



What do we really know about dormice?

CONTENTS

- Why I started working with dormice
- Back to basics – what we think we know about dormice
- Research projects
- Conclusion

Kent Biodiversity Action Plan



A framework for the future of Kent's wildlife

1997

Habitat Action Plans HAPs

	Present	10 years	50 years
SSSI	?	All	All
SNCI	?	35%	75%
Ancient semi-natural woodland (20,839 ha)	?	25%	50%
Coppice (where historic management)	40%	50%	75%
Restore ancient replanted woodland (8,059 ha)	-	25%	50%



Species Action Plans SAPs

Dormouse (*Muscardinus avellanarius*)

Targets

	Present	10 Years	50 Years
Population	?	Survey of all ancient semi-natural woodland for dormice	25% increase
Nest boxes	?	100 boxes in each of 10 woods	100 boxes in 50 woods

Conversations
with cutters
All knew
dormice
summer &
winter nests

Why are dormice important?

- Classified as of **Least Concern** by the International Union for the Conservation of Nature (IUCN)
- UK Considered as **vulnerable** - individuals, their breeding sites and resting places, protected by law under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)
- **European Protected Species** under the Conservation of Habitats and Species Regulations 2010 (as amended).
- On Section 41 of the Natural Environment and Rural Communities Act 2006 (NERC) as '**Species of Principal Importance for the Conservation of Biodiversity**'. All public bodies must pay due regard to biodiversity conservation, restoration, and enhancement.
- Local authorities are also required to conserve and enhance biodiversity by the National Planning Policy Framework (NPPF).

Monmouthshire man prosecuted for destroying valuable wildlife habitat

2021

A luxury housing developer has been ordered to pay more than £100,000 for destroying land that housed rare Hazel Dormice, in a first of its kind prosecution for Hampshire.

<https://www.hampshire.police.uk/news/hampshire/news/news/2021/december/rare-dormouse-habitat-destroyed-by-luxury-housing-developer/>

17 Mar 2023



What do we know?

Nocturnal

Woodland and hedgerows

Active summer in the canopy

Eat insects, plant material

Make nests of plucked green leaves

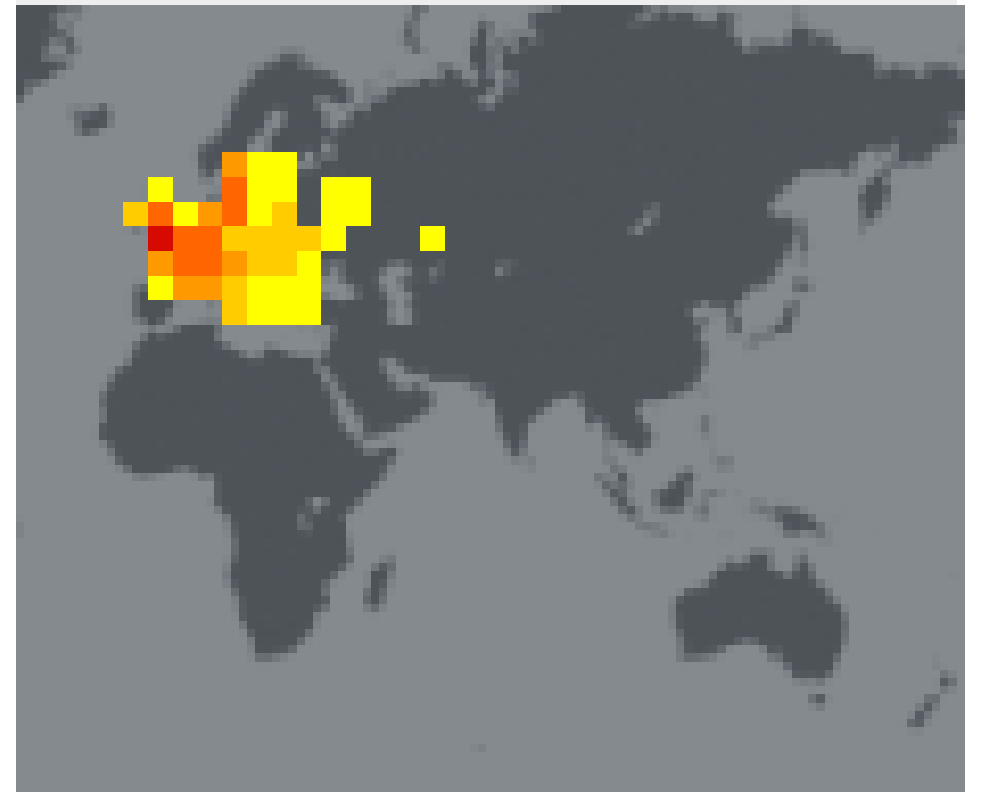
Rarely come down to the ground

Hibernate in winter

Long lived – perhaps more like squirrels than mice

Keystone species – if present implies good for others

Widely distributed



The State of Britain's Dormice 2023

people's trust for endangered species

David Wembridge, Ian White, Kate Proogard, Nida Al-Fulaij, Steve Langton

- ▶ Hazel dormice have undergone a long decline in Britain and monitoring of populations in established woodlands shows a continuing decrease in abundance. Between 2000 and 2022, the National Dormouse Monitoring Programme (NDMP) shows the population has fallen by 70 per cent.
- ▶ Dormice are locally extinct in 14 English counties within their historical range; in a further six they are known only from reintroduced populations.
- ▶ Under IUCN Red List criteria, dormice are currently assessed as 'Vulnerable' to extinction in Britain, but recent work suggests a higher risk classification of 'Endangered'.
- ▶ The NDMP collects data from hundreds of woodland sites, but monitoring in a greater diversity of habitats where dormice might be present is needed, using new as well as established monitoring techniques, to gain a more complete picture and ensure the future of hazel dormice in Britain.

In two hundred years, Britain has lost about half its natural wealth. Thirty-eight per cent of species have declined since the 1970s, and a quarter of native mammal species face extinction¹. One of these is the hazel dormouse, *Muscardinus avellanarius*.

At the start of the last century, native populations of hazel

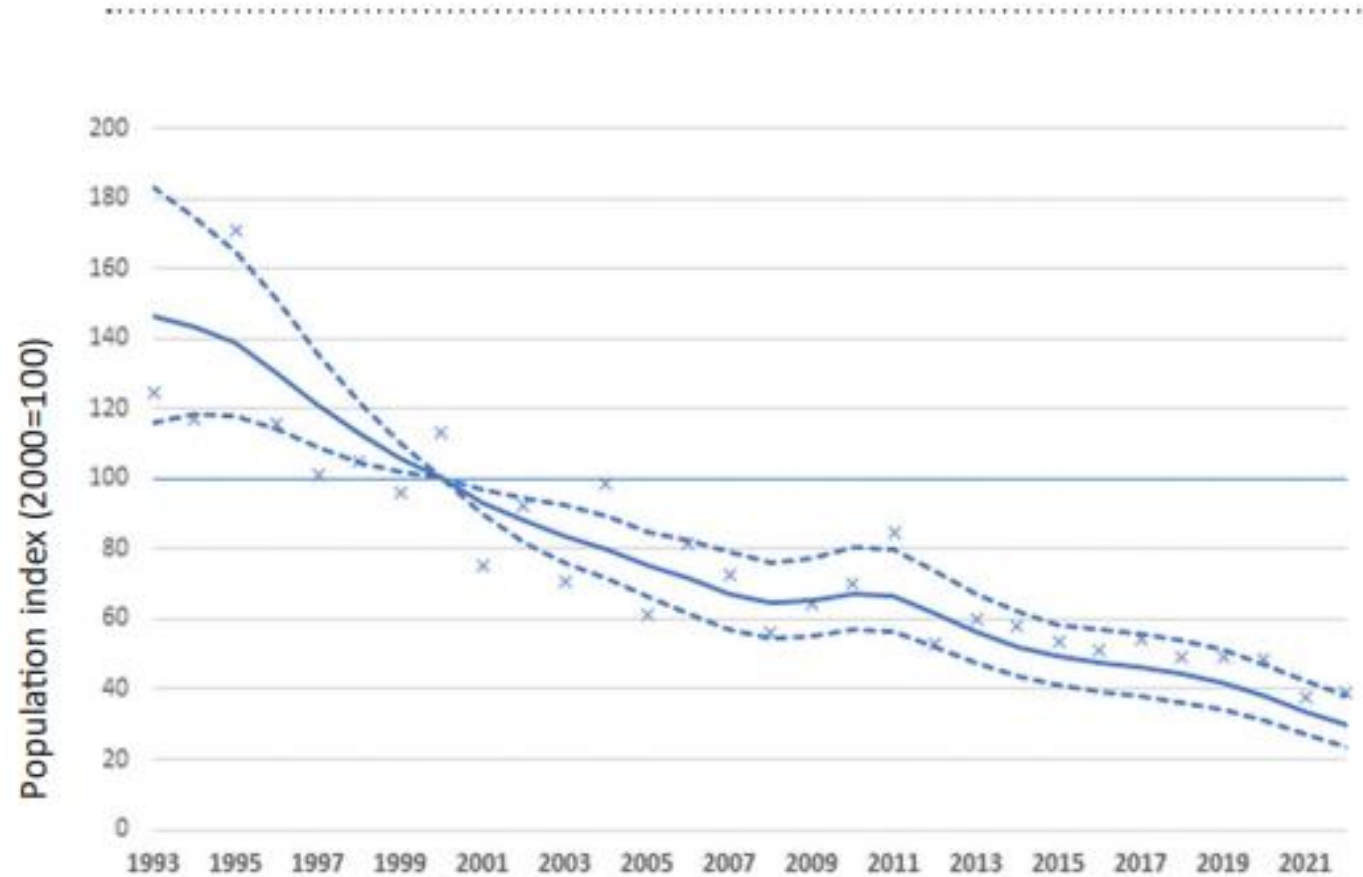
dormice were present in all but two counties in England and Wales: Norfolk, in the east of England, where records were of reintroduced animals, and Anglesey, in north Wales, where there were no records. In the following hundred years, native populations are thought to have become extinct in 20 English counties², based on the absence of records in the last 20 years.

in six of these, they have been reintroduced. In Wales, dormice retain much of their historic range. Other than a single native population in Cumbria, and reintroduced populations, the species is only found south of a line between Flintshire and Suffolk.

Before 1980, it's estimated that fewer than ten scientific papers



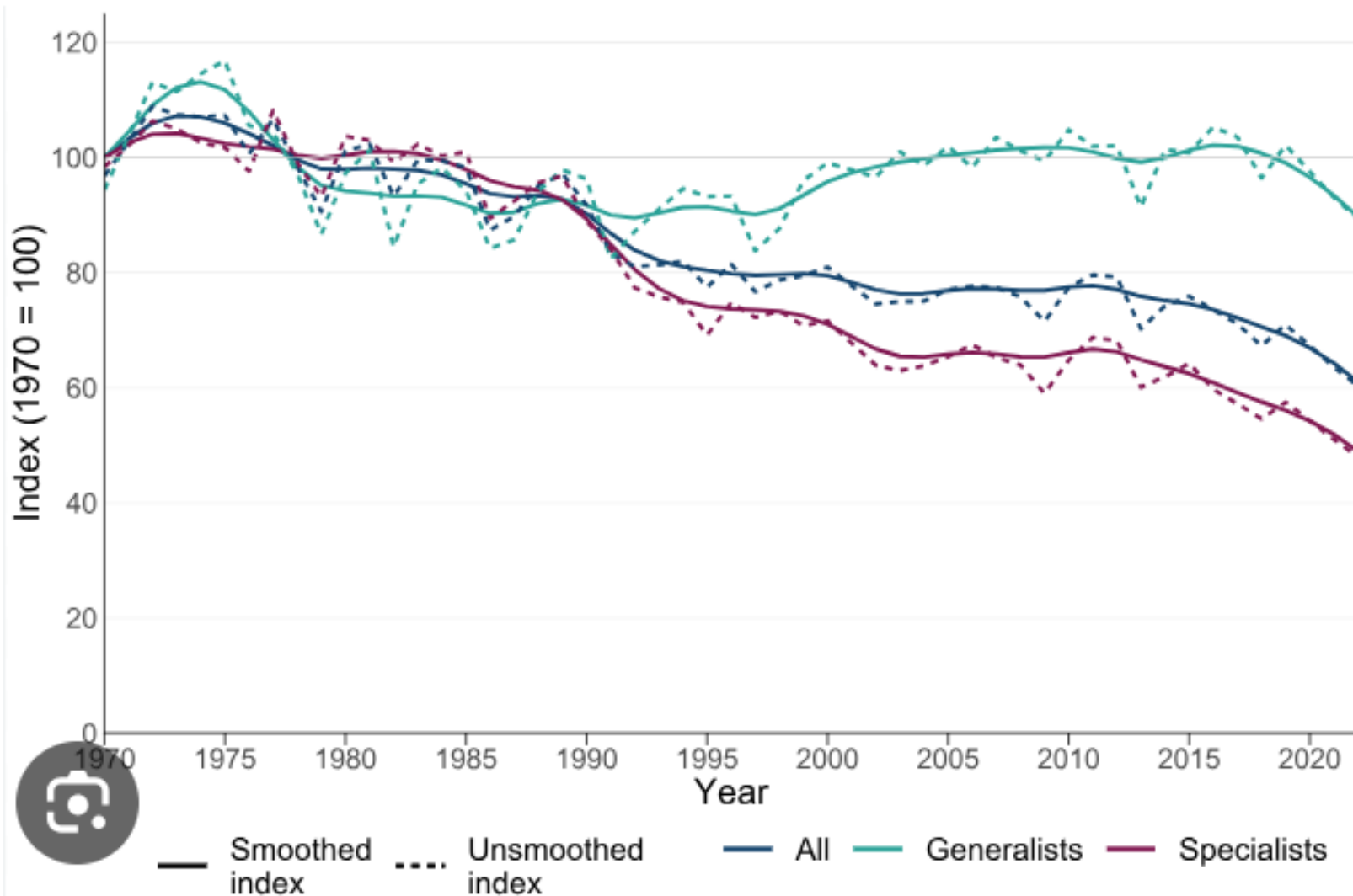
<https://peopletrust.wpenginepowered.com/wp-content/uploads/2023/11/State-of-Britains-Dormice-2023.pdf>



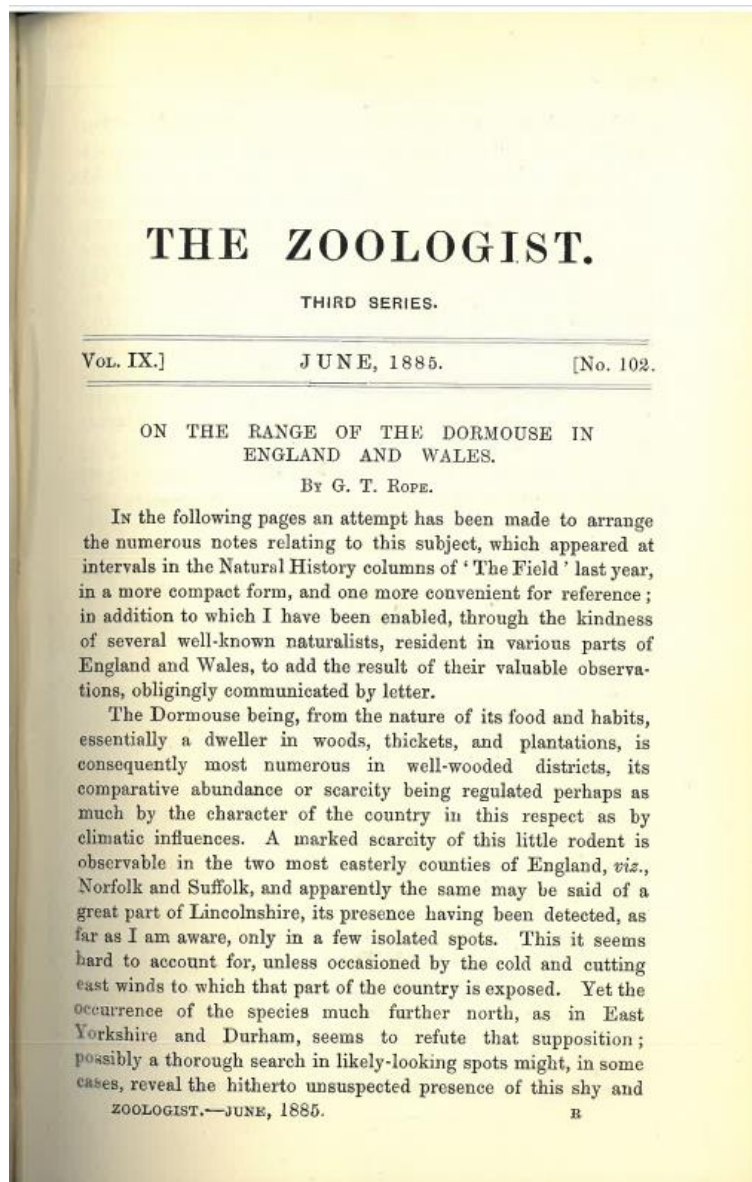
The population change recorded at NDMP sites between 1993 and 2022. The underlying trend, smoothing out fluctuations, is shown by the blue solid line and is calculated relative to the index in 2000, given a value of '100'. Statistical confidence limits are shown by the dashed lines (95% CI). Annual estimates (crosses) show the year-to-year variation around the smoothed trend.

To find a trend you need a baseline

<https://www.gov.uk/government/statistics/england-biodiversity-indicators/6-woodland-species>



Historical Records

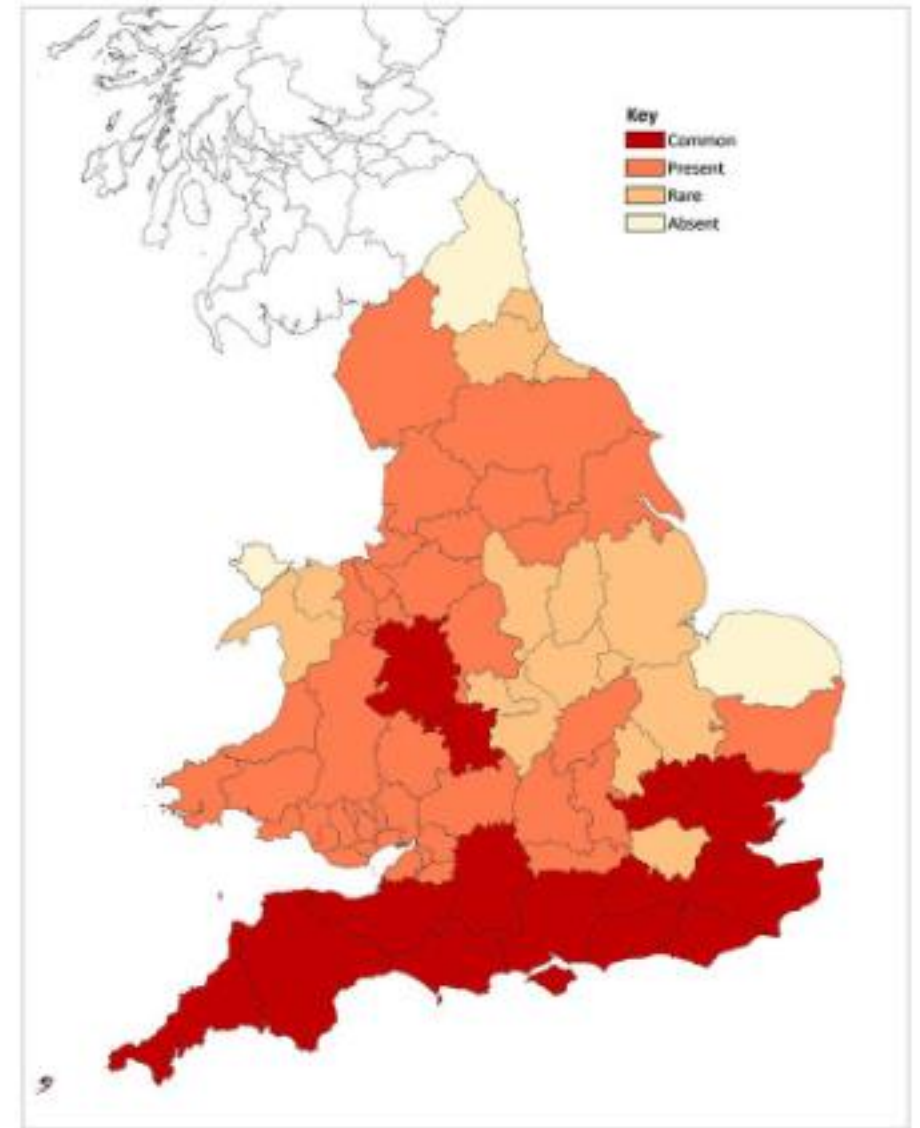


Rope G T
(1885)

On the range of the
dormouse in England
and Wales

The Zoologist 9(102)

Pages: 201-213



Victorian dormouse distribution in the UK

(Data from: Rope, G. T. (1885) On the range of the dormouse in England and Wales. The Zoologist, Vol 9, No. 102 pages 201-213) and Victorian County Histories)

Contains Ordnance Survey data © Crown copyright and database right 2018

people's
trust for
endangered
species

‘The Field,’ writes as follows:—“ Some fourteen or fifteen years ago I observed the Dormouse in the county of Durham, at Headlam, a small village about half-way between Darlington and Barnard Castle. For several days a pair of these little creatures had frequented a large peach-tree growing on a warm south wall in the Hall gardens, and eventually one of them was drowned in a bottle of beer and sugar which had been hung on the tree to catch the wasps, as the fruit was just ripening.

Another sad report is the author being shown a dormouse frozen to a piece of wood

But how reliable is Rope as a baseline?

This scanty and imperfect sketch can only be taken as giving some slight indication (a mere outline, as it were) of the distribution of this interesting little rodent in England and Wales: the lack of notes from many parts of England, such as Derbyshire, Rutlandshire, Northamptonshire, &c., may perhaps indicate a lack of observers rather than an entire absence of the species in question; and the same may be said of Wales, though doubtless many districts of that mountainous corner of our island would scarcely be adapted to its habits.

- Makes the comment that scarcity of reports may be because dormice are common (p 203)
- He also says *“The value of such communications would be greatly enhanced if accompanied by the name of the writer”*.

Lewis Carroll AKA Charles Dodgson 1832-1898



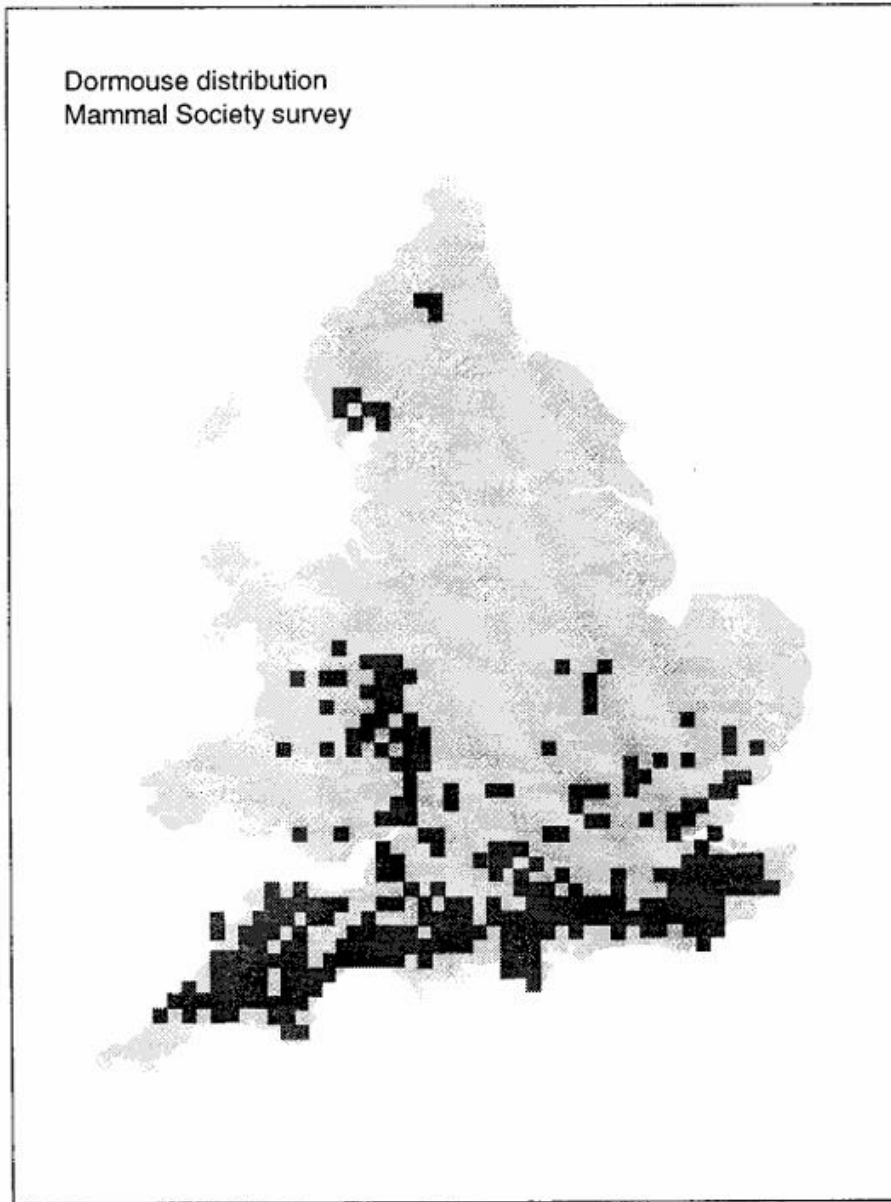


Fig. 1. Distribution of the Dormouse, as revealed by the Mammal Society Survey, 1975–79 (based mainly on finding characteristically gnawed Hazel nuts) after Hurrell & McIntosh (1984).

Where are dormice?

Mammal Society Dormouse Survey (Hurrell & McIntosh, 1984), more than **16% of the records were from hedgerows.**

Surveys in Kent & Somerset found evidence of dormice in many **species-rich hedgerows including those beside busy roads.**

Dormice have also occurred in **hedge row nestboxes** on the Isle of Wight and been trapped in this habitat in Herefordshire

(Bright & Morris 2008)

Small mammals have different dentition and tooth marks on hazel nuts can be used to distinguish them

<https://ptes.org/campaigns/dormice/surveying-and-monitoring-hazel-dormice/dormouse-nut-hunt/>

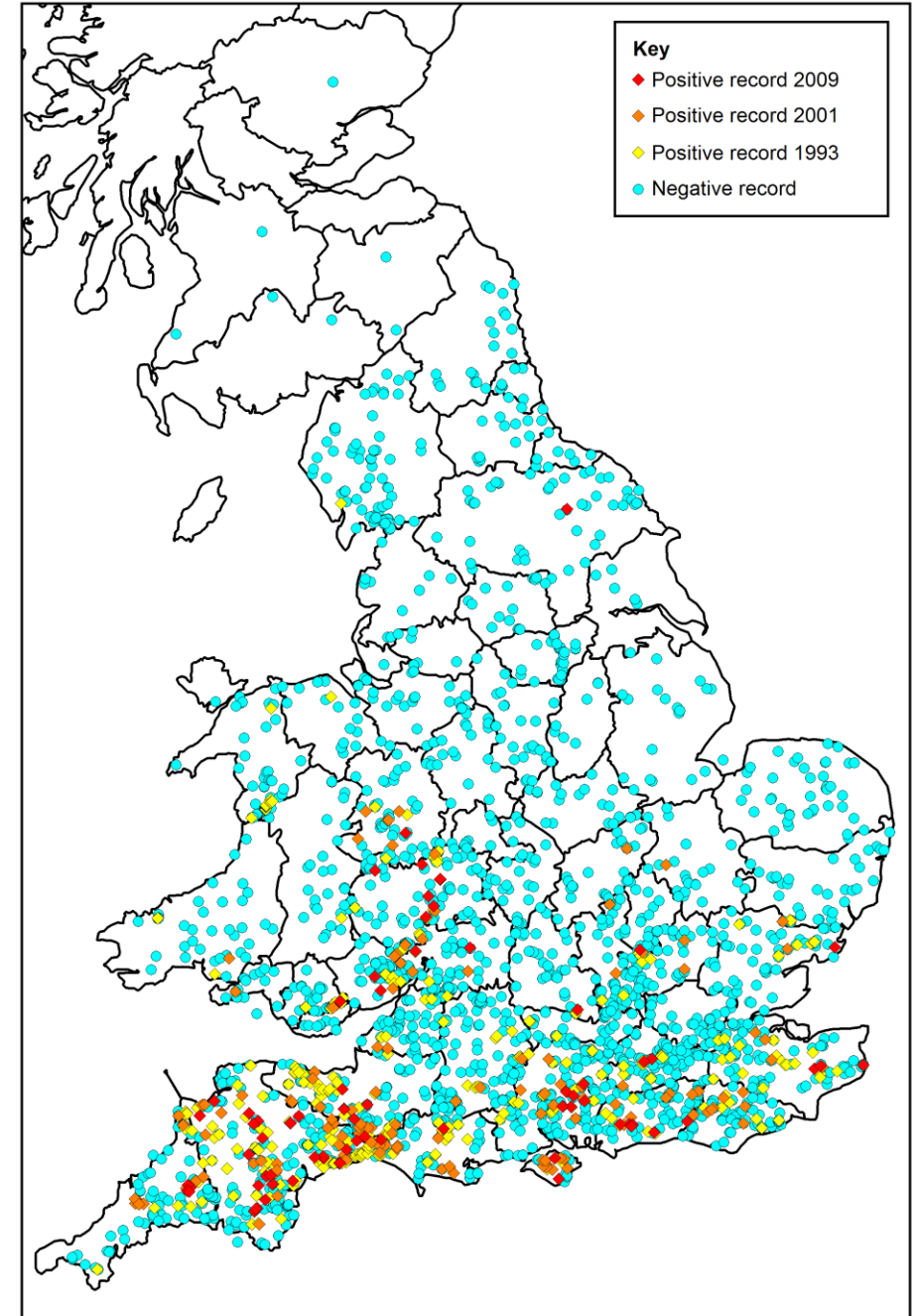


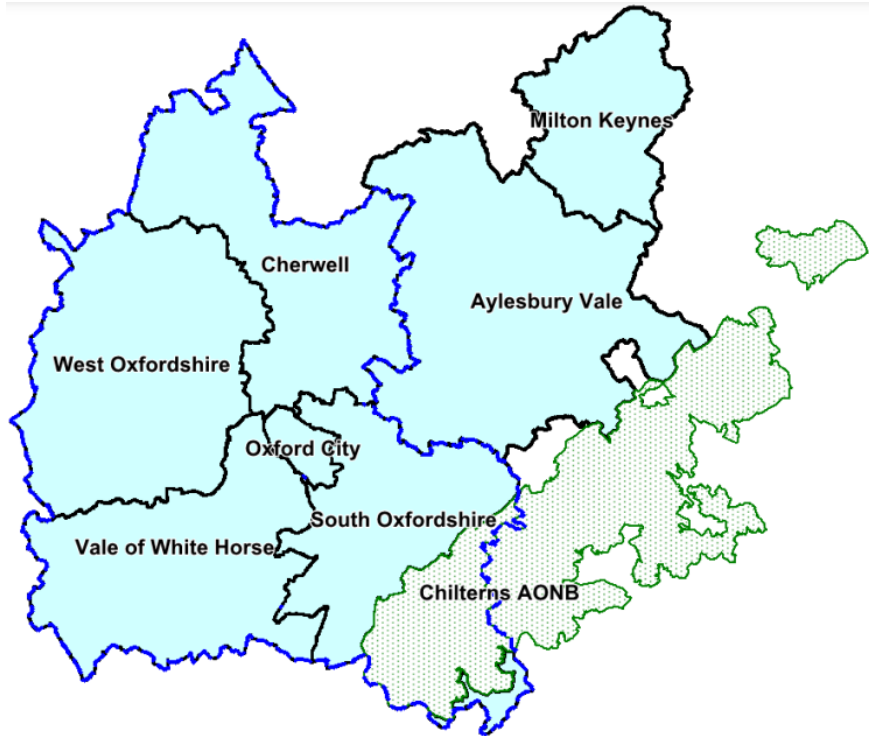
The Great Nut Hunt

1993 250,000 nuts found
13,000 were sent for verification
1,352 had been eaten by dormice
identified 334 new sites in 29 counties
(81 in Devon and 41 in Dorset).

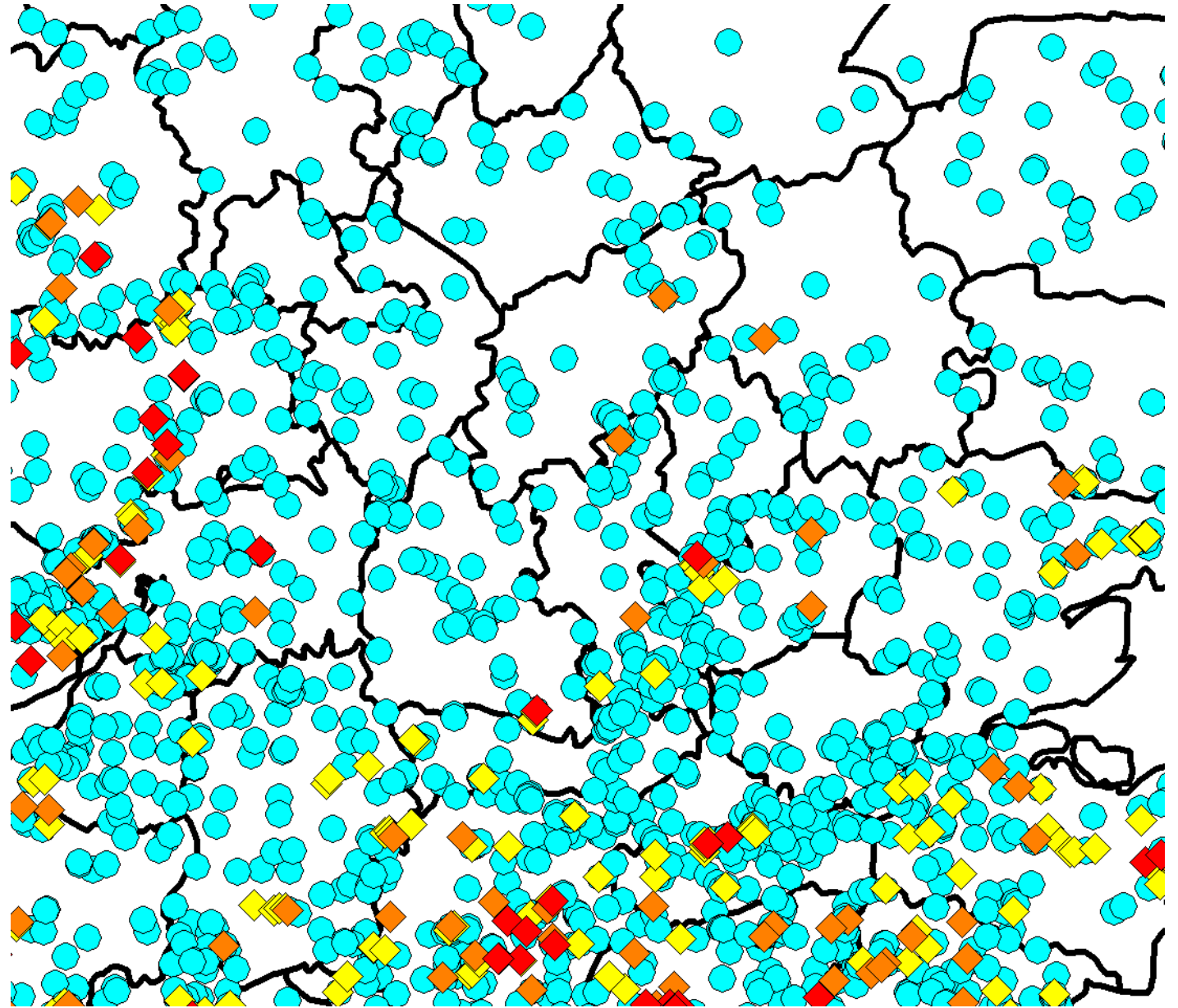
2001 repeat: 136 positive sites

Total known dormouse sites to > 800





A few sites in the very south of Oxfordshire were positive



National Dormouse Monitoring Programme NDMP

Set up in early 1990s

50 nest boxes placed on trees 1.4 metres from the ground

Checked by Natural England licence holder

Nests and/or dormice, recorded

Annual reports returned to PTES



Tubes and footprint tunnels



<https://www.nhbs.com/dormouse-nest-tube>



<https://www.wildcare.co.uk/10725-dormouse-footprint-tracking.html>

Welfare issues

Today we found a couple of VERY pregnant #dormice today at [REDACTED] with [REDACTED]. Weighing in at 30g, this female was really not feeling it today!



Hazel dormice becoming endangered in UK amid 70% decline, study says

Species now extinct in 20 counties in England due to loss of woodland scrub and milder winters



📷 A volunteer checks a hazel dormouse during the release of 20 breeding pairs or trios into woodland in Warwickshire. Photograph: Ben Birchall/PA

Populations of the hazel dormouse, perhaps the most elusive native British mammal, have plummeted by 70% this century.

NDMP data analysis

72% drop in nest box occupancy
1993- 2014
(Goodwin et al 2017)

78% decline over 27
years 1994–2020
(Scopes et al 2023)

Patrick Barkham

@patrick_barkham

Fri 10 Nov 2023 08:00 GMT

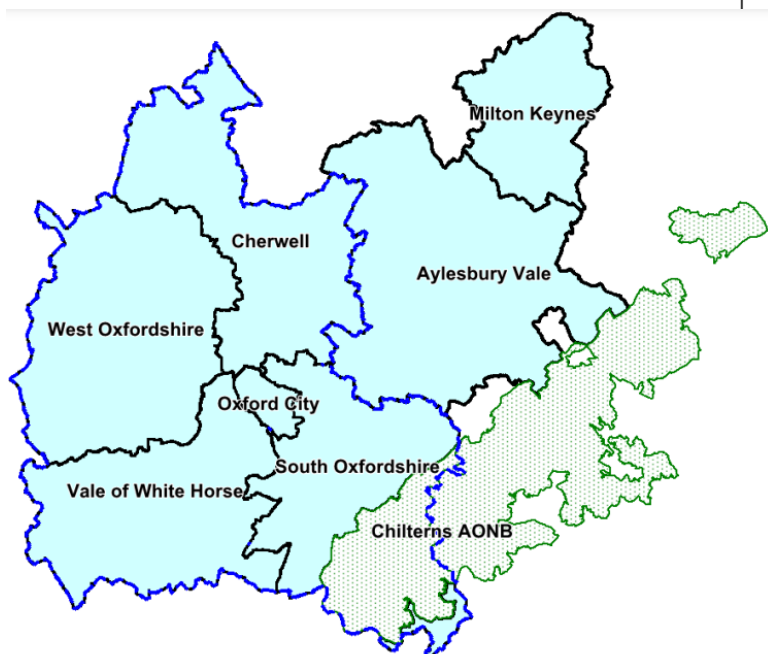


Dormice in Oxfordshire

In a letter which appeared in 'The Field' (April 19th, 1884), signed J. B. R., the writer, speaking of the habits of this animal in Oxfordshire, says—"They are found mostly in the vicinity of the parasite 'Old Man's Beard,' with which they line their nests before laying up for the winter. . . . They are fond of daisy seed."

In BERKSHIRE the Rev. H. A. Macpherson informs me that about Reading, according to Mr. Aplin, it is quite common; and in North OXFORDSHIRE he (Mr. Aplin) has had more than one report from good observers of its occurrence. Mr. John Worley, writing in 'The Field,' says "the Dormouse is to be found in the forest of Wychwood, Oxfordshire," and another correspondent, J. B. R., in 'The Field' of April 19th, 1884, writes:—"Dormice are not at all uncommon about Henley-on-Thames."

The National Forest Inventory (Forestry Commission, 2012) estimated that 9.9% of the total land area of England was woodland. The equivalent figure for Oxfordshire is similar at 8.9% (23,203 ha, as calculated using the National Forest Inventory).

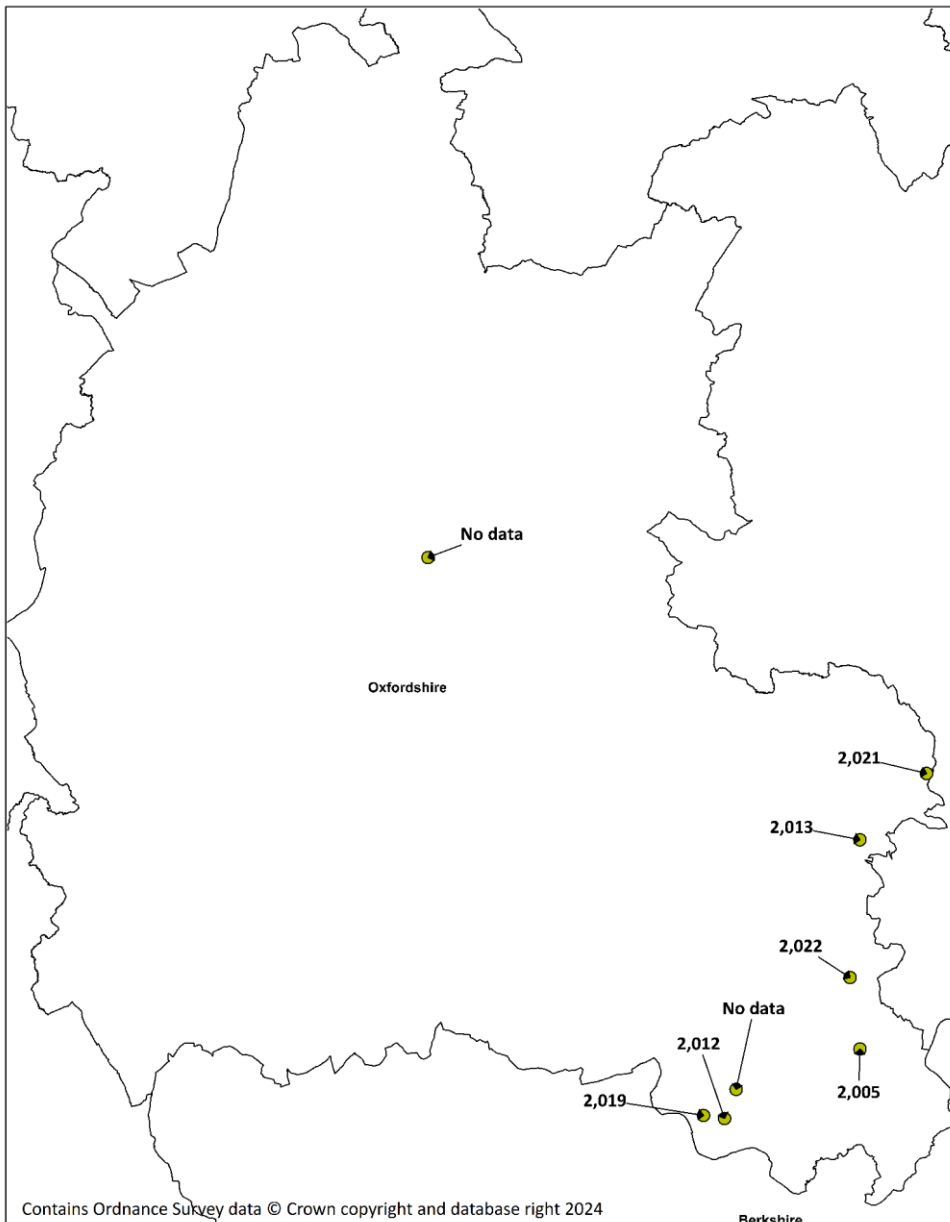


District	Area (ha)	All woodland		Ancient woodland ²		
		Area (ha) ¹	% of district area	Area (ha)	% of district's woodland	% of district area
Cherwell	58,700	2,952	5	381	13	0.6
West Oxfordshire	71,240	6,453	9	2,033	32	2.9
Oxford	4,546	250	6	0	0	0
Vale of White Horse	57,700	4,598	8	1,519	33	2.6
South Oxfordshire³	67,721	8,958	13	4,008	45	5.9
Oxfordshire (whole county)	259,907	23,203	9	7,940	34	3.1

Notes

- . Obtained from the National Forest Inventory, England (Forestry Commission, 2012), and excludes non-woodland categories
- . As recorded on AWI published 2013 (all areas except the Chilterns AONB in South Oxfordshire which is as recorded pre-2012 revision)
- . Data calculated from 2013 revision and 2012 revision of the Chilterns AONB area within the District

Table 1.1 Current ancient woodland in Oxfordshire



NDMP sites on Oxfordshire

2 have never submitted data

3 never reported dormice

1 only nests

2 reported dormice

National Dormouse Monitoring Programme (NDMP)
sites in Oxfordshire, showing when data was last
submitted to PTES

people's
trust for
endangered
species

Dalton Barracks Abingdon



But

IF dormice are arboreal living in the canopy
and they rarely come to the ground

WHY are we monitoring them using artificial
nest boxes/tubes at 1.4m from the ground?



RESEARCH

PROJECTS





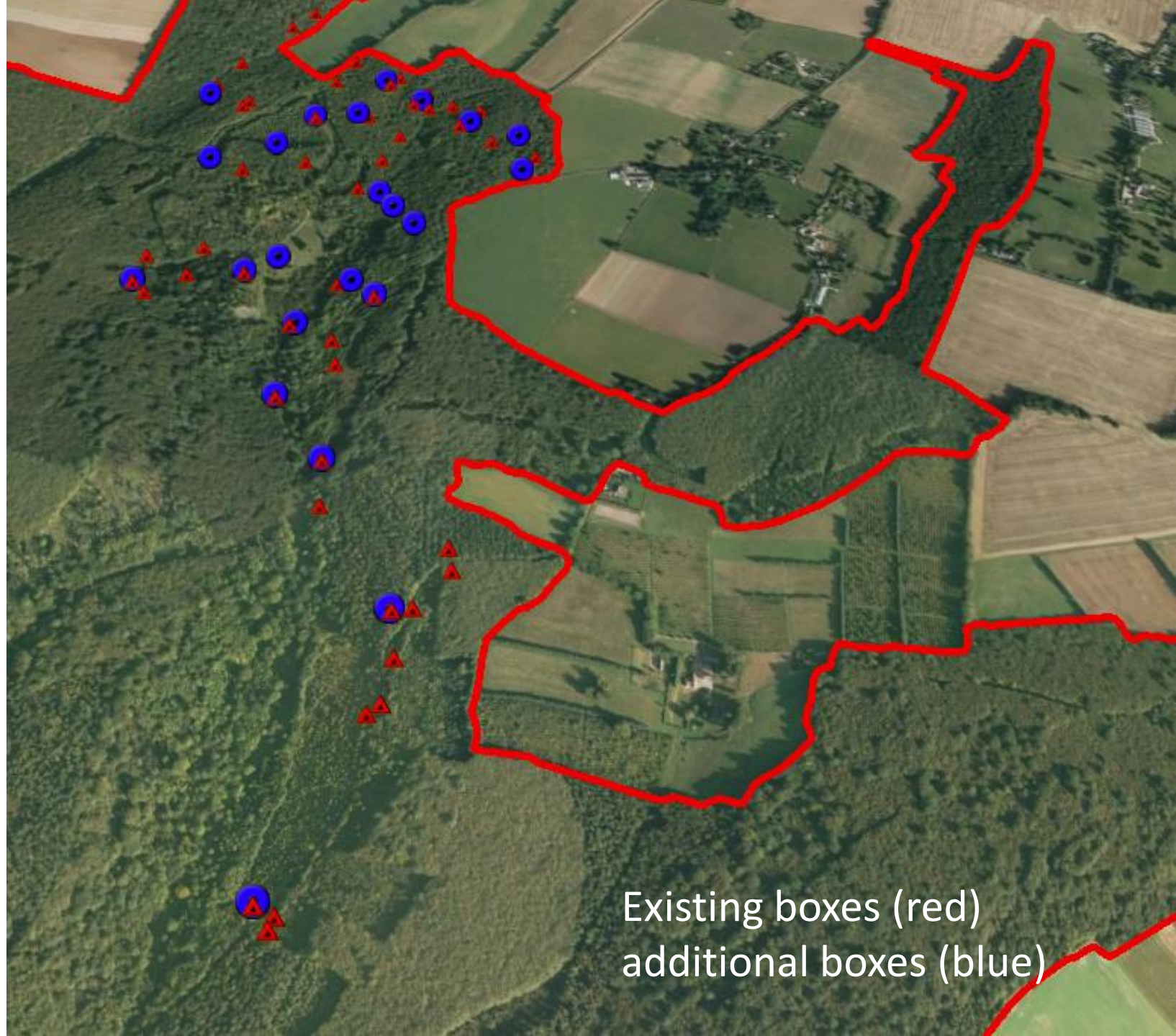
Denge study

49 boxes on 23 trees

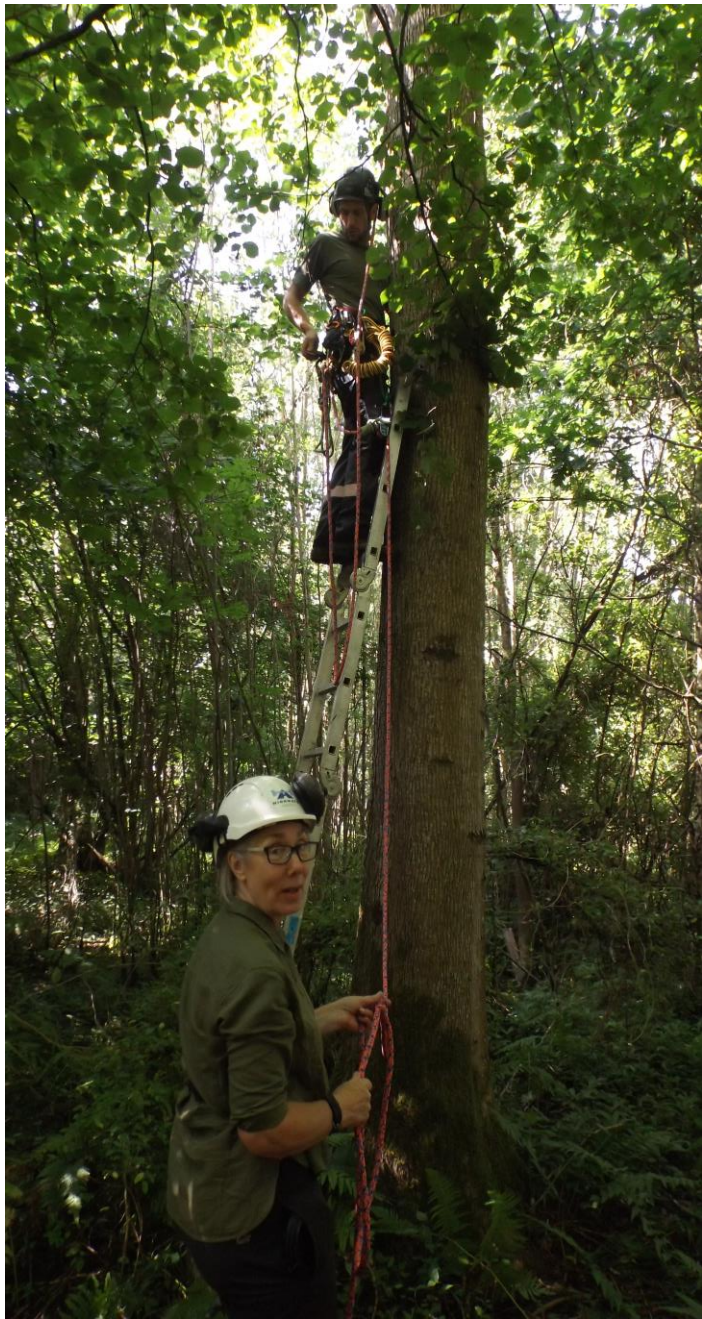
23 1.4m above ground

paired with higher boxes,
between 3 and 14m.

Some trees had an
additional mid-height
box.



Existing boxes (red)
additional boxes (blue)



Year	Position	Box																							Total
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI	XXII	XXIII	
2012	high																							5	
	low																							3	
2013	high																							8	
	low																							7	
2014	high																							7	
	low																							11	

Dormice found in 20 high boxes and 21 low ones.

In 8 cases both the high and low boxes were used in the same year

Where were nests before we put up boxes?

Where do the brown leaves come from?

Does reduction in box occupancy = decline?

How often do dormice come to the ground?

Was occupancy influenced by existing boxes nearby?

How effective is current 'good/best practice' survey methods in determining presence/likely absence?

More questions than answers!

How often do dormice come to the ground?



Experiment

Picked green leaves

Placed in dormouse box

Observed monthly

They don't go brown



SISSINGHURST STUDY

- RQ1 to establish to extent to which dormice, considered to be mainly arboreal during the active season, will use artificial nest boxes at standard height, higher in the canopy or placed in isolation on a post so they can only be accessed from the ground .
- RQ2 was to explore the anecdotally reported trend that artificial nest boxes are more frequently used when newly erected with occupancy tending to decline in subsequent years. If this is the case, then the apparent decline in dormice in the long-term monitoring scheme may be a function of survey method rather than population.

3 boxes

H= high box,

S= Standard

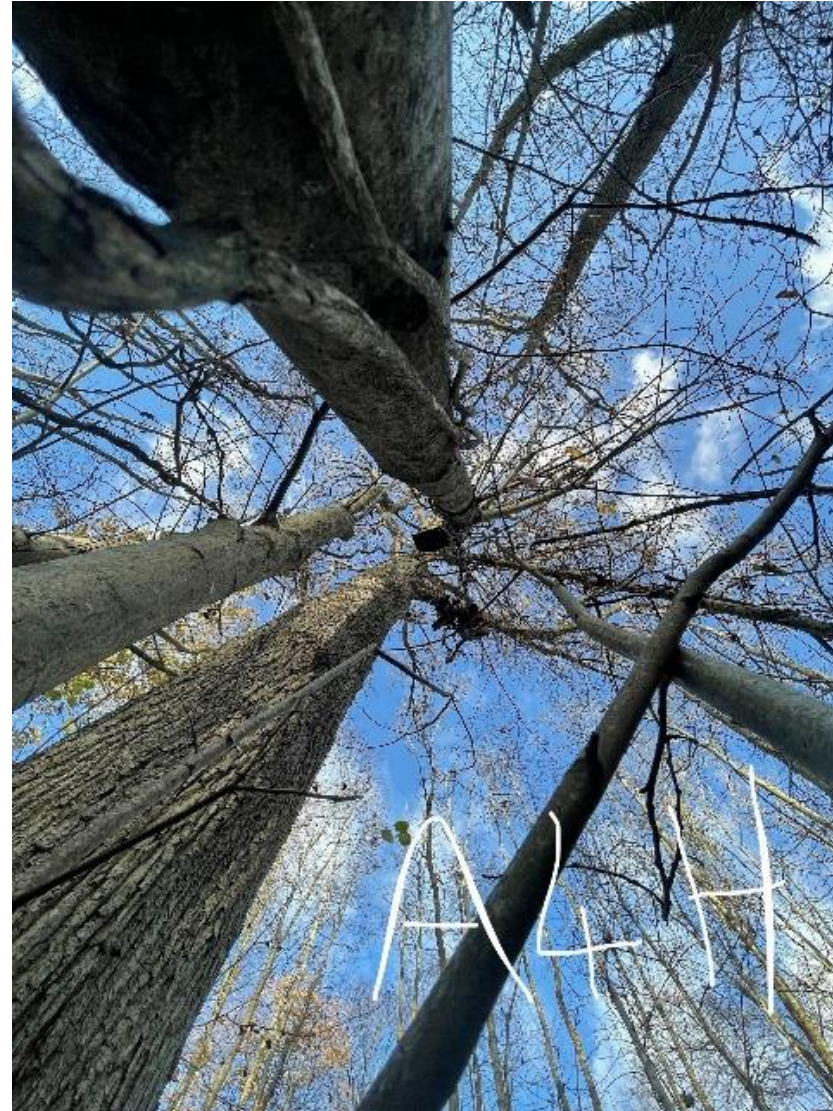
1.4 m

P= box on

post



Climbable trees with arboreal connectivity





Dormice and nests observed (does not = equal number of individual dormice)

	2017	2018	2019	2022	Overall total
HIGH BOX					
Dormice	4	8	4	1	17
Nests	3	9	2	4	18
STANDARD BOX					
Dormice	0	4	3	1	8
Nests	4	14	4	2	24
POST BOX					
Dormice	1	10	0	0	11
Nests	0	9	8	1	18
ANNUAL TOTALS					
Dormice	5	22	7	2	36
Nests	7	32	14	7	60

What does this mean?

- Total evidence of use: high 35; standard 32; post 29
- Dormice definitively come to the ground
- Boxes at standard height may well miss dormice
- There seems to be a tail off in use over 5 years

Does reduction in box occupancy = decline?

- The dormice were there before artificial boxes were put up
- Novel – curiosity factor
- Assessing trees for nest potential - difficult
- Restricting use by birds
- Is it due to parasite loading?

So why does it matter?

Accurate determination of whether dormice are present on a site has ecological, legal, and practical significance.

Bullion and Looser (2022) have questioned current survey methods in dense woodland with evidence of high risk of false negatives.

Are we monitoring the right habitat?

A protocol for use in 'unusual' habitats such as heathland was given by Chanin and Woods (2003)

On the basis of previous studies of the common dormouse *Muscardinus avellanarius* concentrated on deciduous woodlands in the southern counties of Great Britain, it was stated that optimal habitat for *M. avellanarius* should contain a high diversity of suitable shrub and tree species to provide continuous food supply through activity season and appropriate physical structure. However, both the present review of *M. avellanarius* habitats within its distributional range and recent dormouse studies in other parts of Great Britain indicate that *M. avellanarius* actually inhabits a much wider variety of habitats, and do not require specialised habitats as previously supposed. Juškaitis (2007)

So how can we
do better?

Can we use
dogs to
determine
presence/likely
absence?





<https://pawsforconservation.co.uk/>

Dogs have consistently demonstrated superior accuracy, efficiency, and effectiveness in locating bat and small bird carcasses compared to traditional human visual survey methods.

Our highly trained detection dogs excel in this specialised task, confidently detecting various parts of bat and bird carcasses, including wing(s) only, skeletal remains, and feather spots.

Can operational bat carcass detection dogs find freeze dried bats?

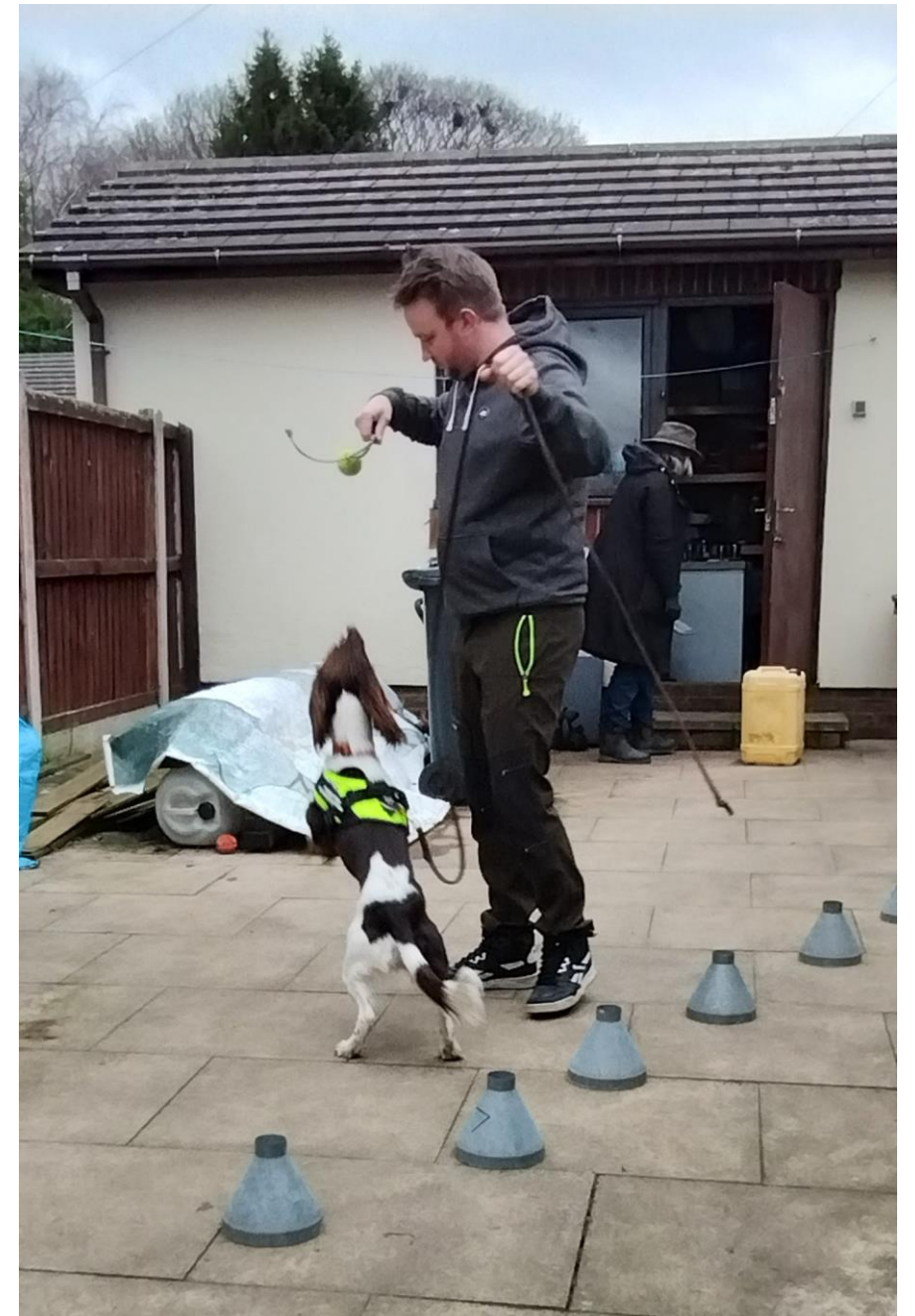


Moving on to dormice





Imprinting and discrimination



The captive breeding collection controlled conditions



Field work this winter



>270 PIT
tagged
dormice



So where are we now?

RESEARCH QUESTION	TIME PERIOD	COMPLETED
Proof of concept: can operational bat carcasses detection dogs find dried bats of various species?	Late 2019/early 2020	YES
Can dogs discriminate between freeze dried dormice and other <u>freeze dried</u> small mammals under training conditions?	Ongoing 2022	YES
Can dogs trained on freeze dried dormice detect live animals?	January 2023	YES
Can dogs trained on freeze dried dormice detect live animals and discriminate between these and other live small mammals?	January 2023	YES
Can dogs trained on freeze dried dormice detect hibernating dormice? <ul style="list-style-type: none"> • In controlled conditions? • In woodland known to have an active dormouse <u>population</u>? 	January 2023 Ongoing	YES



British Ecologists

19 h ·

Hi Folks, I'm looking for a reference that says dormice don't food cache. Is there a specific book or paper that says it outright?

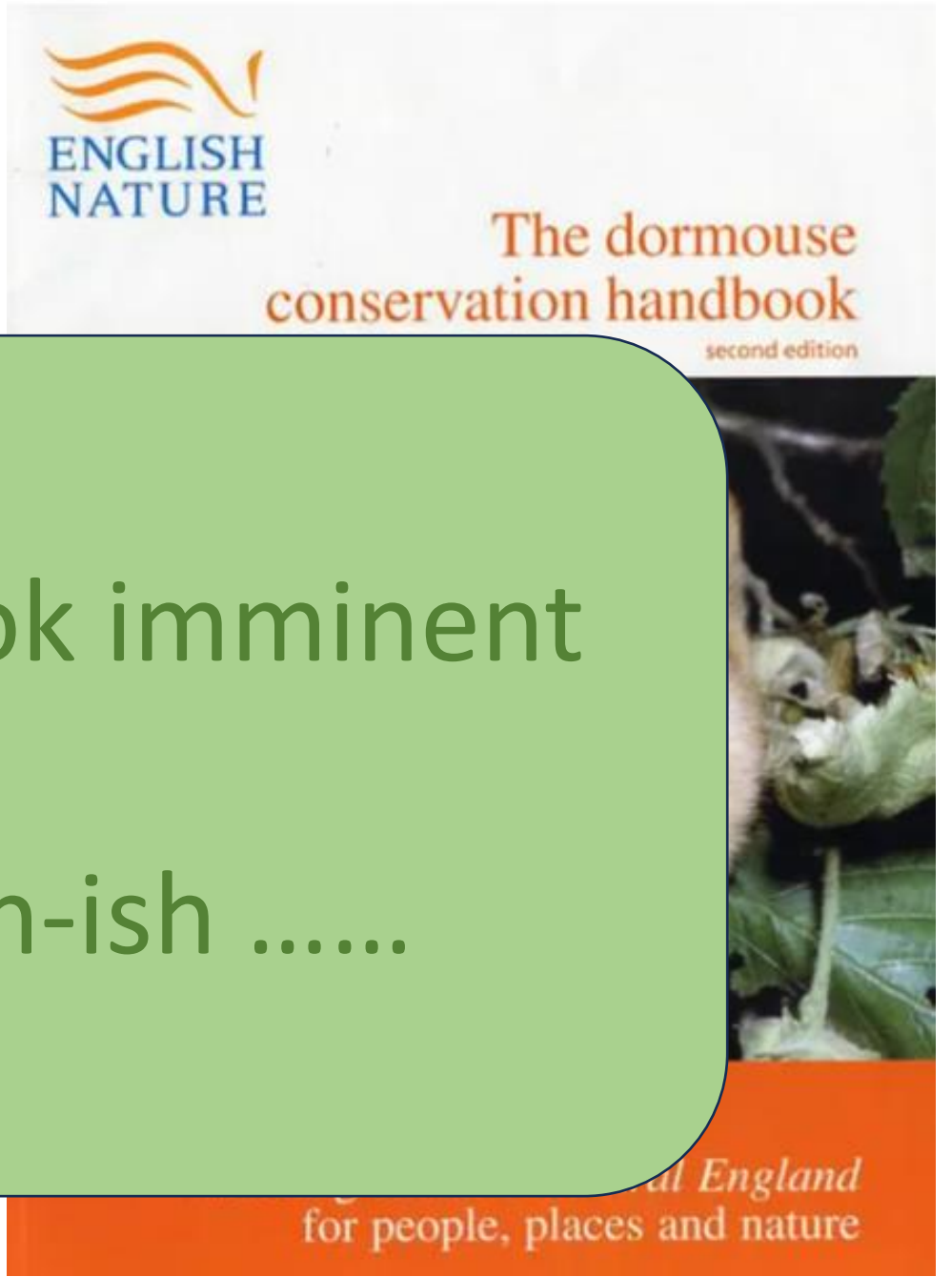
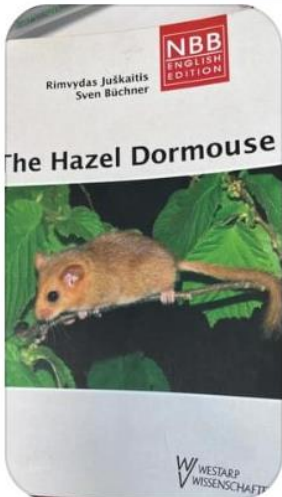


Dormouse Conservation
voles often collect nuts
There may be more
never heard that they

19 h Like Reply



This book states that
Likhachev 1971 who
food supplies.



New Handbook imminent
This month-ish

England
for people, places and nature

So what do we know about dormice?

**What is the best conservation
strategy to benefit dormice?**

Climate crisis

Climate crisis: 2023 was UK's second-hottest year on record

Such a warm year would have occurred once in 500 years without global heating, Met Office scientists say



Damian Carrington
Environment editor

@dpcarrington
Tue 2 Jan 2024 15:32 GMT



Health and climate
Climate crisis

Climate crisis could cause 10,000 extra UK deaths a year by 2050, says health body

A report by the UK Health Security Agency warns that extreme heat could bring a host of tropical diseases transmitted by insects



Supported by
the guardian
.org

February breaks temperature records for the 9th month in a row: Why has this winter been so warm?

The heat peaked in June and September, both record hot months in a series dating back to 1884. Photograph: Mike Kemp/In Pictures/Getty Images

[Climate crisis: 2023 was UK's second-hottest year on record | Climate crisis | The Guardian](#)

by the 2050s as a result of extreme heat and bring a host of tropical diseases, a stark report has warned.

[Climate crisis could cause 10,000 extra UK deaths a year by 2050, says health body | Climate crisis | The Guardian](#)

Responding to uncertainty

William Blake once said,

“in the universe, there are things that are known, and things that are unknown, and in between them, there are doors.”



Meeting the Challenges of Evidence-based Ecological Consultancy

Recommending and implementing practices to mitigate and compensate for the impacts of development on biodiversity are the bread and butter of ecological consultancy. In a time of unprecedented biodiversity loss it is more important than ever that such interventions are demonstrably effective in achieving positive conservation outcomes. In this opinion piece by the CIEEM Academia Special Interest Group we question whether this is the case and challenge the profession (including ourselves) to do better.

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