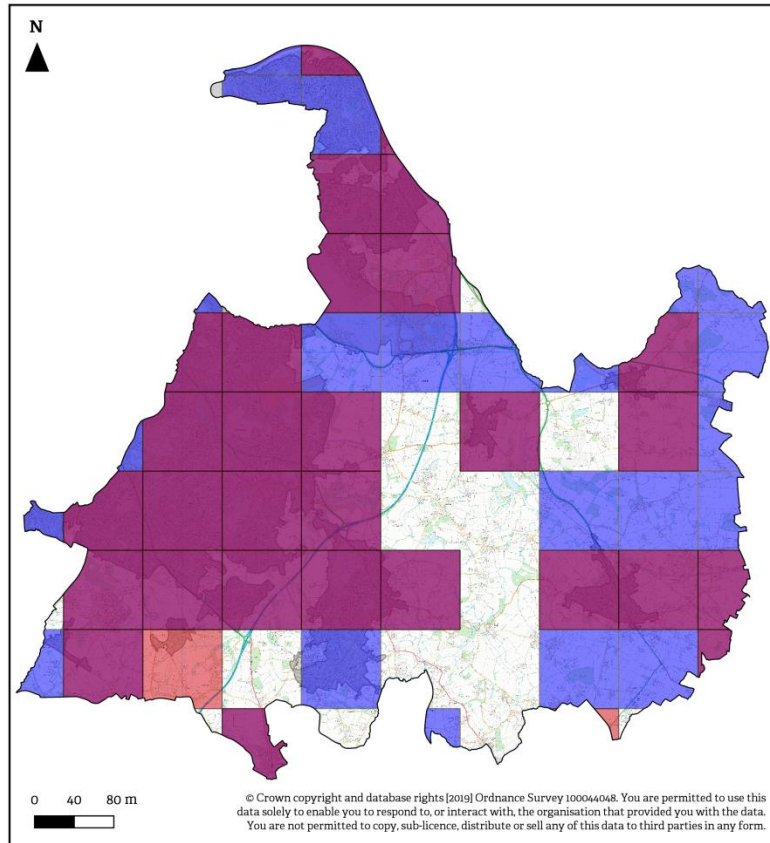


Figure 8. Hedgehog sightings in 2x2km tetrads within Solihull metropolitan borough (top) and Rugby borough (bottom), with colours indicating when sightings were collected: pink (before HIAs), blue (during HIAs) and purple (both before and during HIAs).

2.2. Footprint Tunnel Surveys

Footprint tunnels were used throughout the study as a way of surveying for hedgehogs. They were lent to the general public across the HIAs to survey their gardens and they were used by volunteers to survey focal areas of greenspace. The tunnels are a simple method used to detect the presence or absence of hedgehogs in an area. A triangular Correx™ tube is baited with Spike's Dinner Dry Hedgehog Food™ and placed along the edge of a green space, where hedgehogs roam. The target animal is attracted to the bait and as it approaches to eat the food, it walks over a carbon-based ink mixture and adjacent white paper, leaving footprint tracks. Tunnels can be set and checked quickly and easily during the day. It has been found that a 5 day survey with 10 tunnels in a 1km² area yields a 95% confidence of hedgehog presence or absence (Yarnell et al., 2014).



Figure 9. Senior Hedgehog Officer Deborah Wright checking and re-setting a footprint tunnel in a park (left) and hedgehog footprints obtained during a footprint tunnel survey (right). Copyright Deborah Wright.

Hedgehogs were found to be present in greenspaces that were often relatively urbanised, surrounded by roads and nearby residential gardens, and sometimes allotments. Interestingly, well-connected sites with seemingly 'good' habitat often did not indicate hedgehog presence. This appears to reflect a national pattern of hedgehogs preferring garden habitat and being found more and more in urbanised spaces.

Footprints tunnels proved popular and engaging with families, yet often yielded low results. For example, during the first year of the Solihull HIA, 177 locations were surveyed but only 16% indicated hedgehog presence. In gardens, the method can be problematic because owing to barriers between houses such as impermeable fences and walls, the surveying often only provides data on single gardens, with hedgehogs being unable to access the tunnels even when they are nearby. However, under one third of public greenspaces surveyed each year also indicated hedgehog presence, and these sites were generally accessible to hedgehogs. High levels of disturbance by people and animals were often reported, which interrupted surveys. The sites were also often heavily dog walked, which may have impacted hedgehog presence. The method also only captures a 'snapshot' in time: hedgehogs may be using the space at other times of year and the method is difficult when considering that 20% of hedgehogs are thought to be nomadic.

Indeed, footprint tunnels in Regent's Park, London, have indicated absence, even when hedgehogs are known to be present. Multiple survey methods were therefore used in important focal areas, for results to be corroborated.

SMBC Greenspace	Hedgehog Presence			
	2015	2016	2017	2018
Babbs Mill Park	✓	✓	✓	✓
Cole Bank Park	✓	✓	✓	N/A
Dorridge Park	x	x	x	x
Elmdon Heath	x	x	x	x
Elmdon Coppice	✓	✓	x	x
Elmdon Park	x	x	x	x
Hillfield Park	x	x	x	x
Knowle Park	x	x	x	x
Lanchester Park	x	x	x	x
Langley Hall Park	N/A	x	✓	x
Malvern and Brueton Park	✓	✓	✓	x
Meriden Park	x	x	✓	✓
Olton Jubilee Park	N/A	x	x	x
Shirley Park	x	x	x	x
Tudor Grange Park	x	x	x	x
Wychwood	N/A	x	x	x

Table 5. Hedgehog presence in Solihull Metropolitan Borough Council (SMBC) managed greenspaces, established using footprint tunnel surveys from 2015-2018.

RBC Greenspace	Hedgehog Presence			
	2016	2017	2018	2019
Ashlawn Cutting	x	x	x	x
Dewar Grove	✓	x	x	x
Linnell Road LNR	N/A	x	x	x
Whinfield Cemetery extension	x	x	x	x
Burnside	x	✓	x	x
Rokeby Open Space	✓	x	✓	x
Centenary Park	N/A	x	x	x
Newbold Paddock	N/A	x	x	x
Boughton Road	N/A	x	x	x
Pantolf Place	N/A	✓	✓	x
Avon Mill Recreation Ground	N/A	x	x	x
Yates Avenue	N/A	x	x	x
Bilton Pavilions	N/A	x	✓	✓
Addison Road Recreation Ground	N/A	x	x	✓
Cornwallis Road Open Space	N/A	✓	x	x
Shakespeare Gardens	N/A	N/A	x	x
Apple Grove	x	N/A	x	x
Hillmorton Recreation Ground	N/A	x	x	x

Table 6. Hedgehog presence in RBC managed green spaces, established using footprint tunnel surveys from 2016-2019.

2.3. Torchlight Surveys

Night-time surveys for hedgehogs were carried out across both HIAs from 2016 onwards, following Poulton & Reeve's (2010) methodology. Initially, multiple sites were surveyed for one or two nights during the summer season, from when it became dark to midnight or slightly later. Transects were walked as a small group, illuminating open and marginal areas using powerful handheld torches and 1 million candle power Cluson Clubman lamps. When hedgehogs were found, they were mapped. Focal areas of greenspace were chosen, often to confirm presence/absence from footprint tunnel surveys.

However, there were various problems with this approach. Only two hedgehogs were seen over several years. It became apparent from other nationwide survey efforts that surveys needed to be all night long to maximise the chances of finding hedgehogs. Some of the greenspaces chosen appeared to have either no, or minimal numbers of hedgehogs using the sites and where hedgehogs were present, it would likely take more nights of surveying at those sites to provide an accurate estimate of numbers. It was also difficult to gain an understanding of numbers because hedgehogs were not marked, and surveyors could not be certain that they were not simply recounting one hedgehog multiple times.

The decision was made in 2018 to conduct all night surveys from 11pm to 4pm for 3-4 nights each at two focal "hedgehog hub" sites in the HIAs. These sites had been working in partnership throughout the project, with staff and volunteers involved in hedgehog surveying and events. Focal parts of the sites where hedgehogs were most frequently encountered were chosen for torchlight survey transects. In Solihull, this formed a 197,079 m² area comprising Castle Bromwich Hall Gardens (formal gardens, several ponds, an orchard and some scrubby areas) as well as an adjacent area of mixed scrub, grassland and woodland owned by *Birmingham City Council (BCC)*. In Rugby, a focal area of 281,701 m² in Coombe Country Park was selected, comprising a formal driveway lined with veteran trees, scrubby car park areas, amenity grassland, formal gardens, woodland and a formal hedgerow.

A licence was obtained from Natural England to mark any hedgehogs found and additional funds from the *D'Oyly Carte Charitable Trust* and *Naturesave* allowed for new equipment to be bought (including brighter MT14 Led Lenser torches and Seek Thermal RevealXR FastFrame cameras). When hedgehogs were encountered, they were given a health check, measured, weighed, sexed and marked using numbered heat shrink plastic tubes, before being released back to where they were found. The tubes were initially soldered on but then glued over 5 spines on the crown of the head as this seemed to be more long-lasting. As hedgehog spines are made of a keratin protein similar to human hair, this will not have hurt the hedgehogs.

The results of the torchlight surveys can be seen across Figures 10-13, which show where individual hedgehogs were found and other fauna seen during the surveys. Table 7 also details the data captured for individual hedgehogs.



Figure 10. Torchlight survey results for Castle Bromwich in September 2018 (top), May 2019 (middle) and September 2019 (bottom). Hedgehogs are only shown when encountered for the first time that month. Copyright WWT.

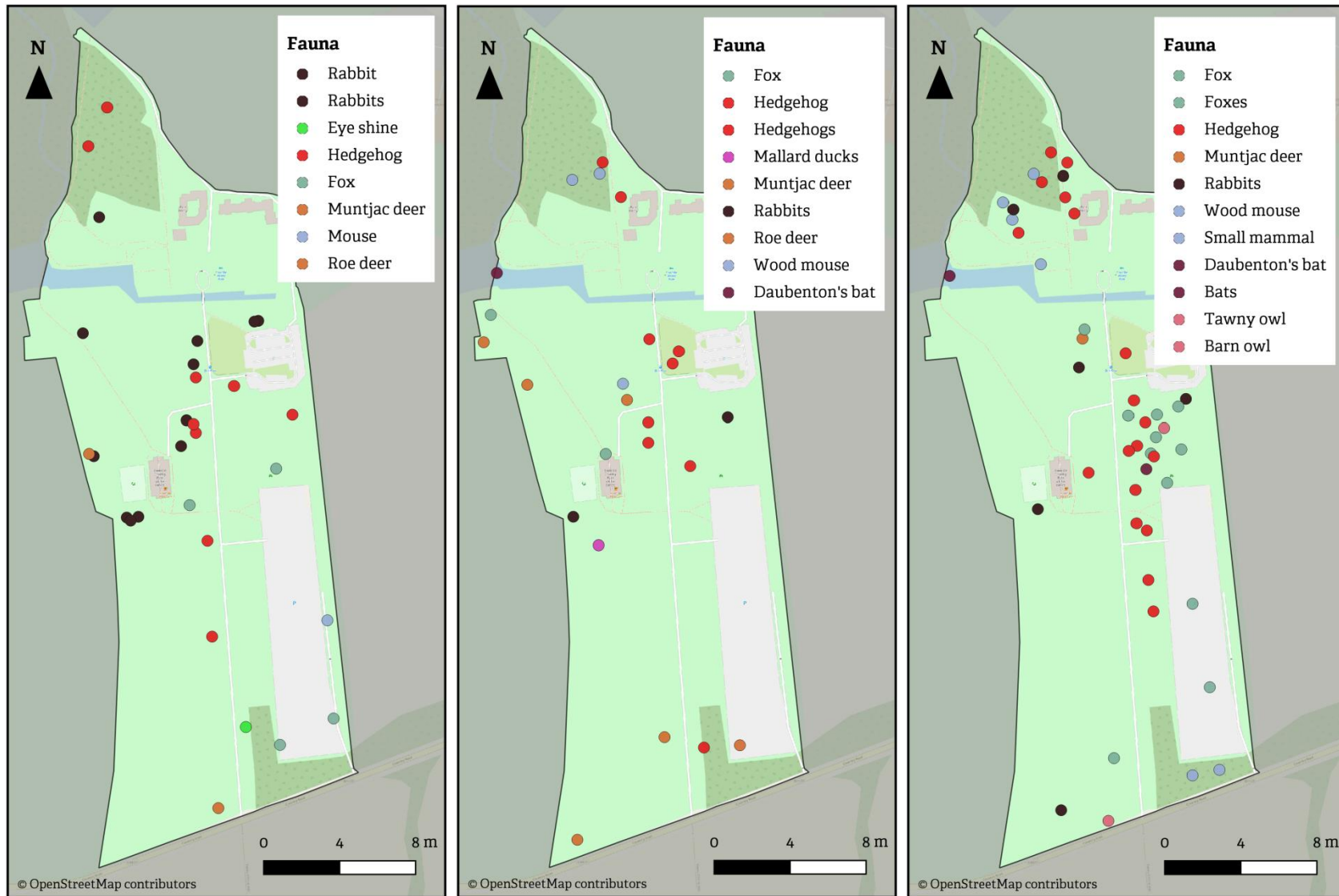


Figure 11. Torchlight survey results for Coombe Country Park in September 2018 (left), May 2019 (middle) and September 2019 (right). Hedgehogs are only shown when encountered for the first time that month. Copyright WWT.

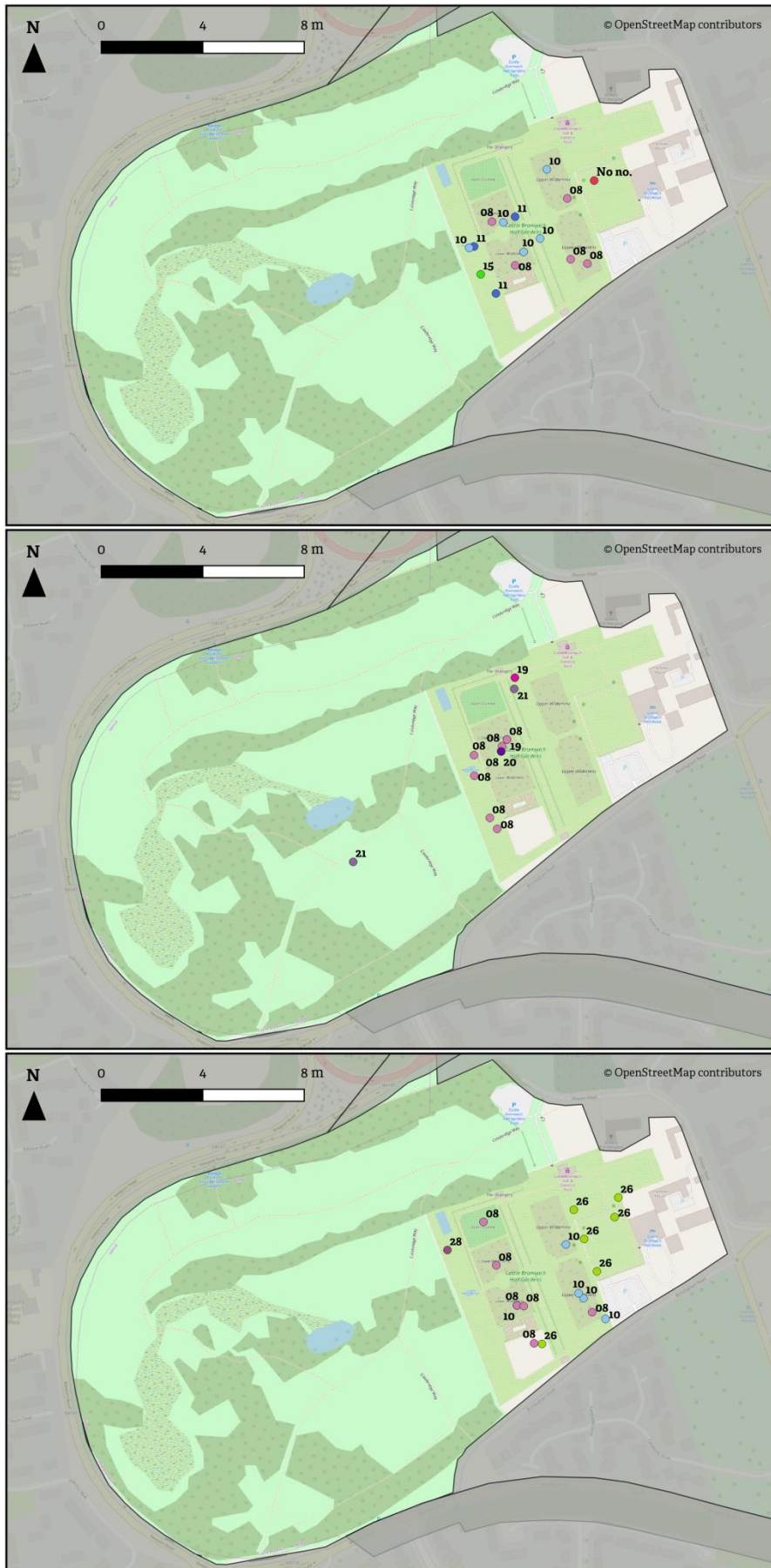


Figure 12. Individual hedgehogs seen during torchlight surveys of Castle Bromwich in September 2018 (top), May 2019 (middle) and September 2019 (bottom). Copyright WWT.

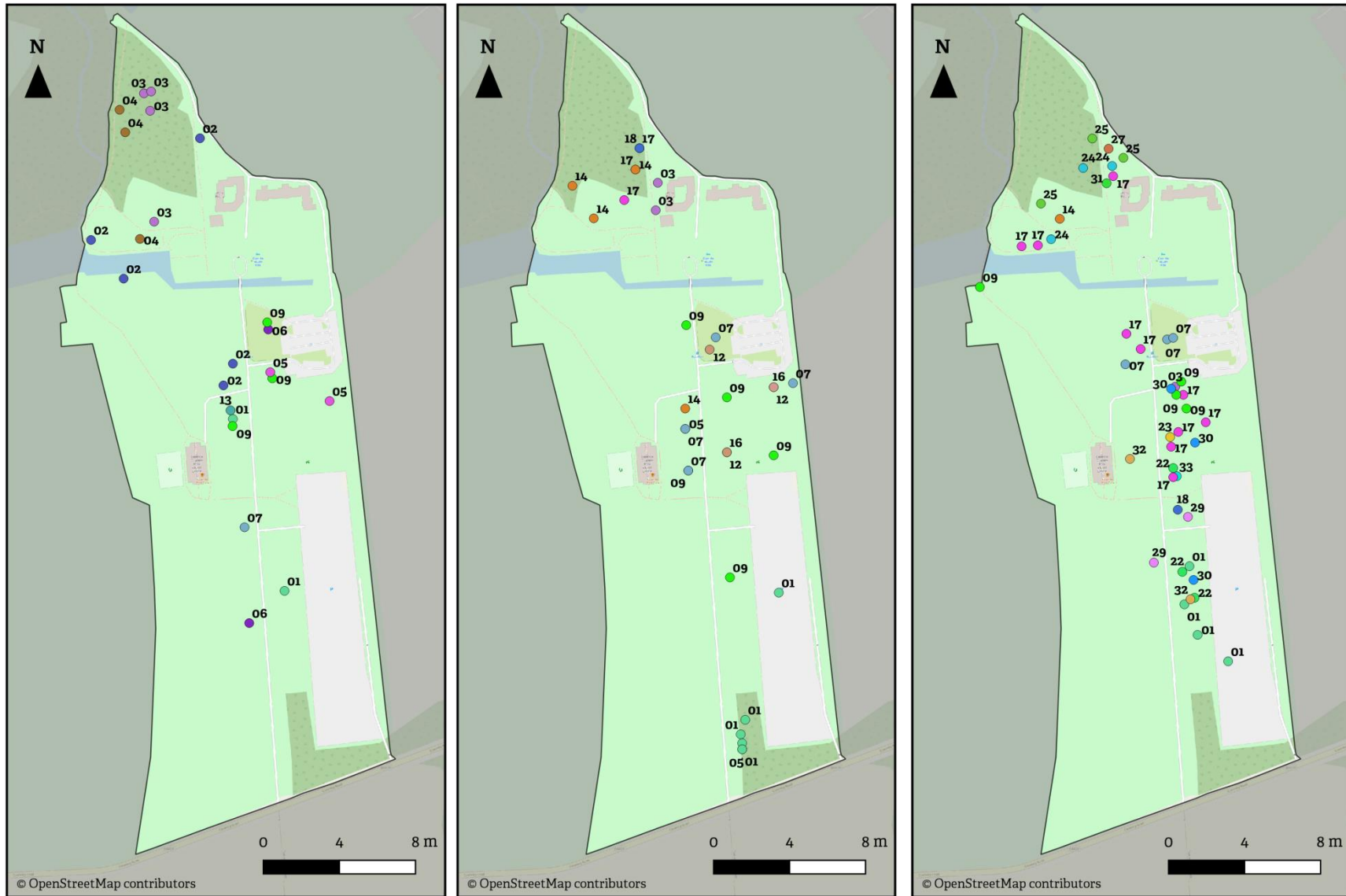


Figure 13. Individual hedgehogs seen during torchlight surveys of Coombe Country Park in September 2018 (left), May 2019 (middle) and September 2019 (right). Copyright WWT.

No.		Date	Time	Distance seen (m)	Circumference (cm)	Weight (g)	Age	Sex	Habitat	Behaviour
Castle Bromwich										
8	Tagged	13/09/18	22:54	2	50	723	Adult	Female	PSM	ST
	Capture #1	18/09/18	23:23	6		764			PSM; RP	ST
	Capture #2	28/09/18	22:25	10		808			PSM	ST
	Capture #3	05/05/19	23:20	15	48	671			GRS	ST
	Capture #4	08/05/19	00:20	3		655			GRT/PSM	CH
	Capture #5	09/05/19	23:40	4		710			PSM	CH
	Capture #6	13/05/19	23:27	5		789			GRS	FO
	Capture #7	10/09/19	00:56	15	51	777			BS; PSM	FO
	Capture #8	11/09/19	00:05	8		750			GRS; PSM	FO
	Capture #9	12/09/19	23:55	4		758			GRS	ST
10	Tagged	18/09/18	21:39	8	52	781	Adult	Male	PSM	FO
	Capture #1	28/09/18	22:00	5		803			PSM	ST
	Capture #2	07/09/19	23:50	3	51	702			GRS	ST
	Capture #3	10/09/19	00:15	7		700			PSM	FO
	Capture #4	11/09/19	00:35	10		716			BS; PSM	ST
	Capture #5	13/09/19	03:15	4		733			PSM	SL
11	Tagged	18/09/2018	22:20	6	52	853	Adult	Male	GRS	FO
	Capture #1	28/09/2018	22:50	5		830			GRS	ST
	Released	18/10/2018			54	1199				
15	Tagged	28/09/2018	23:41	6	46	754	Adult	Female	OR	ST
00	Unmarked	29/09/2018	02:25	7	52	910	Adult	Female	GRS	ST
19	Tagged	07/05/19	23:20	2	55	896	Adult	Male	BS	ST
	Capture #1	09/05/19	23:40	4		889			PSM	CH
20	Tagged	08/05/19	00:20	3	52	795	Adult	Male	GRT/PSM	CH
21	Tagged	08/05/19	03:40	5	56	940	Adult	Male	GRT	FO
	Capture #1	14/05/19	02:15	6		959			GRS	FO
	Released	30/05/19			56	1014				
26	Tagged	08/09/19	00:15	4	52	762	Adult	Female	GRS	FO
	Capture #1	10/09/19	03:53	12		842			GRS	SL
	Capture #2	12/09/19	23:55	5		741			GRS	ST
28	Tagged	09/09/19	23:23	2	34	215	Juvenile	Female	BS	FO
Coombe Country Park										
1	Tagged	12/09/18	22:45	5	53	798	Adult	Female	GRS	FO
	Capture #1	18/09/18	01:45	5		862			WO	ST
	Capture #2	03/05/19	23:45	7		1072			GRS	SL
	Capture #3	05/05/19	02:30	5		1117			GRS	ST
	Capture #4	06/05/19	23:23	10		1098			GRS	FL
	Capture #5	09/05/19	03:45	7		1140			GRS	CH
	Capture #6	07/09/19	02:05	5	55	1062			BS; GRS	FO
	Capture #7	08/09/19	01:52	10		1082			BS	ST
	Capture #8	11/09/19	23:47	10		1034			GRS	ST
	Capture #9	16/09/19	23:33	6		1151			GRS	FO
2	Tagged	12/09/2018	23:28	15	51	966	Adult	Female	GRS	ST
	Capture #1	18/09/2018	00:46	10		952			GRS; BS; WO	FO
3	Tagged	13/09/18	00:11	10	45	554	Subadult	Female	GRS; BS; WO	ST
	Capture #1	17/09/18	23:50	15		574			GRS	ST
	Capture #2	19/09/18	22:37	10		568			BS	FO
	Capture #3	24/09/18	23:47	12		573			GRS	FO
	Capture #4	05/05/19	00:20	15	47	538	Adult		GRS	FO
	Capture #5	07/05/19	02:55	8		505			GRS	FO
	Capture #6	17/09/19	00:47	5	49	979			BS; GRS	FO
4	Tagged	13/09/2018	00:41	8	47	562	Subadult	Female	WO	SL
	Capture #1	18/09/2018	02:58	18		628			GRS	FO
5	Tagged	13/09/18	01:30	0	46	587	Subadult	Male	GRS	ST
	Capture #1	19/09/18	23:20	8		620			WO	FO
	Capture #2	07/05/19	01:20	2	51.5	880	Adult		TH	CH
	Capture #5	09/05/19	03:45	7		851			GRS	CH

6	Tagged	13/09/2018	02:50	17.5	46	574	Subadult	Female	GRS	ST
	Capture #1	17/09/2018	22:27	5		545			GRS	ST
7	Tagged	13/09/18	03:57	6	49	781	Adult	Female	GRT	ST
	Capture #1	04/05/19	01:00	1	51	772			GRT	ST
	Capture #2	05/05/19	03:05	3		759			GRT	ST
	Capture #3	07/05/19	01:20	2		737			TH	CH
	Capture #4	08/05/19	22:20	10		743			GRS	CH
	Capture #5	07/09/19	01:15	5	50	959			BS; GRS	ST
	Capture #6	09/09/19	02:45	10		988			GRS	FO
	Capture #7	12/09/19	01:10	8		971			BS; GRS	FO
	Capture #8	17/09/19	01:10	10		1021			GRT	FL
9	Tagged	18/09/18	02:14	2	37	290	Juvenile	Male	RP; GRT	FO
	Capture #1	25/09/18	01:37	5		318			WO	FO
	Capture #2	04/05/19	03:55	2	51	840	Adult		GRS	ST
	Capture #3	05/05/19	02:53	6		819			GRT	ST
	Capture #4	08/05/19	22:20	10		771			GRS	CH
	Capture #5	06/09/19	23:18	10	54	1010			BS; GRS	SL
	Capture #6	17/09/19	00:25	4		1061			BS; GRS	ST
12	Tagged	04/05/19	00:20	2.5	50	854	Adult	Female	GRS	ST
	Capture #1	07/05/19	00:30	20		833			GRS	CH
13	Tagged	24/09/2018	22:39	4	37	345	Juvenile	Female	GRS	FO
14	Tagged	04/05/19	01:30	5	55	950	Adult	Male	GRS	FO
	Capture #1	05/05/19	00:40	5		917			WO/BS	CH
	Capture #2	09/05/19	00:45	20		978			BS	FO
	Capture #3	12/09/19	02:25	10	52	1035			GRS	ST
16	Tagged	04/05/19	04:15	1	51	913	Adult	Male	GRS	CH
	Capture #1	07/05/19	00:30	20		769			GRS	CH
17	Tagged	04/05/19	23:35	10	53	783	Adult	Female	GRS	CH
	Capture #1	09/05/19	01:50	20		948			GRS	FO
	Capture #2	06/09/19	23:33	10	50	955			BS; GRS	ST
	Capture #3	09/09/19	03:08	6		1057			GRS	FO
	Capture #4	12/09/19	00:25	15		964			GRS	SL
	Capture #5	17/09/19	01:10	5		1085			BS; GRS	ST
18	Tagged	04/05/19	23:35	10		803	Adult	Male	GRS	CH
	Released	20/05/19			51	885				
	Capture #1	17/09/19	01:32	7	54	1182			BS; GRS	ST
22	Tagged	07/09/19	00:23	6	38	351	Juvenile	Female	GRS	ST
	Capture #1	12/09/19	04:07	15		446			GRS	ST
23	Tagged	07/09/19	00:55	10	52	1192	Adult	Male	GRS	ST
24	Tagged	07/09/19	03:16	10	36	304	Juvenile	Male	GRS	ST
	Capture #1	09/09/19	03:22	8		312			GRS	ST
	Capture #2	12/09/19	02:45	10		364			GRT	FO
25	Tagged	07/09/19	03:30	10	39	361	Juvenile	Male	GRS	FO
	Capture #1	08/09/19	23:26	7		365			GRS	FO
	Capture #2	12/09/19	02:43	8		427			GRS	FO
	Capture #3	17/09/19	02:40	8		485	Subadult		GRS	FO
27	Tagged	09/09/19	03:38	20	38	355	Juvenile	Male	BS; GRS	FO
29	Tagged	12/09/19	00:10	4	42	504	Subadult	Female	GRS	FO
30	Tagged	12/09/19	00:42	15	46	692	Adult	Male	BS; GRS	ST
	Capture #1	16/09/19	23:50	2		745			BS; GRS	ST
31	Tagged	12/09/19	03:07	10	38	306	Juvenile	Male	GRS	ST
32	Tagged	12/09/19	03:45	10	44	642	Subadult	Female	BS; GRS	ST
	Capture #1	17/09/19	03:17	15		677			BS	FO
33	Tagged	17/09/19	00:10	5	42	522	Subadult	Female	BS; GRS	ST

Table 7. Hedgehogs captured during 2018-19 torchlight surveys (Orange – Sept 2018; Green– May 2019; Blue – Sept 2019). Habitat codes: GRS Grass < 10cm tall; GRT Grass - cut > 10 cm tall; OR Orchard; PSM Planted shrubberies/flower beds; RP Recent plant-colonised disturbed site; WO Woodland floor; BS Bare soil; OR Other. Behaviour codes: FO foraging; SL Slow locomotion; ST Stationary.

As can be seen in Figure 14 below, the number of hedgehogs found at Castle Bromwich was consistently low, but numbers increased each survey period at Coombe Country Park, with almost double the number found in September 2019 than in September 2018. Figure 15 shows that more females persisted in the population than males at Coombe but not Castle Bromwich. Interestingly, no adult males were found at Coombe in September 2018, and only one young hedgehog (subadult/ juvenile) was found across years at Castle Bromwich. Indeed, a much greater proportion of hedgehogs found at Coombe were young than at Castle Bromwich (see Figure 16), making up to two thirds of the captured population.

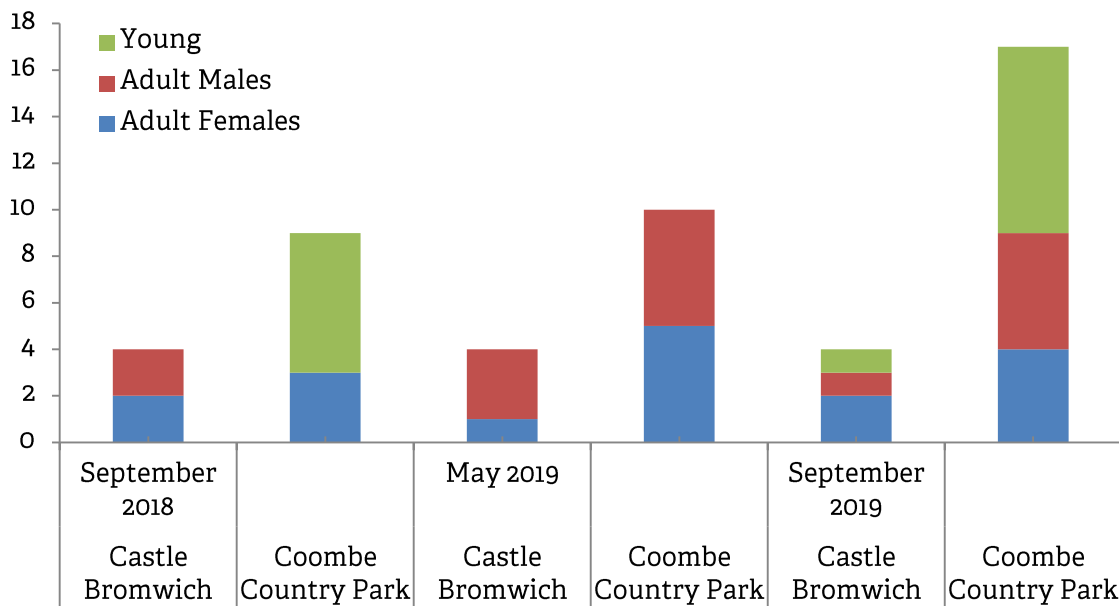


Figure 14. Numbers of hedgehogs captured at each hedgehog hub during each survey period. In September surveys, adult animals taken as ≥ 700 g but adults and young were not distinguished in May surveys.

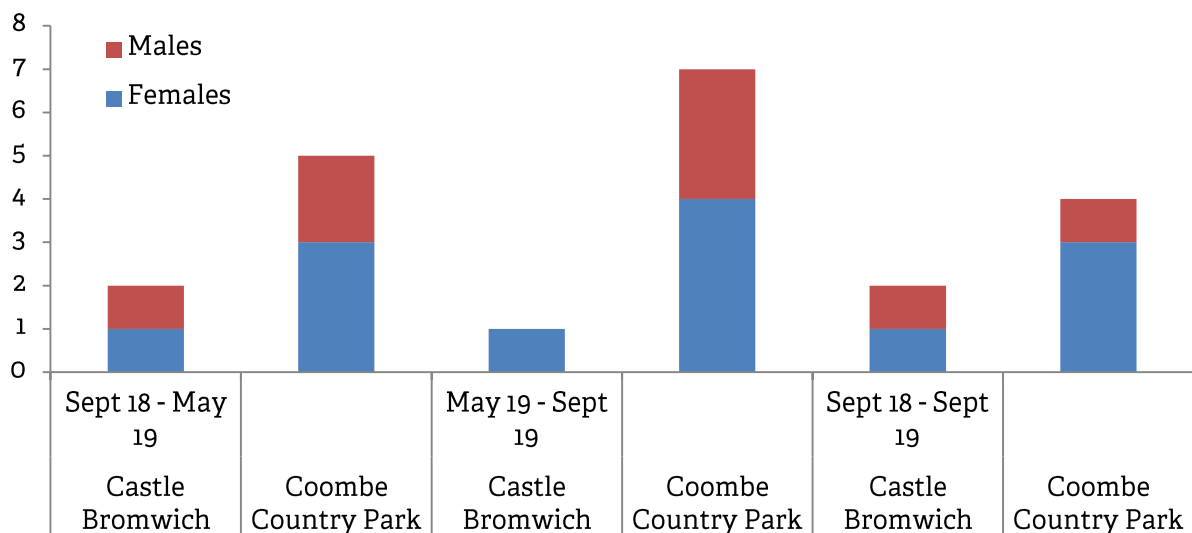


Figure 15. Numbers of hedgehogs at each hedgehog hub persisting between survey periods.

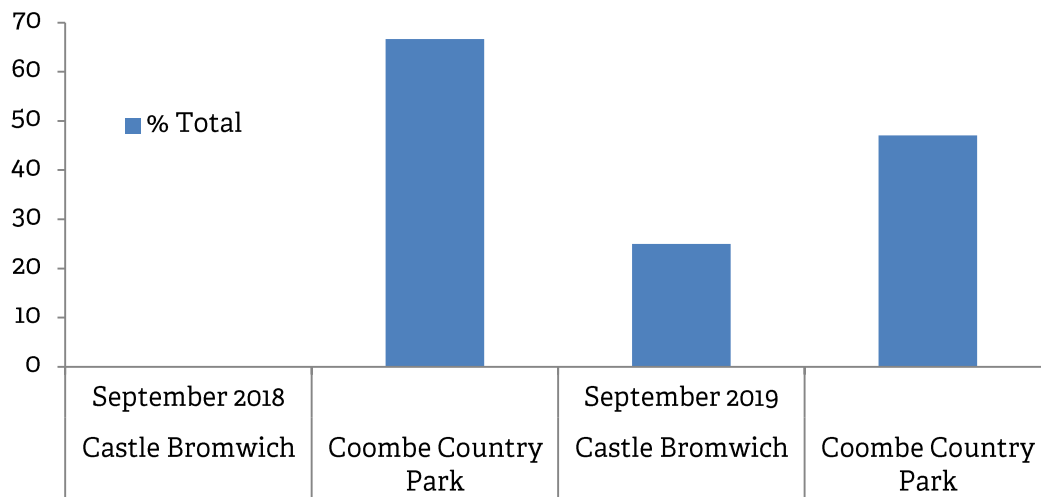


Figure 16. Percentage of hedgehogs captured at each hedgehog hub each September that were young (< 700g).

It was necessary to pool the data across sites for inferential statistical analysis, owing to the minimal dataset from Castle Bromwich. Additionally, only three adult hedgehogs were seen at every survey period, meaning that a repeated measures analysis was not possible, despite some measurements having been taken multiple times from the same sample. However, some analysis was possible. Using pooled data across sites and years, a two sample t-test revealed that there was no significant difference between weights of males and females ($p = 0.37$). An ANOVA analysis showed that the mean weights of hedgehogs differed between survey period and that this trend was approaching significance ($p = 0.05$). A follow-up t-test revealed that hedgehogs were larger in September 2019 than in 2018 ($p = 0.02$) but there was no interaction effect with sex.

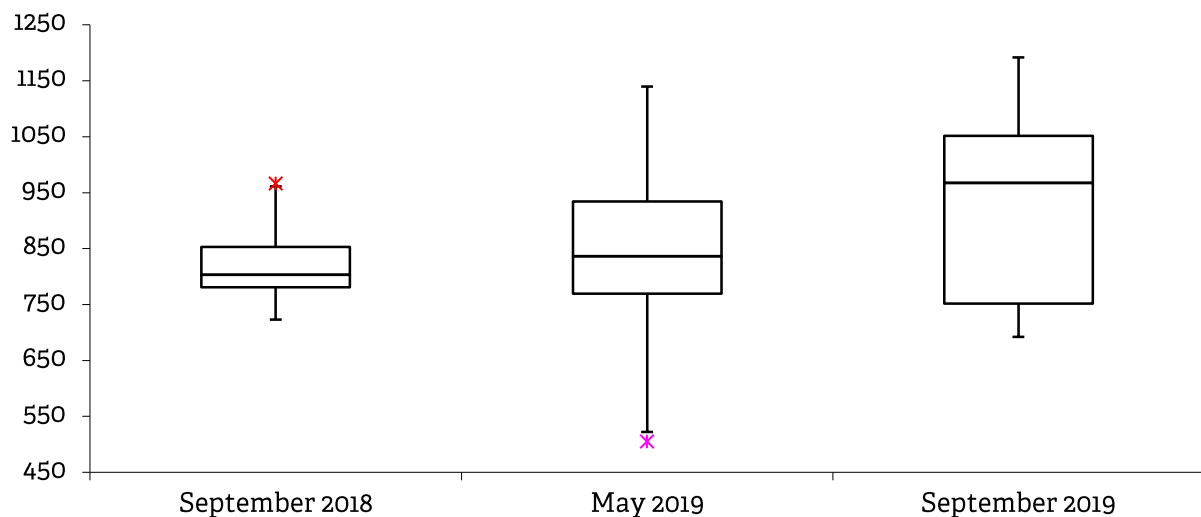


Figure 17. Box plots of adult hedgehog body weights across sites during each survey period. The box represents the interquartile range, the whiskers the highest and lowest values, the horizontal lines the mean values, the red star the maximum outlier and the purple star the minimum outlier.

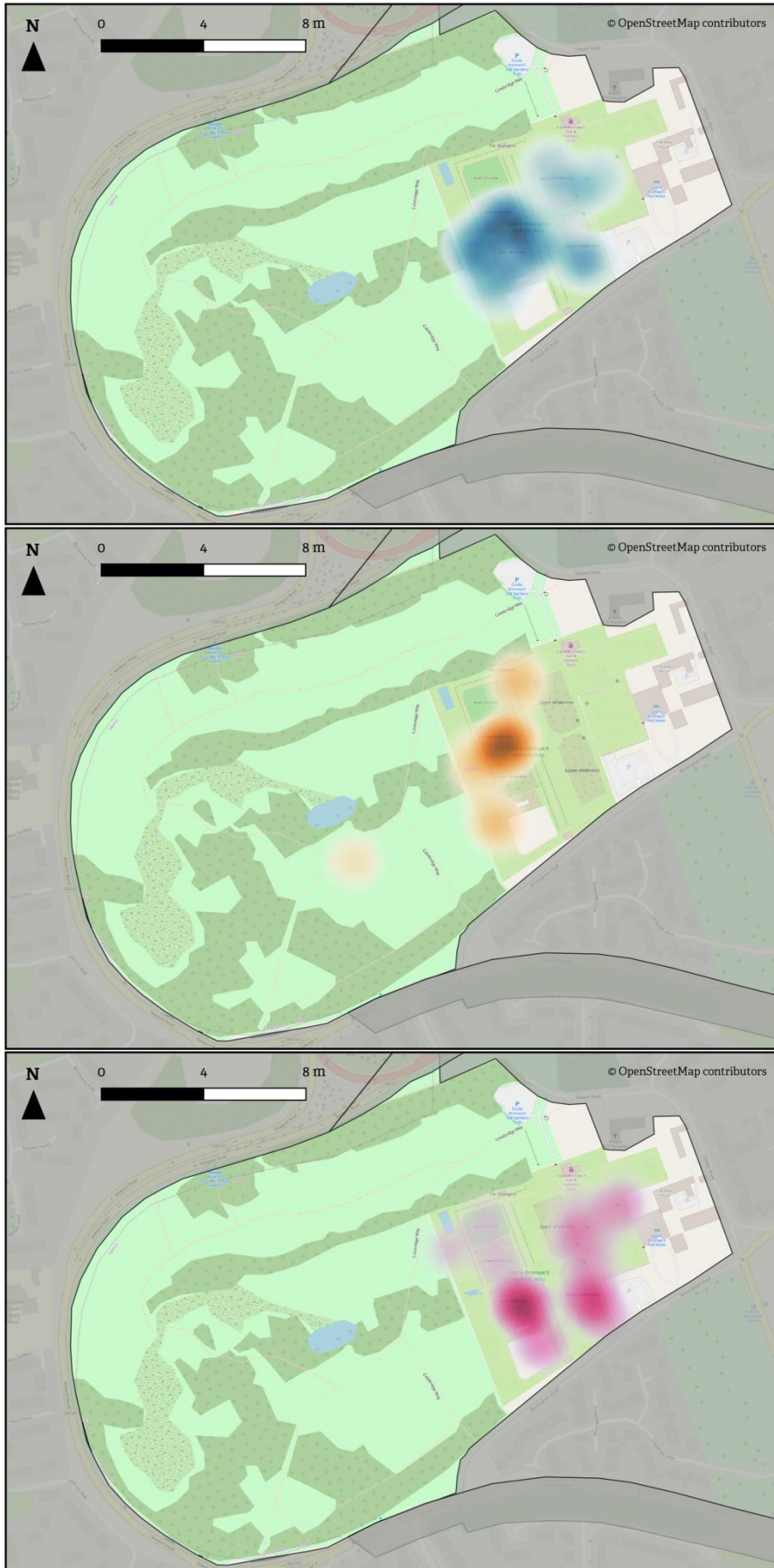


Figure 18. Heat maps to show hotspots of hedgehog activity during torchlight surveys of Castle Bromwich in September 2018 (top), May 2019 (middle) and September 2019 (bottom). Copyright WWT.

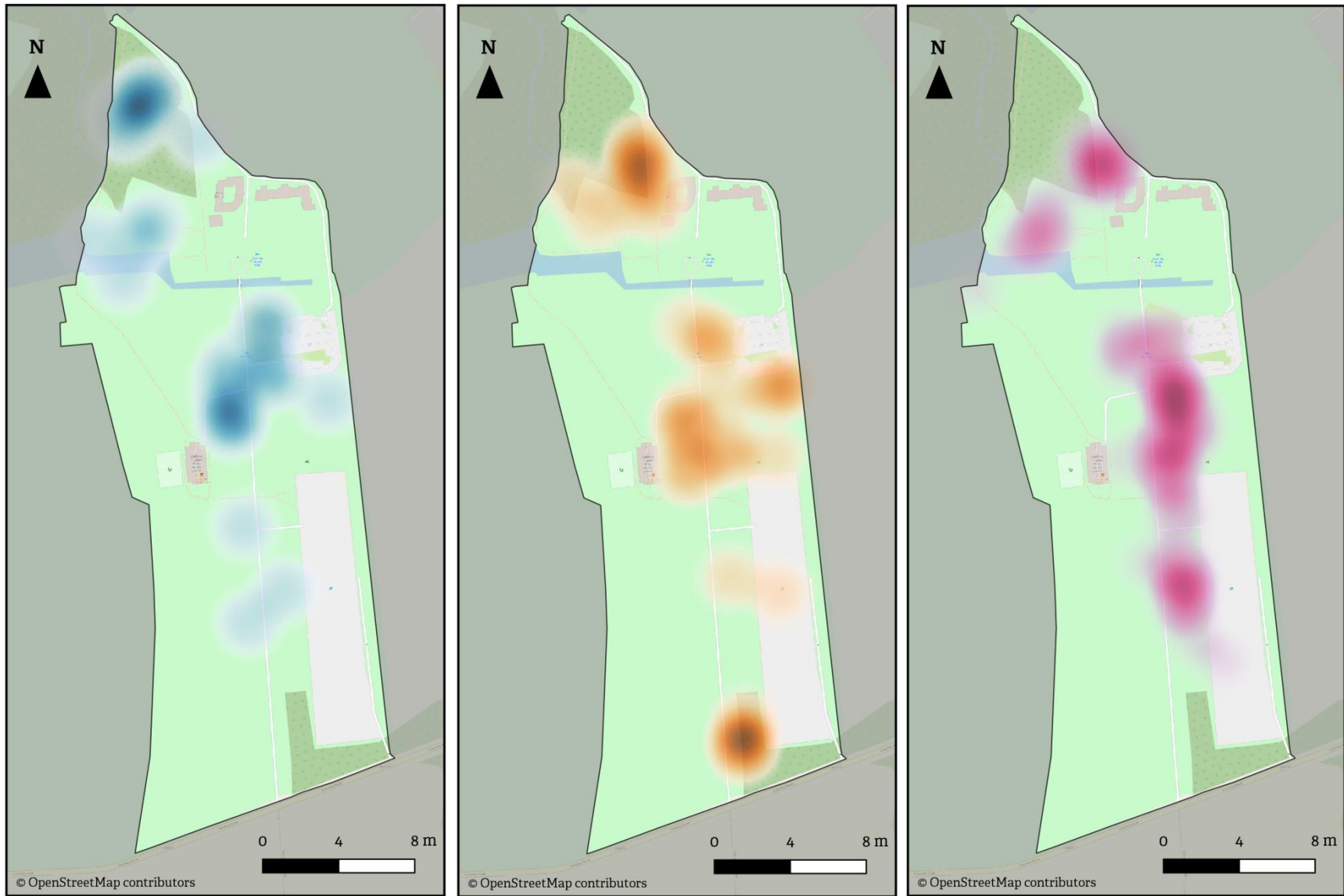


Figure 19. Heat maps to show hotspots of hedgehog activity during torchlight surveys of Coombe Country Park in September 2018 (left), May 2019 (middle) and September 2019 (right). Copyright WWT.



Figure 20. Minimum Convex Polygons (MCPs) drawn around the locations for hedgehogs captured more than once during torchlight surveys of Castle Bromwich in September 2018 (top), May 2019 (middle) and September 2019 (bottom). Copyright WWT.



Figure 21. MCPs drawn around the locations for hedgehogs captured more than once during torchlight surveys of Coombe Country Park in September 2018 (left), May 2019 (middle) and September 2019 (right). Copyright WWT.

Figures 18 and 20 show that the lower flowerbed in Castle Bromwich Hall Gardens was a particular hotspot, where hedgehogs were frequently found foraging. The upper flowerbeds were used each September but not in May, suggesting different foraging strategies at this time of year. Hedgehogs were also found foraging by hedges and in the orchard. Hedgehogs were generally found courting in areas of more short cropped lawn.

Figures 19 and 21 show that hedgehogs were generally found in the formal gardens area at Coombe, along the driveway and in areas surrounding the car parks. The hedgehogs were often found both courting and foraging at the base of old trees (which line the driveways), along woodland edge and in herbaceous/scrub vegetation near the car parks. Interestingly, the latter is in line with findings from surveys at Regent's Park.



Figure 22. Favoured foraging sites at Castle Bromwich Hall Gardens amongst flowerbeds (left), copyright Tara Higgs, and at Coombe Country Park amongst old trees lining the driveway (right), copyright Deborah Wright (right).

Figure 21 also shows some interesting patterns in the MCPs of individual hedgehog movements at Coombe, despite the dataset being fairly limited and not necessarily denoting “home range”, rather where the hedgehogs were found during that survey period. For example, hedgehog 09 was first found as a juvenile male in September 2018, when he was seen across a small range. This range was much larger the following May, presumably when he was roaming looking for females during the rut. Again, the range appeared to shrink in September 2019 when he was no longer looking for females and was preparing to hibernate. The opposite is true for adult female 17, who had a small MCP in May 2019 as she prepared for young and a larger MCP in September when she was presumably foraging across a wider area, seeking to put on weight quickly before hibernation.

The hedgehogs found were generally healthy, with eight hedgehogs on average each survey period having some ectoparasite loading of fleas and/or ticks, but usually within ‘normal’ bounds. One hedgehog was taken in for rehabilitation in September 2018 owing to lungworm and a high parasite loading. Two additional hedgehogs were taken in for rehabilitation in September 2019, one for multiple infected strimmer wounds, and one again for lungworm and a high parasite loading. All three hedgehogs were rereleased back where they had been found.

The relatively stable populations and health of the hedgehogs is encouraging, as well as the higher numbers found in September 2019, perhaps reflecting good conditions for hedgehog breeding. Indeed, 12 of the 14 hedgehogs found in May were discovered courting at some stage. Both sites have made considerable efforts to improve habitats for hedgehogs over the course of

the project, as discussed in the next section. However, the number of hedgehogs found at Castle Bromwich remains small and the hedgehogs themselves seem to be smaller in size. The adult hedgehogs found at Coombe in September 2019 were all over 950g (mostly over 1000g) but at 700g or above at Castle Bromwich. The overall site is smaller to survey and hedgehogs are likely missed amongst high vegetation on the BCC land, but other factors may also be impacting the hedgehogs. For example, the prolonged summer drought in 2018, or potentially an unknown disease or poisoning outbreak when 3 hedgehogs were found dead within a two week period. Only one female was found in May and only one young in September, suggesting low breeding and recruitment rates in the population. Continued monitoring may reveal more over time.



Figure 23. A captured hedgehog being given a health check before the spines are marked with numbered tubes (top left), copyright WWT; Hedgehog Handlers in training (right), copyright WWT; A hedgehog being marked (bottom left), copyright Simon Watts.



Figure 24. Hedgehog 10 with a missing rear leg (left) and a hedgehog with a healed strimmer injury (right). Copyright Deborah Wright.

Although this monitoring is still in its early stages, it has already revealed some interesting findings. For instance, one of the hedgehogs that was rehabilitated, was reencountered during

the next survey period, showing that it had survived the process and gone on to prosper at over 1100g. Another hedgehog that had been marked in September 2018 was reencountered in September 2019 but had lost a rear leg that had since healed over. This injury did not appear to have impeded movement or ability to find food, as the hedgehog's weight was stable across survey periods. Another hedgehog that was found in May 2019 had first been marked in September 2018 at just 290g, showing that it had been able to survive overwinter from such a low weight. Insights such as these from long-term studies are invaluable and this monitoring is likely to yield more in the future. The surveys were also popular with the media, with awareness raised through coverage on *BBC Midlands Today* and local newspaper articles as well as a promotional video taken by videographer Simon Watts. Torchlight surveys will now be taken over by WMG, with two *Warwickshire Hedgehog Handler* volunteers having been trained in handling and marking the hedgehogs and added to the licence over the course of the project.

3. Habitat Improvement

3.1. Policy

In partnership with local authorities, the HIA project pushed to include hedgehogs in local policy. Rugby's *Local Plan* was adopted in June 2019 and includes a statement encouraging maintenance and/or enhancement of connectivity and biodiversity of residential and non-designated green space. This is a legacy created from the project, with a Local Plan determining the type and location of development in the future, which *Neighbourhood Area Plans (NAPs)* must adhere to. Solihull's Local Plan is still under review following a legal challenge and changes due to HS2. Recommendations for mitigation relating to *Local Biodiversity Action Plan* species, such as hedgehogs, are currently included and the importance of a green infrastructure network emphasised.

Within Solihull borough there are now eight designated *Neighbourhood Areas (NAs)*: Cheswick Green, Meriden, Dickens Heath, Knowle, Dorridge and Bentley Heath, Hampton-in-Arden, Hockley Heath, Balsall and Berkswell. Three NAPs, which give communities a say over the type, location, size, pace and design of development in the area, have been adopted, one of which was before the hedgehog work on NAPs began. Following involvement from the HIA project, the remaining two NAPs to be adopted include statements regarding hedgehogs and permeable barriers, safeguarding connectivity across the NAs into the future.

Within Rugby, there are now nine designated NAs: Coton Forward, Wolston, Brandon and Bretford, Wolvey, Brinklow, Ryton-on-Dunsmore, Willoughby, Dunchurch and Grandborough. Coton Forward's NAP was adopted before the hedgehog work began. Only one other NAP has since been adopted by Brandon and Bretford, which includes a statement regarding the importance of hedgehogs, permeable barriers and native species hedgerows. All other NAs for both Solihull and Rugby have been contacted with advice and guidance for their upcoming draft plans, and were given a copy of a specifically designed NAP leaflet.

3.2. Development

Hedgehogs are unusual in that they prefer garden habitat and living alongside people, so degraded rural land that is being developed actually has the potential to offer hedgehogs a net gain in habitat. Although, as a Schedule 6 rather than Schedule 5 species on the *Wildlife and Countryside Act*, developers largely need not survey or mitigate for hedgehogs, and any

hedgehog-friendly measures put in place are based on goodwill and the potential for positive publicity. Previous attempts to change the law were unsuccessful. However, the HIA project successfully pushed for hedgehog-friendly features in developments since 2016, working with the WWT Planning and Biodiversity Officer, local authorities, ecologists and developers in the process. The Senior Hedgehog Officer provided comments on relevant planning applications, tailoring responses to each case, using sightings information, emphasising local policy and offering to map hedgehog fence holes. Suggestions for new developments included:

- Fence panels with hedgehog holes at the base
- Limiting brick walls and/or some bricks removed from the base
- Raised gates
- Sloped access/escape routes
- Sympathetic planting
- Minimising hard standing
- Native species hedgerows
- Other features e.g. ponds, log piles
- Caution when clearing the ground e.g. deadwood, leaves, long grass

Ecological consultancies, for example, *GS Ecology* and *FPCR Environment and Design* are now suggesting features such as these, particularly hedgehog holes, in ecological reports. Suggestions did not include hedgehog houses, which although can be seen as an ‘added bonus’, currently have little evidence base for being used as mitigation and/or enhancement.

Overall, 15 development sites across the HIAs are now set to include hedgehog-friendly measures, with a further three additional sites elsewhere in the county. The measures were secured in a variety of ways, for instance through the planning process itself, through planning conditions and through the *Construction Environmental Management Plan (CEMP)*.

Development Site	Area	Planned inclusions
Cawston extension	Rugby	Hedgehog Holes for 50 out of 214 dwellings
Cawston extension	Rugby	Hedgehog Holes for 50 out of 184 dwellings
Houlton	Rugby	Hedgehog Holes for 183 out of 183 dwellings
Houlton	Rugby	Hedgehog Holes for 60 out of 180 dwellings
Hampton-in-Arden	Solihull	Informative in decision notice regarding hedgehog houses and fence holes for 9 dwellings.
Hampton-in-Arden	Solihull	Hedgehog Holes for 45 dwellings and raised gates; Some planned fences and walls to be replaced with hedgerows. Secured by condition.
Cawston extension	Rugby	Hedgehog Holes for 40 out of 250 dwellings. Secured by condition.
Cawston extension	Rugby	Hedgehog Holes for 2 out of 15 dwellings.
Houlton	Rugby	Hedgehog Holes for all 253 dwellings.
Overslade	Rugby	Hedgehog Holes for all 5 dwellings. Secured by condition.
Ashlawn Road	Rugby	Decision notice condition stipulates plans for fences showing hedgehog hole mitigation measures for 10 dwellings; CEMP stipulates ramps, covered holes & checks of spoil heaps
Houlton	Rugby	Hedgehog holes stipulated in Ecological Statement every 50m along school boundary; locations discussed with <i>Warwickshire County Council (WCC)</i>
Ryton-on-Dunsmore	Ryton	Informative note in decision notice regarding caution & hedgehog holes for 29 dwellings
Bilton Road	Rugby	Informative note in decision notice regarding caution & hedgehog holes for 7 dwellings
Houlton	Rugby	Hedgehog holes mapped for 39 dwellings

Table 8. Developments planning hedgehog-friendly inclusions across the HIAs.

The Senior Hedgehog Officer also wrote material for the publication “Hedgehogs and Development” in 2019 with the *People’s Trust for Endangered Species (PTES)* and BHPs. This now provides guidance that can be used and referred to nationwide into the future, without the need for time-consuming tailored comments on planning applications. The guidance was disseminated widely to key audiences, including members of the *Chartered Institute of Ecology and Environmental Management*.

3.3. Public Green Space

During the HIA project, volunteers were involved in over 500 hours of habitat improvement works across greenspaces. Practical habitat workshops and events were held with community groups, local authorities and corporate groups. Activities included planting, litter picking, hedge maintenance, hedgelaying, removal of invasive species and dead hedge creation. The improvements aimed to create nesting and foraging habitat, as well as to increase connectivity, facilitating freer movement of hedgehogs across the landscape.

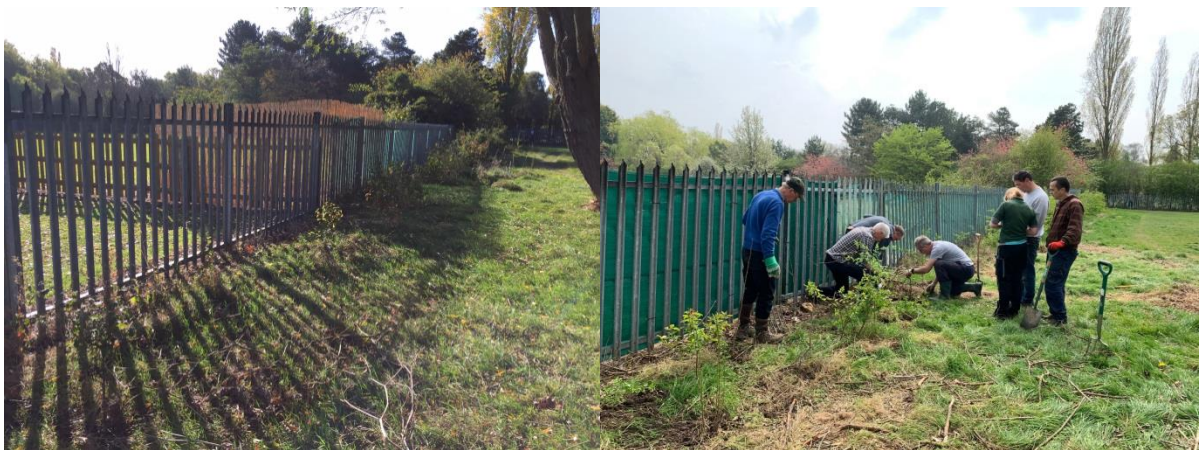


Figure 25. A hedge planted by volunteers in an SMBC park, increasing connectivity along a barren edge. Copyright Tara Higgs.



Figure 26. Before (left) and after (right) the creation of a dead hedge by volunteers in a Solihull nature reserve. Copyright Tara Higgs



Figure 27. A hedge before being laid on an RBC recreation ground in February 2019 (top left) and its growth progress by July 2019 (top right); A hedge being laid by volunteers on a WWT nature reserve in February 2018 (bottom left) and its growth progress by September 2019 (bottom right). Copyright Deborah Wright.



Figure 28. A hedge planted by FERG and volunteers in an RBC site, with progress made (right) in increasing connectivity and habitat on the edge of a playing field. Copyright Deborah Wright.



Figure 29. A hedge laid by volunteers on a farm in Rugby in November 2018. Copyright Deborah Wright.



Figure 30. Making amenity grassland habitat available to hedgehogs in a residential area by making holes along the edge in the fence, copyright Deborah Wright (left): A series of litter picks in parks in Solihull improved habitat and made it safer for both hedgehogs and people, copyright Tara Higgs (right).

Schools were also encouraged to improve habitat for hedgehogs following visits. For example, Northlands Primary School created a log pile, Bilton Infant School installed two hedgehog houses, Leamington Hastings C of E Academy created a full wildlife garden and Bilton Grange Preparatory School held a hedgehog house event. Corporate volunteers from *Gro-Organic* dug a wildlife pond and constructed insect hotels and habitat piles to sit amidst a newly planted wildflower meadow in the grounds of Bishop Wilson School, in an otherwise heavily developed area of Solihull.

The hedgehog hub sites were keen to make changes to benefit hedgehogs and sought advice on best practice. Castle Bromwich Hall Gardens were encouraged to continue gardening organically with as few chemicals as possible to increase prey availability. The site also created dead wood areas, a new bug hotel and installed hedgehog houses. Coombe Country Park were advised to avoid chemical use where possible and to keep the grass long around large veteran trees until later in the year, to increase foraging opportunities through increased invertebrate diversity and abundance. Hedgehog crossing area signs were also installed following multiple instances of hedgehogs being killed near the car parks in a fortnight.



Figure 31. Nesting and foraging habitat creation at Castle Bromwich Hall Gardens (top) and hedgehog crossing signs installed at Coombe Country Park to attempt to reduce roadkill (bottom).

A particularly positive relationship with RBC led to more widespread habitat improvements across greenspaces, from hedge planting to create wildlife corridors to the creation of urban grassland meadows. In 2017, RBC reduced the regularity of grass cutting from 13 mows per year to one and planted trees across 5 green space sites. Allowing areas of grass to grow long provides food by increasing habitat for invertebrates and shelter for hedgehogs during summer months. Planting provides leaves for hedgehogs to make their nests. Despite concerns that there would be a high level of complaints, this proved not to be case, potentially due to accompanying signage explaining the changes. The trial was then expanded in 2018 across 7 other locations. The partnership work has now resulted in management changes to 13 sites, creating project legacy with more varied habitat for hedgehogs, and potentially also saving funds on grass cutting. RBC have also now been advised to cut areas of longer grass in the winter when hedgehogs are likely to be sheltering in more robust areas, to minimise use of chemicals to increase invertebrate abundance, to create a mosaic of mixed habitats for hedgehogs to use on sites and consider site connectivity within the wider landscape wherever possible. Chris Worman, the Parks and Grounds Manager has said, “Working in partnership on the Hedgehog Improvement Area has proved to be a great success and has successfully influenced both the management of our own green spaces and those of new developments.”



Figure 32. An RBC site subject to trial in 2016 before any changes (top left), 2017 post changes with interpretation (top right) and subsequent years 2018 (bottom left) and 2019 (bottom right). Copyright WWT.

At the end of 2019, a *Hedgehog Ecology and Management for Practitioners (HEMP)* course was held in Rugby by the Senior Hedgehog Officer, with 8 attendees learning how to best manage land for hedgehogs. A *Warwickshire County Council (WCC)* Planning Officer also led a session on how to include hedgehogs in the planning system. Attendees included ecologists, recorders and local authority employees, who can now use their knowledge to influence both developments and greenspace management.

4. Other work

4.1. Front garden surveys

In 2015, a front garden survey audit was taken of the 96 streets in the focal area of Elmdon Ward, Solihull. Counts were undertaken based upon each garden's percentage cover of green space. The survey revealed that a mean of 21% of houses per street were considered to have over 25% front garden green space and just 3% had 100% green space. A mean of 12% of houses per street had 0% green space, characteristically covered entirely with tarmac, gravel or paving.

In 2016, a front garden survey audit was also undertaken of Cawston, a key area of urban sprawl in Rugby. Encouragingly, the survey revealed that the majority (55%) of houses per street on average were considered to have over 25% front garden green space and 12% had an average of 100% green space. However, similarly to Elmdon, 11% had an average of 0% green space, largely comprising tarmac, paving and shingle. These increasingly common spaces nationwide limit the available habitat for hedgehogs and potentially impact their movement across the landscape.

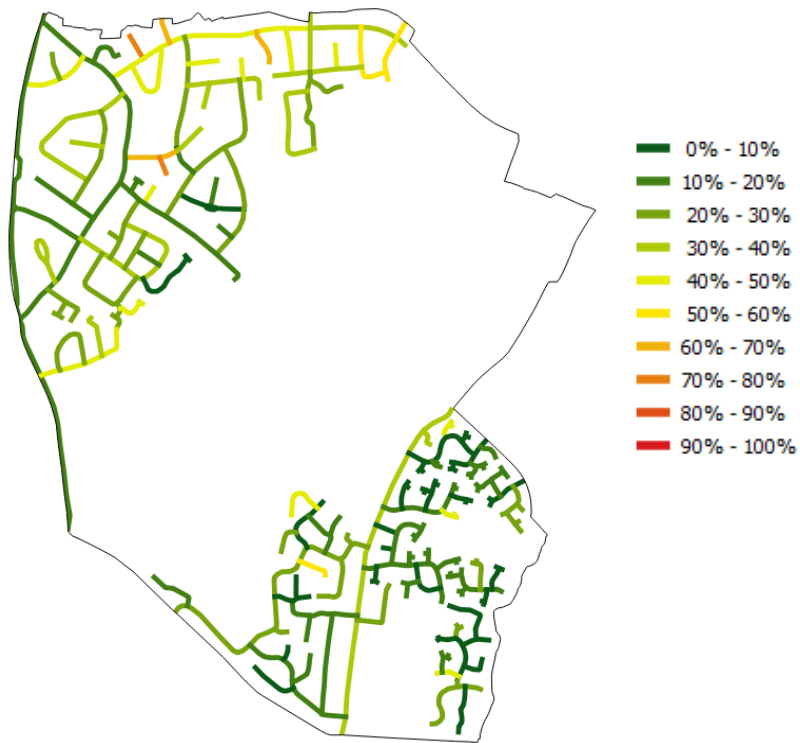


Figure 33. Front garden survey heat map showing the percentage of houses on each street in Elmdon with 0% green space.

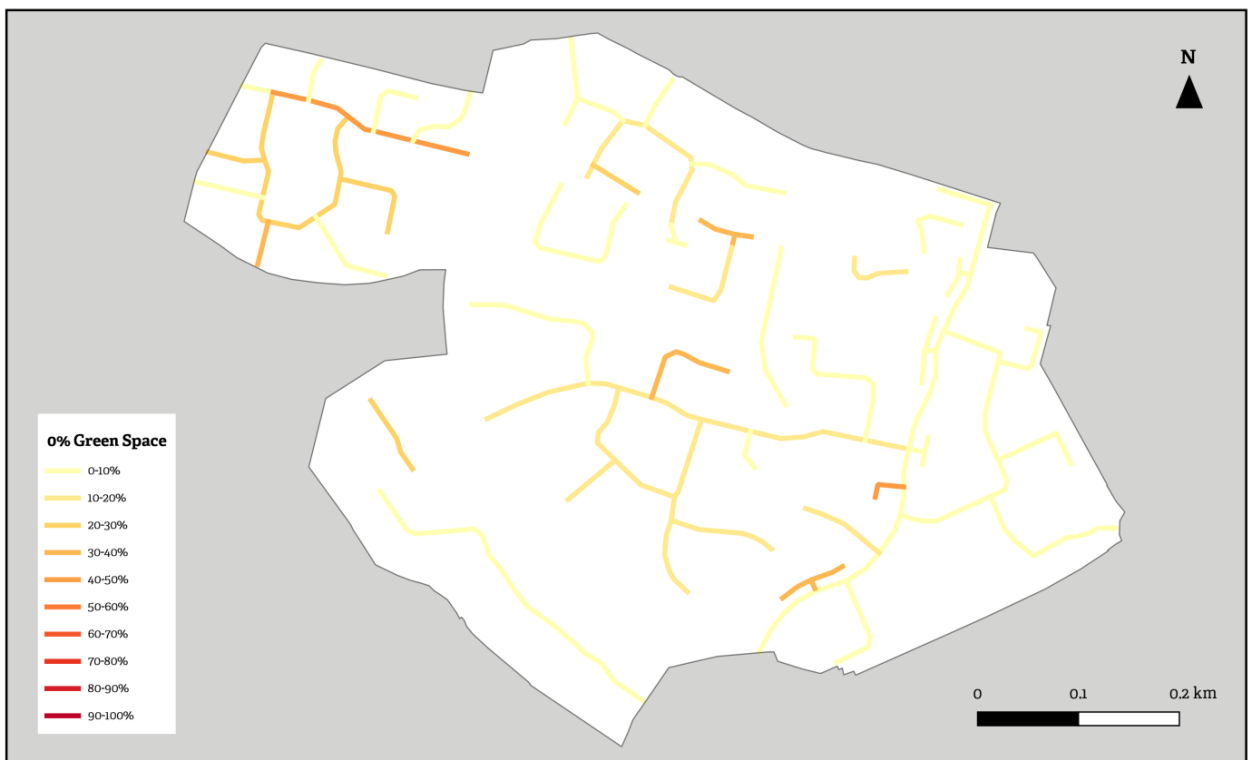


Figure 34. Front garden survey heat map showing the percentage of houses on each street in Cawston with 0% green space.

4.2. Connectivity surveys

In 2017, a random sample of 10% (n=9) of the 94 residential streets within Elmdon was taken to quantify residential habitat fragmentation. 388 boundaries were assessed as to their street level permeability: the fence's capacity to allow hedgehogs to travel from the street to the back garden of the property. The material which the boundary was made from and the length of each boundary was recorded. 24% of boundary features were rated as permeable or open but the majority, 76%, were rated as impermeable. The most commonly occurring boundary type was the wooden fence (39%) but of the wooden fences surveyed, only 6% would allow access for hedgehogs. This highlighted the importance in promoting the use of hedgehog-friendly gravel boards and the creation of hedgehog holes in wooden fences to significantly increase permeability and free movement of hedgehogs.

4.3. Allotment surveys

During 2018, 60 allotment holders across 25 allotment sites in the HIAs took part in a short survey regarding hedgehogs and plot management. 75% said they had never seen a hedgehog onsite, with 12% only having seen signs of hedgehogs; either footprints, dropping or nests. It is likely hedgehogs had been missed since they are nocturnal and although some holders were knowledgeable, others may not have recognised hedgehog signs. However, it is also likely that low numbers of hedgehogs sighted may have been linked to lack of surrounding habitat connectivity and limited access to bounded sites.

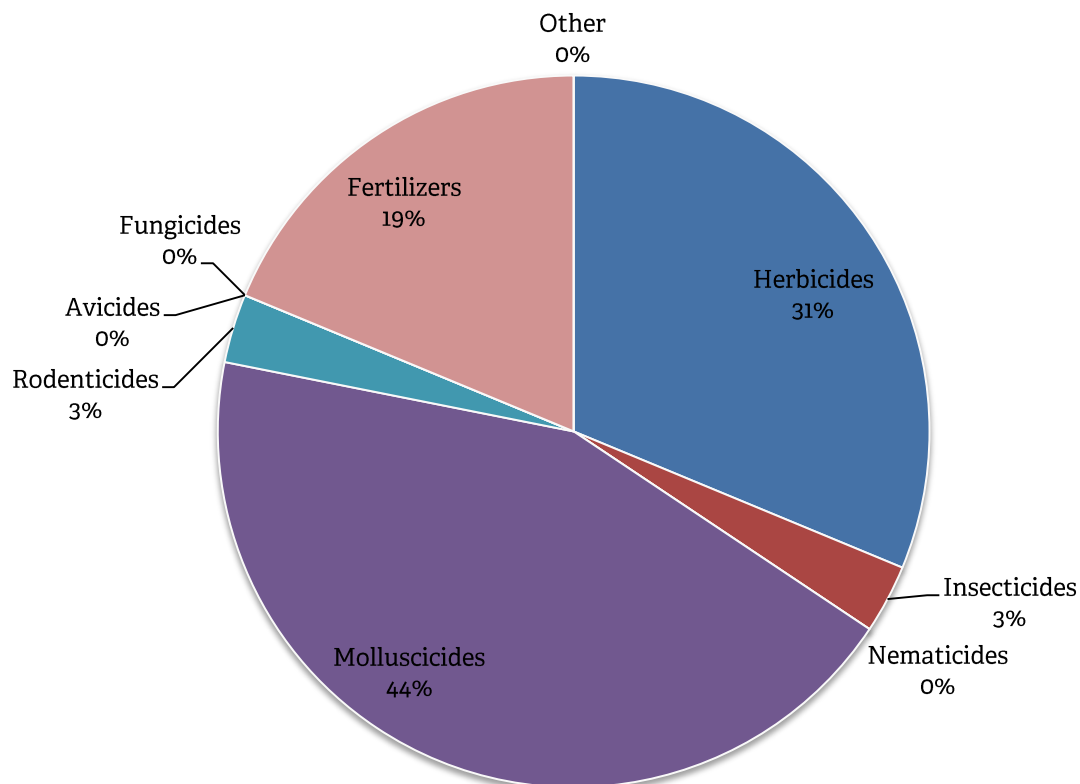


Figure 35. Percentages of types of chemicals used by allotment holders who responded that they used chemicals on their plot in a 2018 survey.

Over half (53%) of respondents who were willing to give information on chemical use, said that they used chemicals (Figure 35). Most said that they used weedkillers at certain times of year and

some said they used slug pellets. Encouragingly, some said that they has switched to using organic slug pellets e.g. ferric phosphate, after being made aware of the dangers to wildlife of using metaldehyde. However, several noted the cost implications of this and the fact that traditional slug pellets were being used more widely across the allotments. Multiple sites had an employed pest trapper and so personal rodenticide use was deemed unnecessary, which was a positive finding, given secondary poisoning concerns. Many allotment holders said that felt strongly about gardening organically and used muck, compost and nets rather than chemicals. Holders were provided with BHPS and WWT leaflets covering hedgehog-friendly gardening

4.4. Social surveys

Throughout the first year of the Solihull HIA project, 453 participants were surveyed regarding their understanding of the issues facing hedgehogs. 41% were aware of the current conservation status of the hedgehog, with 64% showing some awareness of ways in which hedgehogs can be helped in gardens. Creating access in the form of fence holes was the theme appearing most frequently in descriptions (26%) with provision of supplementary food (16%) and the creation of 'wild areas' within the garden also being frequent in answers (14%). 74% considered their garden to have holes or gaps in the boundary. Only 10% considered hedgehog presence unimportant or very unimportant. The majority of participants cited the importance of native wildlife and hedgehogs being a 'gardener's friend' as themes relating to their importance. Despite 41% of participants stating an awareness of hedgehog conservation status, the fact that hedgehogs are in decline was only mentioned in 5.26% of responses.

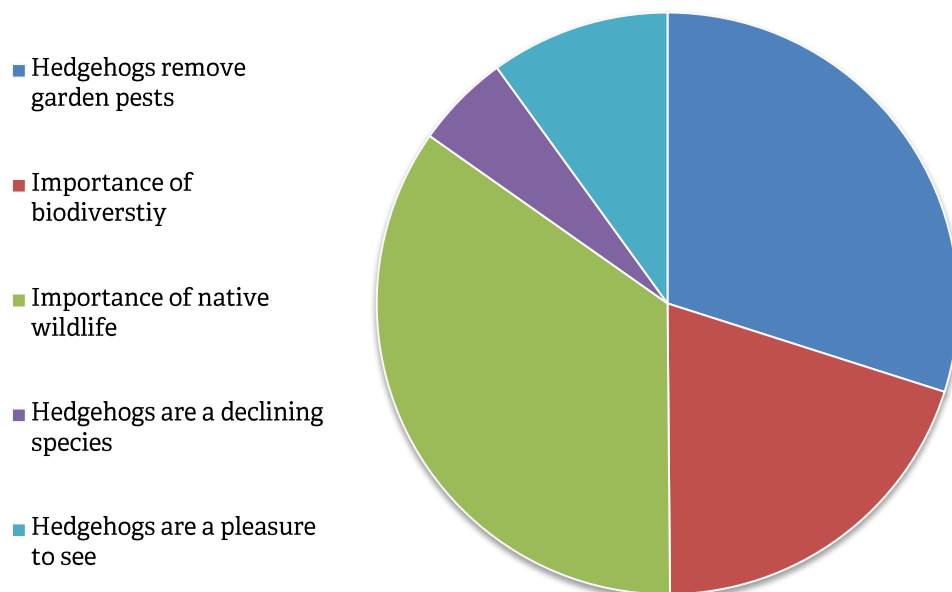


Figure 36. Proportion of use of key themes when describing why hedgehogs are important to participants in a 2015 survey.

In 2016, 55 Rugby residents completed a similar social survey. The survey results suggested a more informed audience, with 78% aware of the national conservation status of hedgehogs and 72% aware of things that they could do to help hedgehogs in their garden. They were enthused about hedgehogs, with 90% saying that hedgehogs were important to them. They also had a will

to help hedgehogs, with 73% of respondents rating that they frequently or always tried to make their garden or local green space hedgehog-friendly. However, their actions appeared to be largely private, confined to their own gardens, with 73% reporting that they either infrequently or never helped with projects to improve habitat for hedgehogs, and never wrote letters or sent emails to people asking them to help hedgehogs. Encouragingly, 31% reported having seen positive changes in local residents' behaviour towards hedgehogs and conservation since the HIA began. Furthermore, 90% said that an awareness of the Rugby HIA meant that they were likely to take action to help hedgehogs in the future.

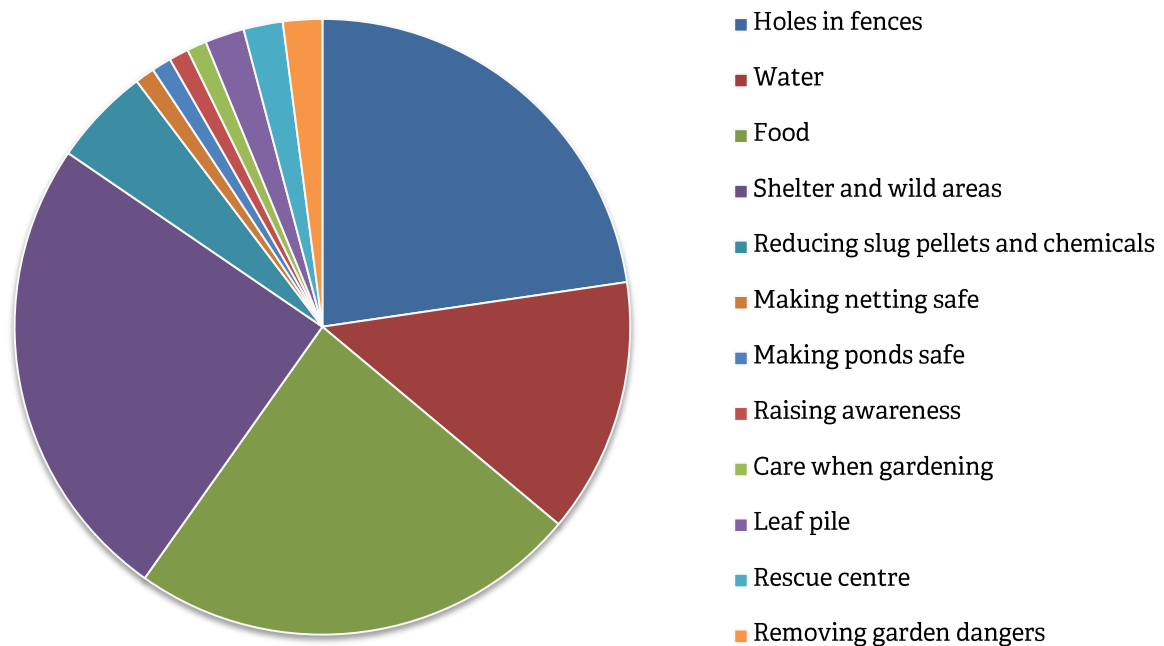


Figure 37. Proportion of themes used when describing ways to help hedgehogs in green space.

During 2019, 37 residents of Olton completed a short survey regarding having a hedgehog-friendly garden. Olton had previously been selected as a focal area of the Solihull HIA due to the potential to create a substantial habitat corridor through the heart of the urban West Midlands, connecting residential greenspace with parkland, a golf course, school grounds, allotments, a cemetery, a cricket club, sports pitches and a historic oak woodland. 54% of residents said they had seen hedgehogs in their garden. Hedgehogs were deemed to have access to 81% of these gardens due to hedgehog holes in fences being present. 71% of those without hedgehog holes had not considered hedgehogs would need access and only 5% of people would not be opening up their gardens to hedgehogs. As a snapshot of the attitudes towards hedgehogs in the area, this suggested that it is general ignorance towards the issues that hedgehogs face that impedes access to gardens, rather than a dislike of the animal or other intervening factors.

5. Conclusions

The HIA project was highly successful in directly engaging almost 15,000 people, with over 4,500 followers on social media and almost 1800 volunteer hours given. There are over now 2400 reported hedgehog sightings across Warwickshire that have been shared. More than 30 areas of greenspace were surveyed regularly over time by dedicated volunteers, and there are two

established hedgehog hub sites being monitored by a group of 35 trained legacy volunteers. Habitats were improved through on-the-ground volunteering, land management changes across greenspaces, and planning guidance to encourage hedgehog-friendly development. Partnerships with local authorities, charities and community groups were essential for the project to be successful and sharing that success with others will help drive hedgehog conservation in the future.

6. References

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