Three years of the *Hedgehog Hibernation Survey*

The internet, for all its frustrations and drawbacks, has revolutionised the monitoring of wildlife. The *Hibernation Survey* could not have happened twenty years ago. Now, after three years, we have collected almost 150,000 sightings of hedgehogs – one of the largest datasets in the world about hedgehog behaviour.

Thank you all so much for contributing to this, the level of public support we have received has been amazing and is another demonstration of the deep affection we Brits feel for our hedgehogs.

This report is a summary of what we have learnt, and an outline of where we go next.

Hibernation Survey 2014 – what happened?

2014 saw the highest levels of participation so far, with almost 30,000 forms submitted by 2,263 participants.

As in previous years, most (91%) of the hedgehog sightings submitted were seen in recorders own gardens, and most (94%) were (thankfully!) alive. Only a small number (=245) of the total were recorded as 'hibernating' – presumably these were animals in hedgehog houses or in nests that were known to the recorder.

It is important to know if animals are hibernating or not, as these may skew the trends seen in active hedgehogs if they are included in the analysis.

A total of 59,947 hedgehogs were reported during 2014 – however, as hedgehogs are hard to recognise unless they are marked in some way (or you know them *really* well), there are undoubtedly lots of repeat sightings within this tally. This is especially true in garden-based sightings, where the surveyor regularly puts out food.

Two thirds of participants in 2014 said that they regularly put food out for hedgehogs. Interestingly, of all the people that recorded hedgehogs in 2014, 91% of records were from people who said they regularly fed hedgehogs. This may be because the presence of food increases the likelihood of seeing hedgehogs, or it may be simply that those people who feed hedgehogs are more likely to be actively looking for spiny visitors in their local area.

In terms of overall trends in hedgehog behaviour, the picture is complex and it is helpful to discuss it in the context of the other two years' worth of data.

Hibernation Survey 2012-2014: main achievements

- Almost 5,000 people submitted ~150,000 hedgehog sightings.
- Phenological differences between regions do not appear to be clear, nor does the impact of climate change on patterns of emergence (Phenology concerns the timing of natural events).
- This is still only a snapshot, but it will provide an invaluable baseline for future studies.
- 'First hedgehog of the year' may be a useful way to monitor phenology going forward.
- The locations of the sightings have contributed to a new national distribution map with an unprecedented level of detail.

Is hedgehog activity and behaviour changing?

Differences between regions

One of the main motivations behind running this study was to re-examine a pattern observed by Dr Pat Morris in the 1960s: that Scottish hedgehogs became active later than those in southern England.

2014 UK rank	Top recorders ☺	Top counties for feeding hedgehogs	Top towns for recorders
1	Elizabeth George	Hampshire (87)	Cambridge (24)
2	William Parsons	Lancashire (63)	Southampton (23)
3	Denise Glover	Cambridgeshire (49)	Bury St Edmunds (22)
4	Rachel Cushing	Kent (49)	Norwich (17)
5	Geoffrey Fairhurst	Cheshire (48)	Bristol (16)
6	Becky Walton	Suffolk (48)	Bedford (16)
7	Frances Sowerbutts	Devon (47)	Birmingham (16)
8	Louise Guest	Oxfordshire (47)	Nottingham (14)
9	Kerri Culver	Lincolnshire (46)	Oxford (13)
10	Pauline Austin	Norfolk (45)	Coventry (12)

Table 1: 2014 survey stats

Julie Wilkinson, Hedgehog Street

Changes in phenology can affect populations of wild animals because they might alter the availability of food or the ability of the animal to cope with changing environmental conditions.

In three years of recording, these regional differences have not been apparent and it is unclear why this is so.

Differences between the 1960s and 2012-2014

Another key question was to see if patterns of hedgehog behaviour had changed in the fifty-odd years since the first survey. The climate in Britain has been warming, so perhaps this has affected when most hedgehogs 'wake up'?

Comparing the data from 1966 with that of 2012, 2013 and 2014, we have found no significant difference in emergence timings, suggesting that climate change is yet to be having a measurable impact on this aspect of hedgehog behaviour.

The first hedgehog of the year

During 2013 and 2014 we asked you to tell us if any particular record was your first hedgehog sighting of the year.

We are now cautiously optimistic that this information would be enough to monitor the timing of hedgehog emergence across the country, with the advantage that it is much less labour intensive than recording all sightings.

This statistic is used to monitor the phenology of several North American species, including ground squirrels, American robins, tree swallows and yellow-bellied marmots. This is the first time this technique has been considered for hedgehogs.

Getting to grips with the hedgehog year

Three years of the *Hedgehog Hibernation Survey* has added colour to our understanding of the timings of important events during the average hedgehog's life.

One aspect of this is risk. Hedgehogs are notoriously poor road crossers, and we can probably assume that the majority of dead hedgehogs recorded in the survey are from traffic accidents.

We would expect the two periods of highest mortality to be 1: When males are hyperactively searching for females during the peak rutting season in May and 2:The first flush of inexperienced juveniles dispersing from the nest. The *Hibernation Survey* appears to have confirmed this (see **Fig. 2**).

Where are all the hedgehogs?

One of the great advances brought about by the survey, and a rather unexpected one, is that all of these records have hugely improved our understanding of exactly where hedgehogs can be found in the UK.

We have combined the location data from the survey with the past five years' of data from four other surveys to produce the most up to date distribution map for the hedgehog available (see **Map 2**).

And you are the first people to have seen it! With hedgehog populations in rapid decline, it is crucial we continually update our distribution

Christine Foster

Sheena Ballard

Mark Simmonds

maps to show where hedgehogs are still present.

What next? A national network of garden monitoring sites

'Take the best that exists and make it better" - Sir Henry Royce

The *Hibernation Survey* has been a fantastic citizen science project. It has had its limitations though, which is understandable for a survey designed to answer a specific question. One of these was that it wasn't ideally suited to those people who see lots and lots of hedgehogs in their gardens, week after week.

We know that the majority of hibernation survey participants feed their hedgehogs, and have animals regularly visiting their garden. To make the best use of this we plan to establish a network of garden-based hedgehog monitoring sites from which we can start to investigate other key issues affecting our hedgehogs.

For example, what is the national population size? Why are hedgehogs attracted into my garden? Do my security lights affect them? Do my dogs put them off?

These are the type of questions we shall hopefully be able to investigate in 2016.

Thank you once again for all your efforts - I will be in touch.

Best wishes

Henry Johnson
Hedgehog Officer
PTES and
on behalf of BHPS

UK rank (2012-2014)	Name	Location	Records submitted
1	Elizabeth	Norfolk	885
2	Pauline Austin	Blunsdon, Wiltshire	880
3	Frances Sowerbutts	Accrington, Lancashire	598
4	Geoffrey Fairhurst	Bedford, Bedfordshire	569
5	Gareth	Devon	567
6	William	Devon	545
7=	Marion Webb	Staplehurst, Kent	532
7=	Denise Glover	Nuthall, Nottinghamshire	532
9	Louise Guest	Coventry, West Midlands	517
10	Jean Nichols	Wallingford, Oxfordshire	509
11	Kerri Culver	Aylesford, Kent	498
12=	Kim Baldwin	Lichfield, Staffordshire	489
12=	Terry	Bedfordshire	489
14	Norma Boyle	Wenhston, Suffolk	451
15	Diane Bevan	Coventry, West Midlands	447
16	Liz Bateman	Allington, Lincolnshire	446
17	Robert Green	Ipswich, Suffolk	421
18	Jill Monnox	Fareham, Hampshire	417
19	Annie Tyrell	Yelverton, Devon	414
20	Jean	North Yorkshire	407

Glenn Winchester

Brian Smith

Table 2: Over the three years a total of 4,778 people contributed at least one hedgehog sighting to the survey. The top contributors are listed above – a special thank you goes to these people for committing so much time entering records on the somewhat cumbersome forms!

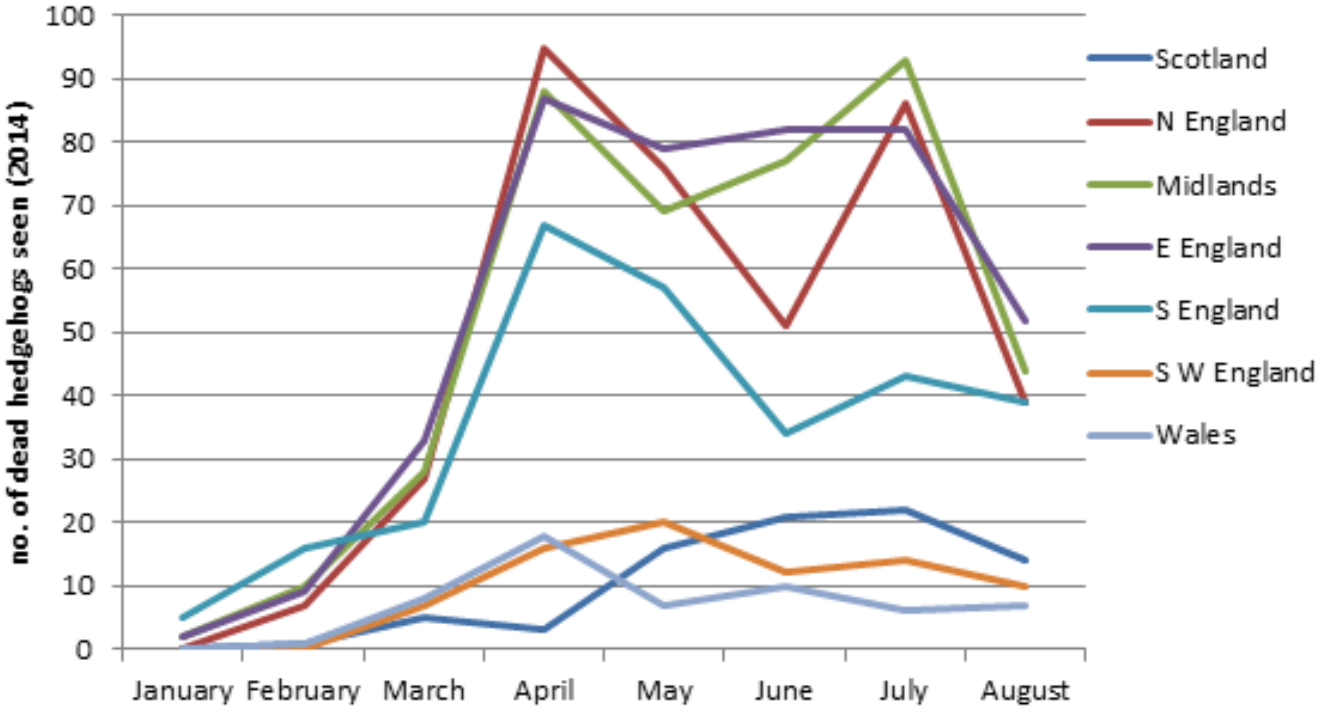


Fig 2: Dead hedgehog records through the year, with two distinct peaks visible.

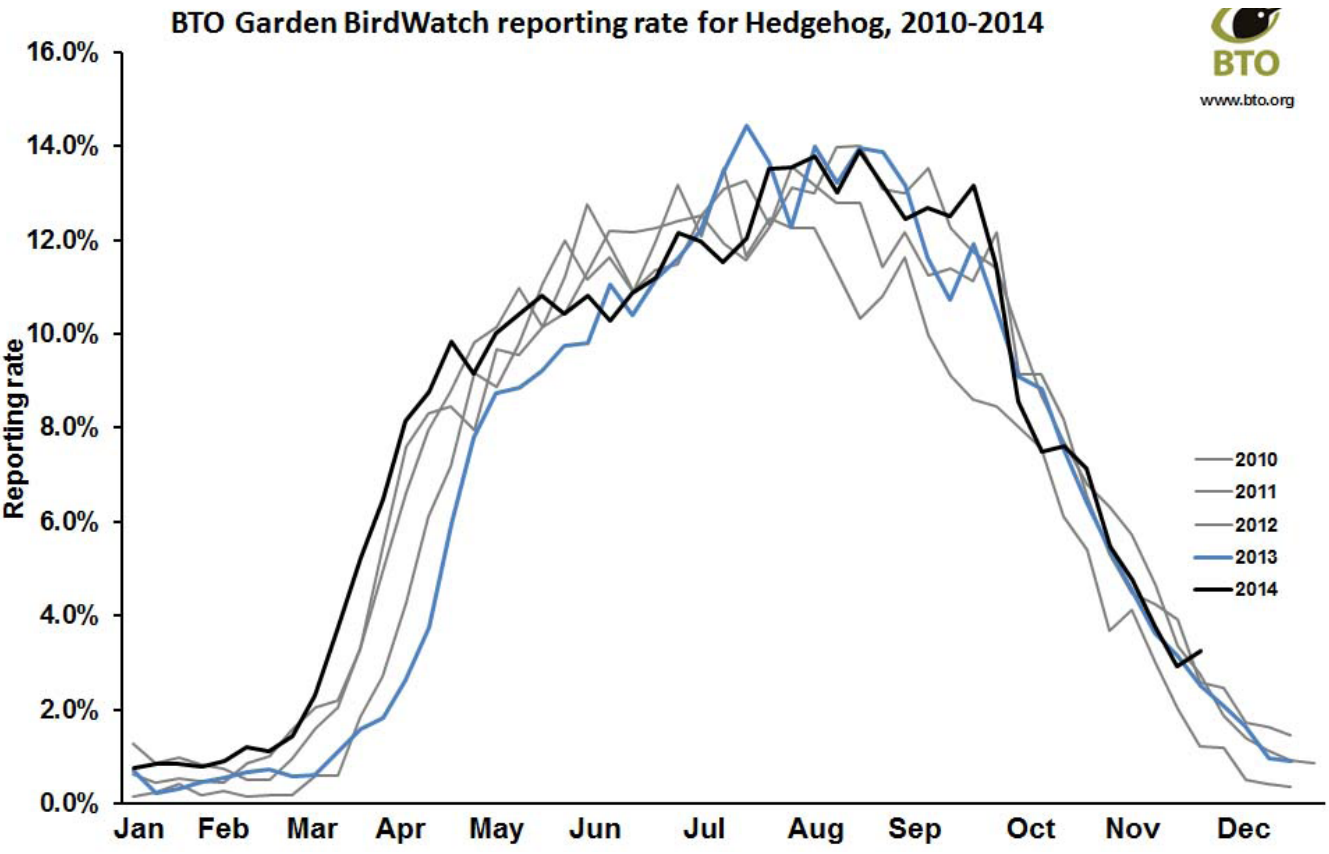
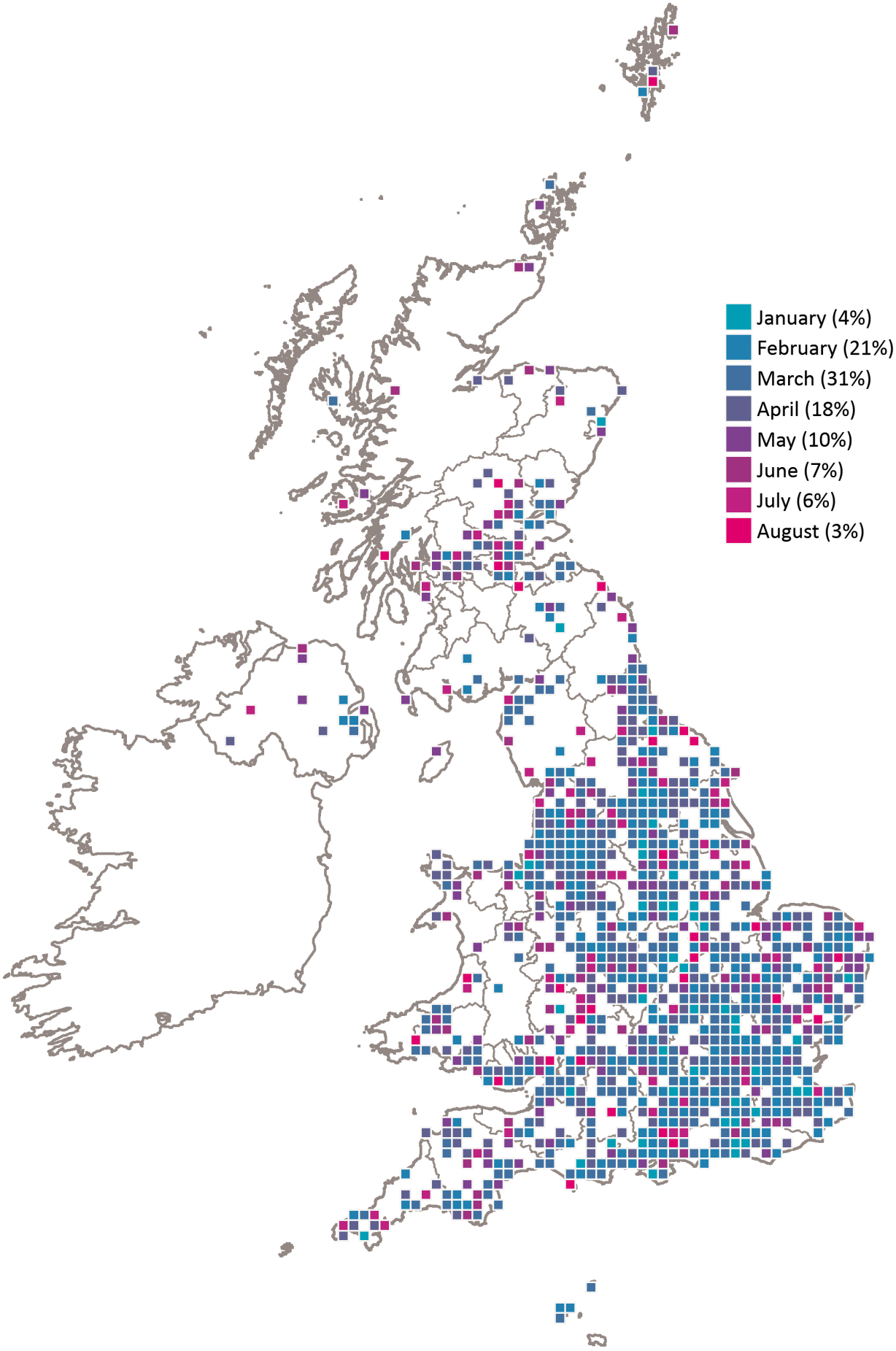
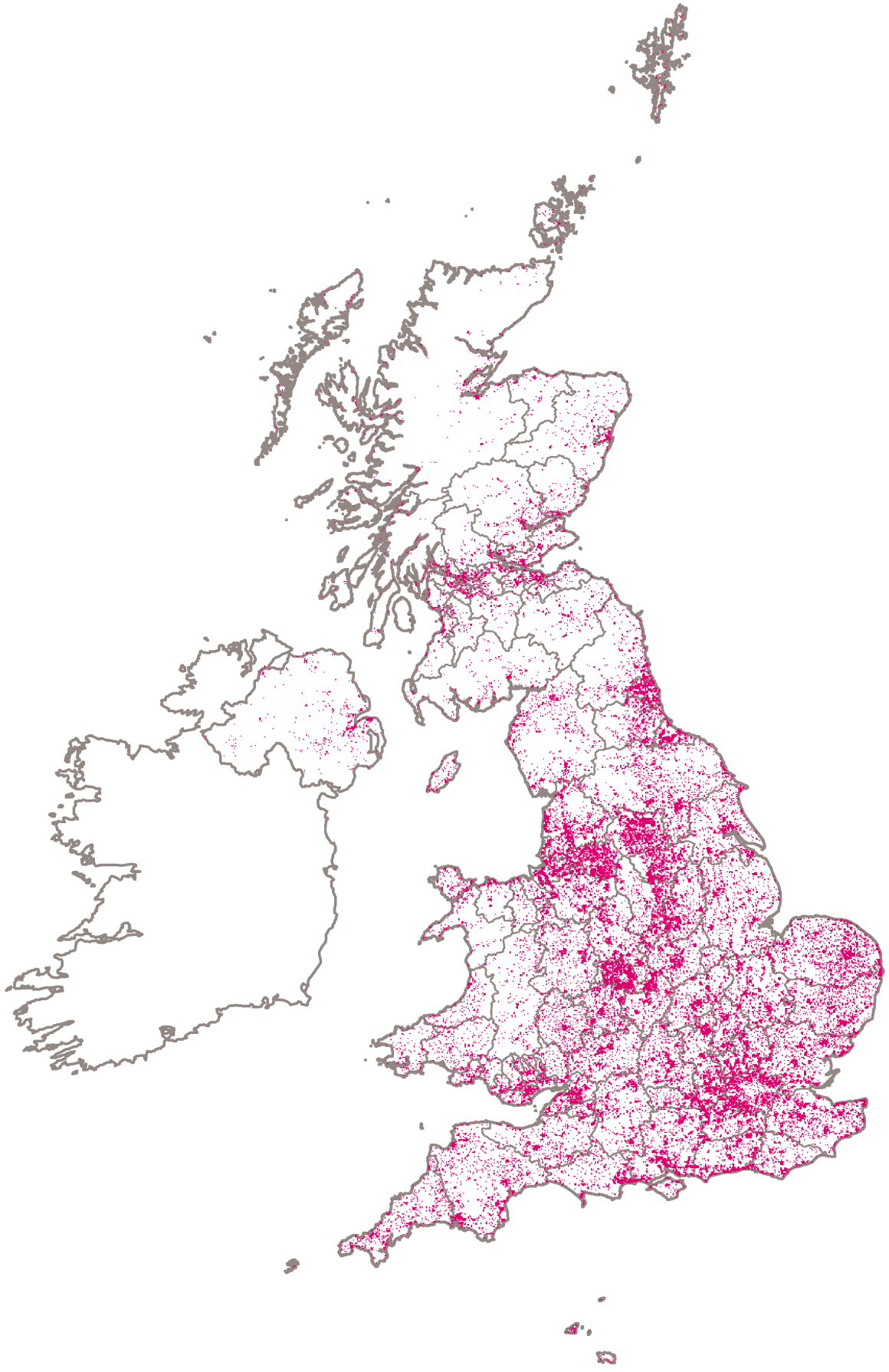


Fig. 3: A changing climate could theoretically affect British hedgehogs in a range of ways. One of the big uncertainties is to do with over-winter conditions, as variable winter weather is bad news for hibernators. The BTO has a fantastic network of around 13,000 volunteers who record the bird activity in their gardens. They also collect some information about non-bird species, including hedgehogs. This is one of the reasons for us changing what we do – so that we complement this work and do not replicate it.



Map 1: A plot of the earliest recorded hedgehog sighting in 2014 per 10km square. The pinker the square, the later the first sighting. You might expect the north to be pinker than the south but no apprarent pattern is visible in this year's data.



Map 2: The most up to date distribution map of hedgehogs in the UK. 1km^2 resolution. Each 1km^2 that is red indicates presence of hedgehog in one or more survey in the past five years. The distribution is heavily skewed by recorder effort i.e. where people live. Contains the BHPS'/PTES' *Hibernation Survey* (2012-14), PTES' *Mammals on Roads* (2010-present), PTES' *Living with Mammals* (2010-present), RSPB's *Make Your Nature Count* (2011) and RSPB's *Big Garden Birdwatch* (2014).