



# ***HEREFORDSHIRE RODENT ATLAS***

## ***1960 to 2015***

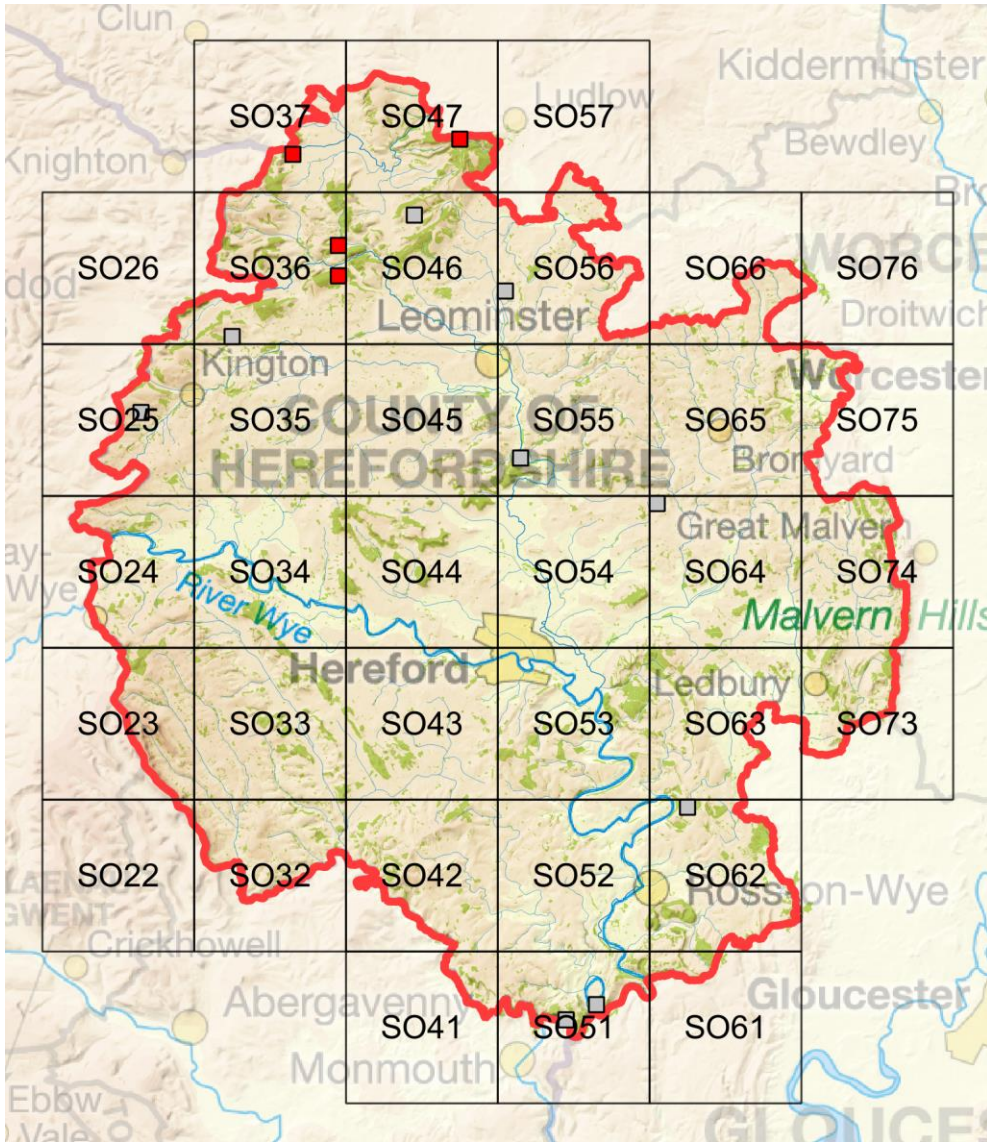
***Produced by Dave Smith, David Lee, Ann Bowker and Denise Foster***  
***Photograph credits: Steve Evans, Denise Foster, Mike Bailey and Dave Smith***

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## Introduction

Herefordshire has 10 out of the 15 UK species of rodent recorded in the county including species of conservation concern, such as the dormouse and water vole. The red squirrel is no longer present in Herefordshire but a few old records exist from 1965 to 1969 in north Herefordshire. It was not considered necessary to include this species in Herefordshire's Rodent Atlas.



Distribution map for red squirrel (red squares) versus grey squirrel (grey squares) from 1965 to 1969.

Rodents are mammals of the order Rodentia, which are characterized by their pair of constantly growing incisors in each of the upper and lower jaws. They use their incisors to gnaw food such as hazelnuts or chestnuts, excavate burrows, and act as a defence against predators. The rodents represent 40% of the 5,400 world-wide mammal species.

Rodents live in a variety of habitats including urban areas and other human environments. Their ecological needs and niches differ greatly between species. Rodents tend to be social animals and many species live in groups. Some species live in burrows like the bank vole, some spend their life being arboreal like the dormouse and the water vole is considered semi-aquatic. Most rodents are small animals with robust

bodies, short limbs, and long tails and mainly feed on seeds or other plant material, but some have more varied diets.

Two sets of distribution maps have been created for this rodent atlas using records taken from the Herefordshire Biological Records Centre (HBRC), Herefordshire Mammal Group's (HMG) records and the National Biodiversity Network Gateway (NBN). One map has been produced using 1001 available records from 1960 to 2000 (red squares) and the second using 2207 records from 2000 to 2015 (blue squares). In total 3208 records were available to create this base-line rodent atlas. The number of records per species is shown below:

<b>Rodents</b>	<b>Number of Records from 1960-2000</b>	<b>Number of Records from 2000-2015</b>
Brown Rat	8	104
Grey squirrel	116	449
Red squirrel	8	0
Bank Vole	24	120
Field Vole	11	107
Water Vole	35	17
Dormouse	599	901
House Mouse	22	20
Wood Mouse	137	217
Yellow-necked Mouse	26	258
Harvest Mouse	15	14
<b>Total Records</b>	<b>1001</b>	<b>2207</b>

#### **Number of records for each species used to create distribution maps**

Explanatory notes about the records and the species have been included in this document in addition to the distribution maps and photographs. Some mouse species are very difficult to determine unless identified in the hand, so the accuracy of some records, particularly from the genus *Apodemus* should be viewed with some caution.

New records will continue to be collected from 2016 onwards from small mammal trapping surveys in woodland, hedgerows, on field boundaries and at dormouse and bat box checks where animals such as the wood mouse, yellow-necked mouse and dormouse are often encountered.



## Brown Rat (*Rattus norvegicus*)



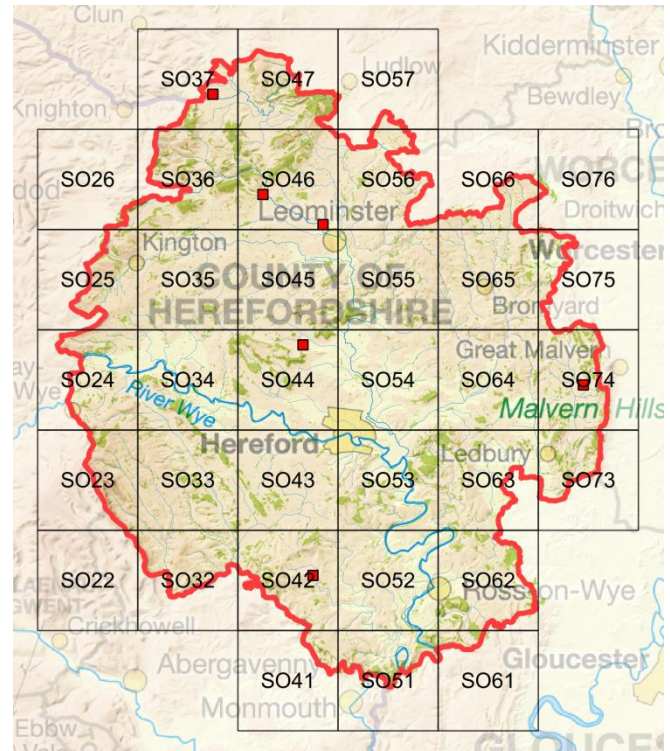
Photo: Brown rat (courtesy Denise Foster)

**Distribution:** The brown rat can now be found in most countries of the world. It is thought to have originated in eastern Russia or China and spread to Britain in the early 18<sup>th</sup> century where it displaced the now locally extinct black rat also known as the ship rat (*Rattus rattus*). The brown rat can be found across the UK including Herefordshire but there are currently very few records in the south west of the county.

**Identification:** It has shaggy grey-brown dorsal fur with a slightly paler under belly. Head and body length is up to 28cm, with a scaly tail of equal length or slightly less (80-100%). The muzzle is quite pointed and its eyes and furred ears are relatively small.

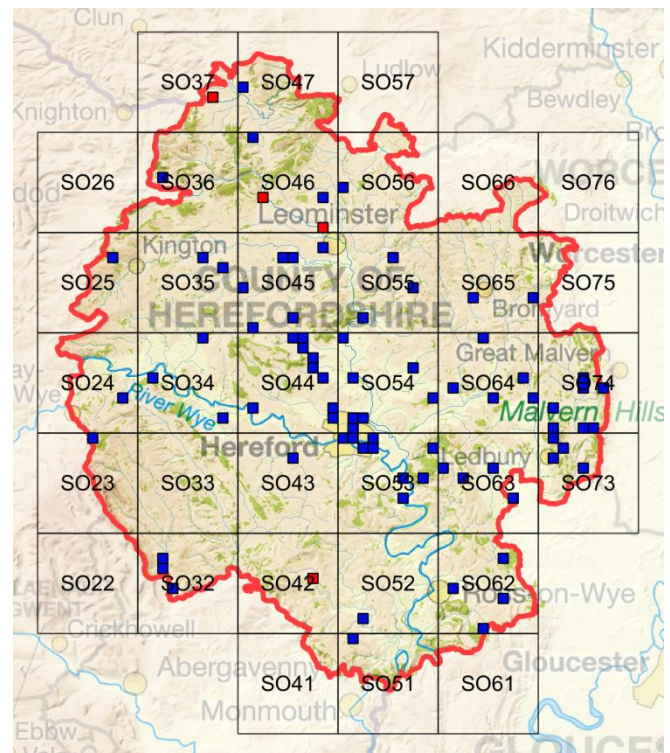
**Feeding habitat and diet:** The rat occurs in most habitats but is generally associated with human activity where food is abundant. Farms, refuse tips and sewers are commonly adopted by the rat because it is a true omnivore, preferring starch and protein rich food. In urban situations it will eat waste meat and bones but in rural areas, cereals and root crops are favoured. It will also eat wild seeds and earthworms. Coastal populations will feed on crabs and molluscs.

**Ecology:** The rat is nocturnal and tends to live in large colonies made up of many smaller 'clans' in a series of underground burrows. In the right conditions it can breed all year round, on average producing five litters per year. Litter size will depend on the weight of the mother and can be between 6 and 11 pups. Populations of brown rats can be very dense and are predominantly made up of young individuals.



Distribution of *Rattus norvegicus* from 1960 to 2000 in Herefordshire

Post-2000 distribution map also includes 5 squares from NBN recorded to genus: *Rattus*



Distribution of *Rattus norvegicus* from 2000 to 2015 in Herefordshire (Pre-2000 records are shown as red squares)



## Grey squirrel (*Sciurus carolinensis*)



Photo: Grey squirrel (courtesy Dave Smith)

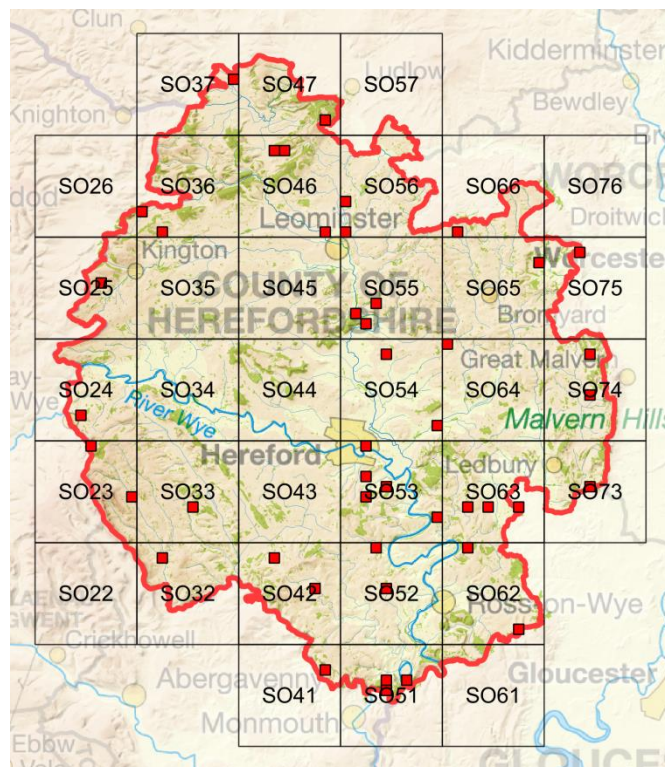
**Distribution:** The grey squirrel is native to eastern North America and it was released in the UK in several locations between 1876 and 1929. It is now common throughout England, Wales, southern Scotland and the east of Ireland. It is found everywhere in Herefordshire but it is probably under recorded.

**Identification:** A medium-sized rodent with an average head and body length of 26cm and a bushy tail of 22cm. The belly fur is white and the dorsal fur is grey with a brown streak down the centre of its back. A bright chestnut colour is visible on the feet, cheeks and limbs.

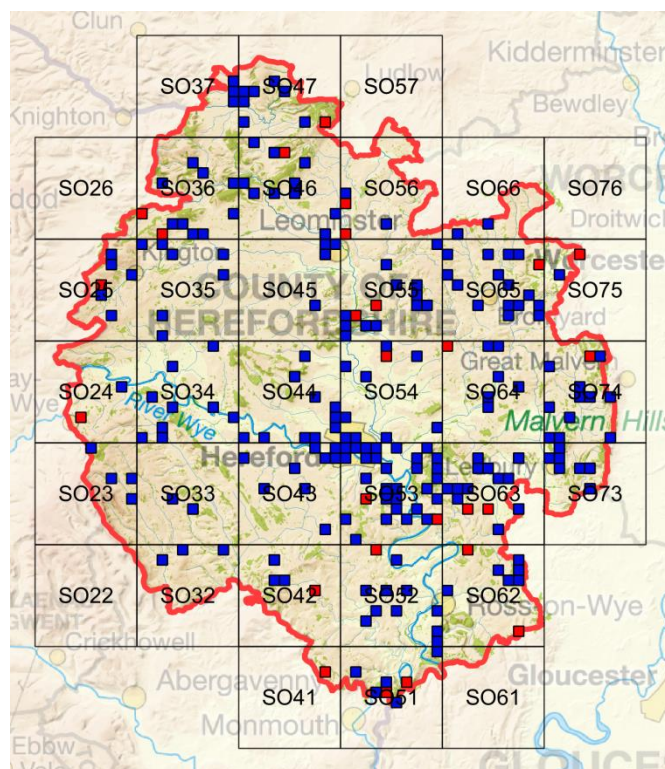
**Feeding habitat and diet:** The grey squirrel is a woodland species, mainly associated with mature broadleaved trees that produce large nuts/seeds such as oak and beech. It will eat most seeds which it will also cache for later. Although arboreal, it will spend a lot of time foraging on the ground. There is some evidence of it preying on birds' nests but this is not thought to be significant. As well as woodland it will often frequent parks and gardens where there is sufficient tree cover.

**Ecology:** Usually solitary except when breeding, but will huddle together in communal nests in the winter. On average two litters are born per year in the spring and summer months, usually with 2-4 young. Nests, known as dreys, are spherical balls of twigs, lined with softer material such as shredded bark and leaves in the centre. Tree cavities are often used but many dreys are built in the open tree canopy. The grey

squirrel is controlled by foresters due to its habit of stripping bark which can cause significant financial losses.



Distribution of *Sciurus carolinensis* from 1960 to 2000 in Herefordshire



Distribution of *Sciurus carolinensis* from 2000 to 2015 in Herefordshire (pre-2000 records are shown as red squares)



## Bank Vole (*Myodes glareolus*)



Photo showing pelage (courtesy Steve Evans)



Photo showing tail length (courtesy Mike Bailey)

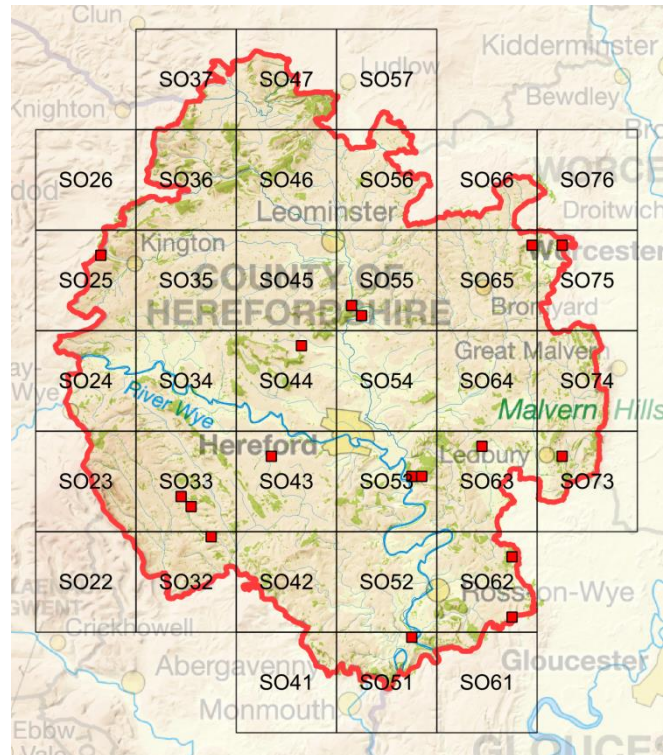
**Distribution:** The bank vole is native across most of Europe and into western Siberia. It is common across the UK, with the exception of Northern Ireland and some Scottish islands. In Herefordshire, it is widespread and most likely under-recorded.

**Identification:** Its head and body length is between 8cm and 12cm. It has a blunt nose, small ears and eyes. The dorsal fur is chestnut brown with a paler off-white under belly. Fur colour and the longer tail length distinguish it from the field vole. Its tail is up to half the head and body length.

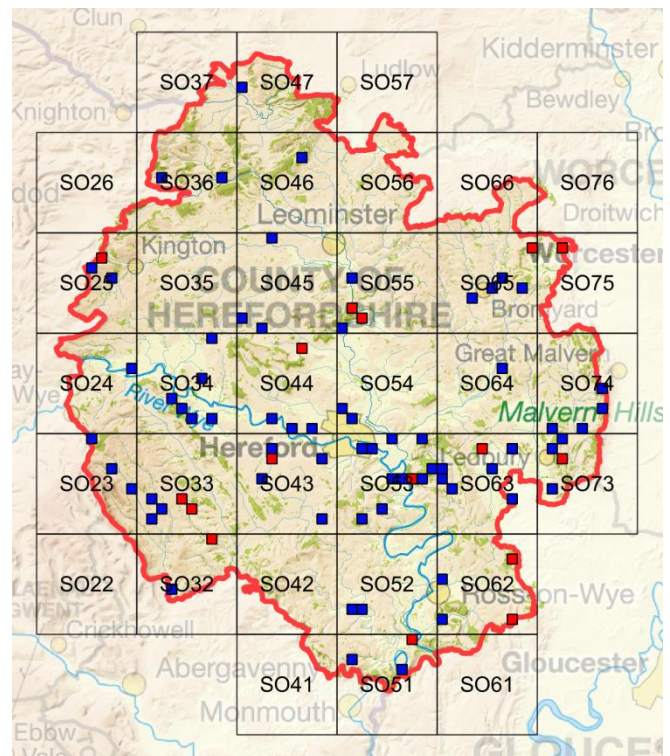
**Feeding Habitat and Diet:** It is predominantly found in mixed broadleaf woodland, but it also inhabits scrub, hedgerows, rural gardens and conifer plantation. Its diet is almost entirely plant based, eating fruits, seeds, nuts, roots, fungi and green vegetation. It is also known to occasionally eat insects and earth worms.

**Ecology:** It is active both day and night and lives and breeds in shallow burrows, which are just below ground level. Nests are made of local materials including leaves, moss and grass depending on the habitat and can also be above or below ground. Several litters are born between April and October, with an average size

of four young. Litter size and breeding season is variable depending on food availability and weather conditions.



Distribution of *Myodes glareolus* from 1960 to 2000 in Herefordshire



Distribution of *Myodes glareolus* from 2000 to 2015 in Herefordshire (pre-2000 records are shown as red squares)



## Field vole (*Microtus agrestis*)



Photo: Field vole showing its short tail (courtesy Steve Evans)



Photo: Field vole with grey-brown pelage (courtesy Steve Evans)

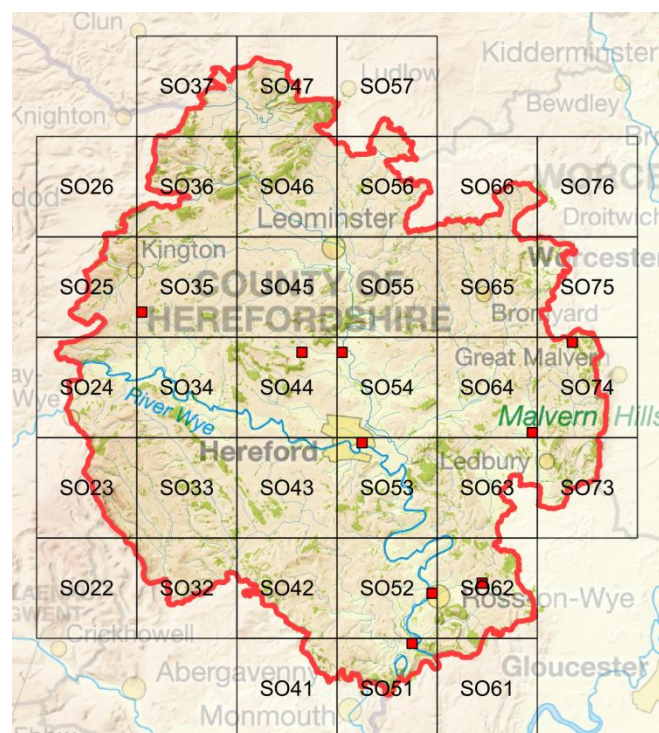
**Distribution:** The field vole is native to most of Europe and extends in the east across Russia and into Asia. In mainland UK it is common and widespread but absent from Ireland, and several other smaller islands, including the Channel Isles and the Isles of Scilly. In Herefordshire, it is widespread and most likely under-recorded.

**Identification:** A small mammal with a blunt nose and small eyes. It is similar in size and appearance to the bank vole but with a greyish brown pelage rather than the darker chestnut brown of the bank vole. The tail is shorter, being approximately a third the length of the head and body.

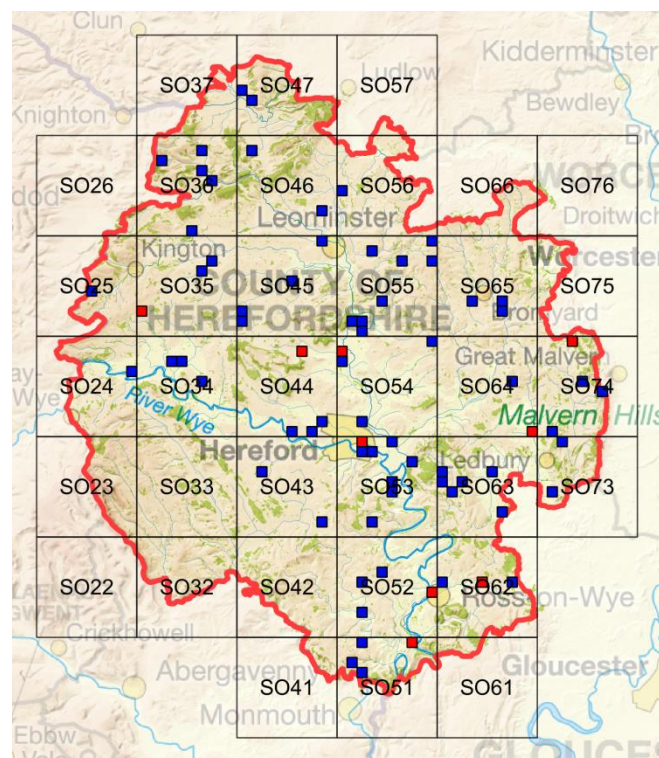
**Feeding habitat and diet:** The field vole is mainly found in un-grazed pastures and meadows, arable field margins and young forestry plantations. It can also be found in hedgerows and gardens. Its diet consists predominantly of grasses and herbs but has been known to eat bark in the winter months when other food sources are scarce.

**Ecology:** Like most small mammals the field vole does not live very long and it has a life span of approximately 12 months. It has several litters of young during the breeding season, typically between the months of March and October. Nests are made of grass and can be found on the ground at the base of

tufts of grass or sometimes just under the ground. Field signs include small runways in grass fields interspersed with latrines and food caches of cut grass.



Distribution of *Microtus agrestis* from 1960 to 2000 in Herefordshire



Distribution of *Microtus agrestis* from 2000 to 2015 in Herefordshire (pre-2000 records are shown as red squares)



## Water vole (*Arvicola amphibious*)



Photo: Water Vole (courtesy Steve Evans)



Photo: Water Vole (courtesy Steve Evans)

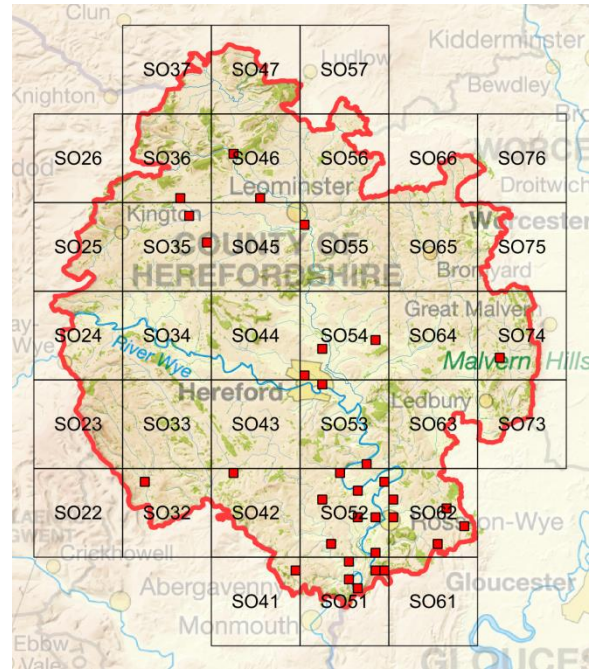
**Distribution:** The water vole is native across Europe, Russia and West Asia. It can be found in most of mainland UK but numbers are declining. In Herefordshire records are quite sparse, with most sightings in the south of the county around Ross-on-Wye.

**Identification:** The largest of our native voles, with a head and body length of approximately 20cm and a tail of around 12cm. It is often mistaken for a rat, but it has a much blunter nose and rounder body, and the tail is noticeably shorter.

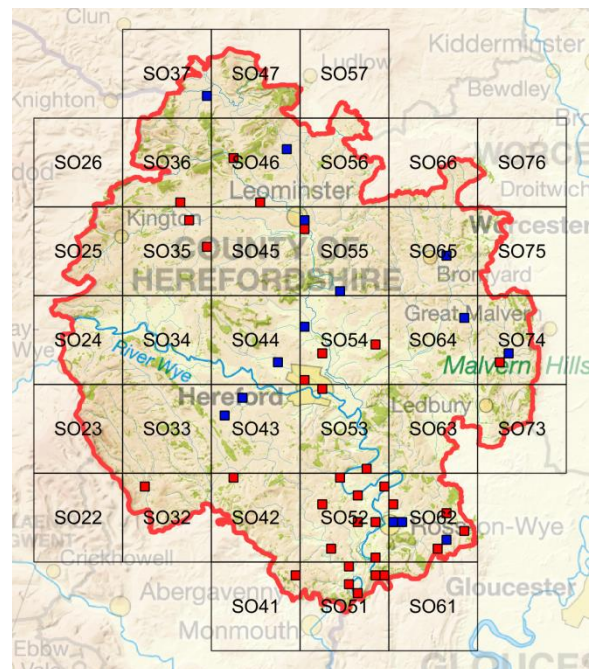
**Feeding habitat and diet:** As the name suggests, the water vole is found around water bodies, where it makes burrows in the banks. Well vegetated sites are preferred. It is predominantly vegetarian and feeds on grasses, reeds and herbs. In the winter roots and rhizomes are eaten, and on rare occasions, insects and molluscs.

**Ecology:** The water vole is active sporadically throughout both day and night. Nests are usually found within a complex burrow system beneath the ground of river banks, although where the water table is high, they can sometimes build nests above ground in tussocks of sedge. The average life expectancy in the wild is usually around two years. Five litters can be born in a year with up to six young. During the winter

months, nests can be shared by small family groups, but during the breeding season, females set up territories which are marked with large latrines. A female will usually mate with only one male per year but males can have multiple pairings. The American mink is a serious predator of the water vole, but they are also preyed on by others such as stoat, heron, barn owl and fox, to name a few.



Distribution of *Arvicola amphibious* from 1960 to 2000 in Herefordshire.



Distribution of *Arvicola amphibious* from 2000 to 2015 in Herefordshire (Pre 2000 records are shown as red squares)



## Hazel or Common Dormouse (*Muscardinus avellanarius*)



Photo: Hazel dormouse (courtesy Denise Foster)

**Distribution:** The hazel dormouse is not a mouse at all, but a member of the Dormouse family (Gliridae), which has 28 members, Suborder Sciurimorpha – squirrel-like rodents. It is indigenous to Europe (though not Iberia) and east into Turkey and parts of western Russia. In Britain it used to be common in England and Wales, but is now confined south of a line from the Wash to mid-East Anglia, Cumbria and several small areas where it has been reintroduced. Herefordshire is a stronghold and it can be found in most areas with suitable habitat.

**Identification:** Our only native species of dormouse, the hazel dormouse looks like a small mouse, but can be distinguished by its furry tail and orange/russet pelage with whitish throat and belly. The female can have one or two litters a year in May/June and September/October with an average of four in a litter and a maximum of seven. Juveniles can be recognised by the remains of their grey coat which can persist into their second year. The hazel dormouse can make nests all year round which typically have a defined cup surrounded by woven grass or bark and then an outer layer of carefully arranged green leaves. However, materials vary greatly according to what is available. It is generally nocturnal and less active during the day. The winter nest for hibernation is built at ground level where temperature and humidity are more even.

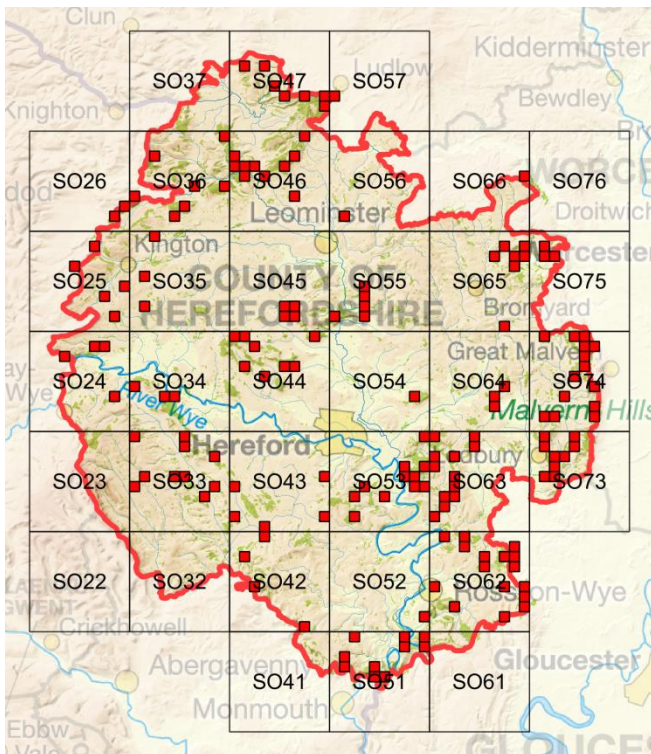
**Feeding habitat and diet:** The hazel dormouse is generally found in woodland, preferably with a good understorey and a wide variety of plants and trees. Mature hedgerows are also a good habitat. It needs a high-energy diet throughout its active season from sometime in April to around the beginning of November (depending on the weather). Its diet includes pollen, fruit and nuts supplemented by invertebrates. Male territories cover a larger area than the female and this will result in a male dormouse having more than one female in his home range. The dormouse will climb right into the crown of trees and down amongst the brambles. It is extremely adaptable and can survive in conifer woods and scrub land with no hazel. It is not dependent on hazel, but coppiced woodland which often contains hazel is a very favourable habitat where it was frequently encountered in the past, whence came its name.

**Protection:** The hazel dormouse is a protected species which should not knowingly be disturbed, handled, or taken from the wild without a licence from Natural England.

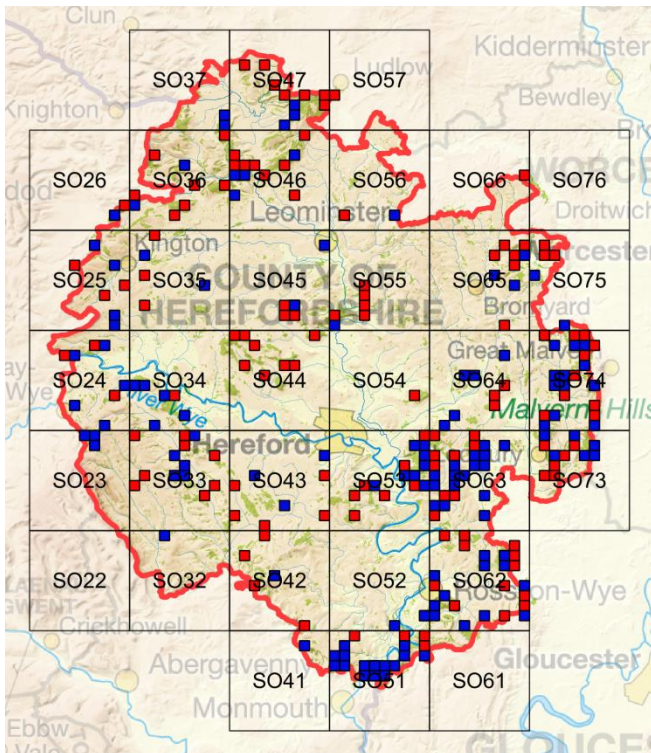


Photo: Dormouse nest (courtesy Mike Bailey)



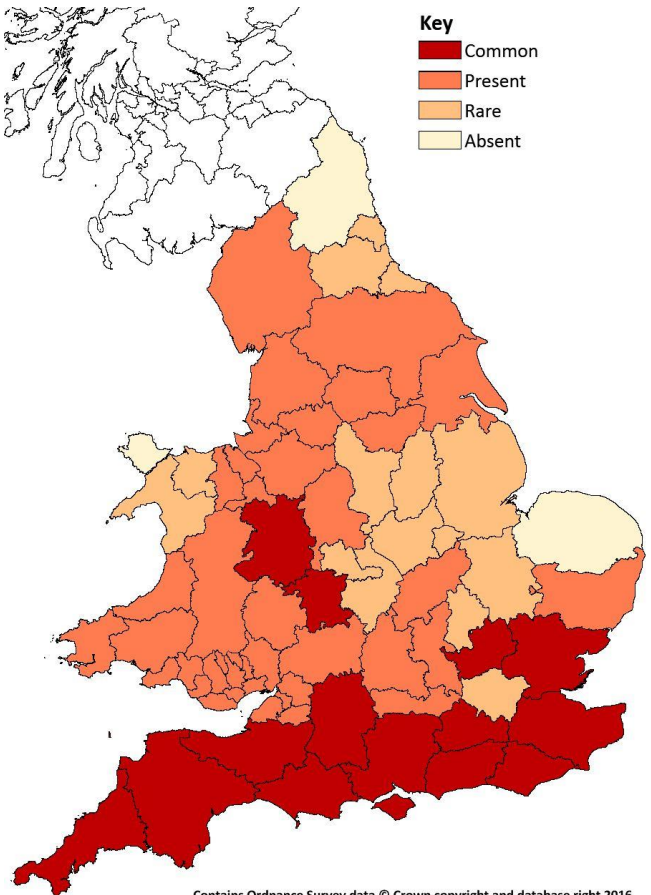


Distribution of *Muscardinus avellanarius* from 1960 to 2000 in Herefordshire

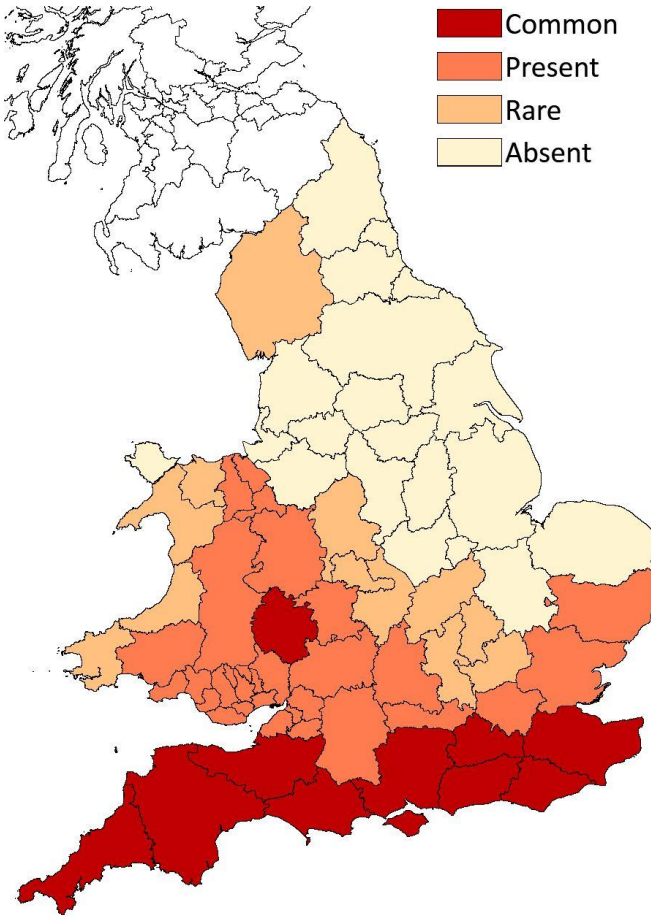


Distribution of *Muscardinus avellanarius* from 2000 to 2015 in Herefordshire (Pre 2000 records are shown as red squares)

The following two distribution maps were extracted from the State of British Dormouse 2016 report produced by People's Trust for Endangered Species. This data was obtained from the National Dormouse Monitoring Programme. The geographical range of dormice in Britain has shrunk since the 19th century.



Distribution of dormice in 1885 (described by G. T. Rope)



Distribution of dormice in 2016, taken from current NDMP data



## House Mouse (*Mus musculus*)



Photo: House mouse showing its grey pelage (courtesy Steve Evans)



Photo: House mouse (courtesy Steve Evans)

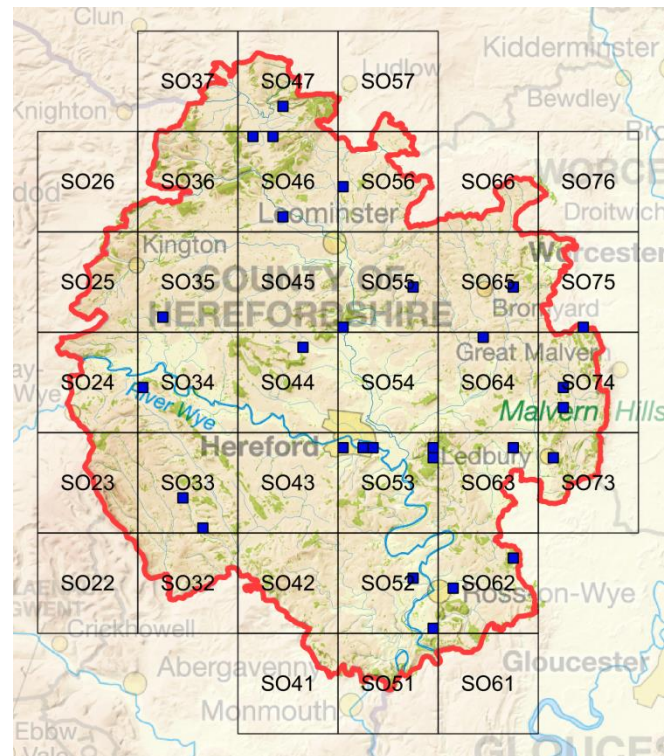
**Distribution:** The house mouse is thought to have been resident in the UK since the iron-age, and is now widespread, with the exception of a few un-inhabited islands. Records in Herefordshire are currently sparse.

**Identification:** It has a dark dullish grey dorsal fur with a slightly lighter underbelly. It can be mistaken for juvenile wood mouse, which also has grey fur, but the eyes, ears and hind feet are smaller on a house mouse. It is similar in size to the wood mouse but the tail is roughly 80% of the head and body length and tends to be almost naked and slightly thicker.

**Feeding habitat and diet:** It does not compete well with other mice and is rarely found in woodland but takes advantage of human habitation, where other mouse species are less frequent. In these habitats, it will eat almost anything it finds from grains and seeds to biscuits, cheese and flour. It is most commonly found in and around farm buildings.

**Ecology:** It is generally nocturnal but will venture out in the daytime when it feels safe. Mice that live within buildings will breed all year round and will nest anywhere with shelter. House mice that live outside will build a nest similar to a wood mouse and it will nearly always be underground. A good nest site can

be shared by more than one female and the females will suckle any young, whether it is their own or not.



Distribution of *Mus musculus* from 2000 to 2015 in Herefordshire. There are no records for the House Mouse from 1960 to 2000. Post-2000 NBN data only recorded to genus: *Mus* (6 squares)



## Wood Mouse (*Apodemus sylvaticus*)



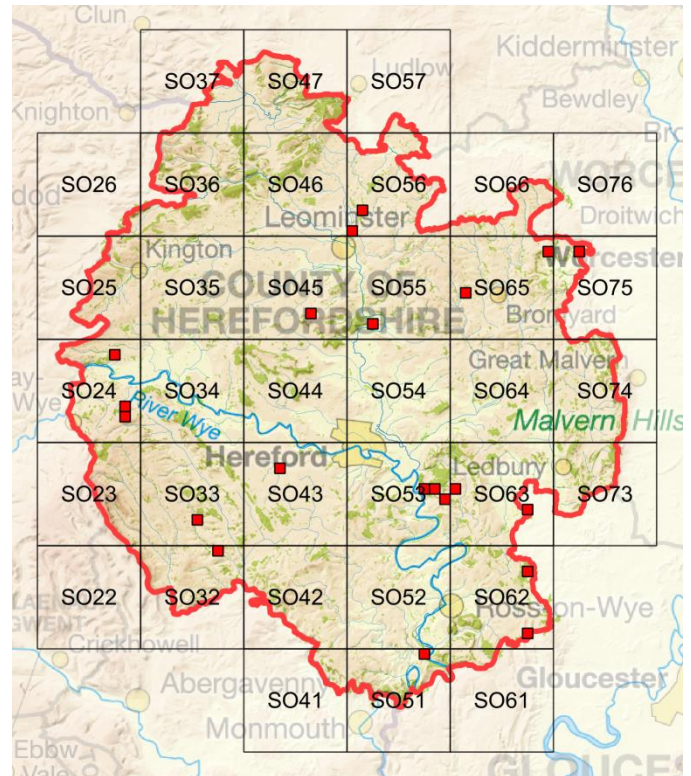
Photo: Wood mouse showing large eyes and ears (courtesy Steve Evans)

**Distribution:** Native to Europe and Northwest Africa. In the UK, the wood mouse is ubiquitous with the exception of a few small islands. Records in Herefordshire are sparsely spread across the county but it is presently under-recorded.

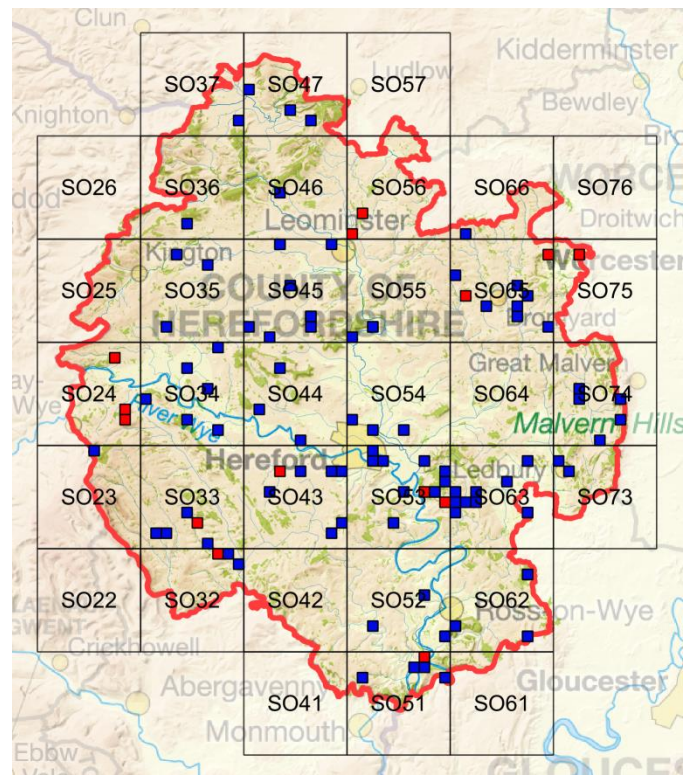
**Identification:** An adult wood mouse has a head and body length of between 8cm and 10cm with a tail of equal length. The dorsal fur is dark brown with a distinctly paler belly. Juveniles tend to be greyer in colour. It has large eyes and ears are prominent and larger than most other British rodents, as are their hind feet with a length of around 3cm.

**Feeding habitat and diet:** It is found in most habitats, and is equally at home in ancient woodland or young coniferous plantations. It also frequents arable land, urban gardens, open meadow, dry stone walls, hedgerows and river banks. Its diet is omnivorous, eating mainly nuts and seeds when they are available, changing to buds in the spring and invertebrates in the summer months. Feeding remains and food caches are indicative of their presence

**Ecology:** The wood mouse is the most common rodent in Britain and in the right conditions populations can reach up to 100 mice per hectare. It is nocturnal in habit and tends not to stray too far from cover. Nests are usually made in the chambers of underground burrow systems, but can also be found above ground in tree hollows and bird boxes. Multiple litters of 5-6 young are born between February and November and life expectancy from weaning is only 8-14 weeks.



Distribution of *Apodemus sylvaticus* from 1960 to 2000.



Distribution of *Apodemus sylvaticus* from 2000 to 2015 in Herefordshire (pre-2000 records are shown as red squares)



## Yellow-necked Mouse (*Apodemus flavicollis*)



Photo: Yellow-necked mouse (courtesy Steve Evans)



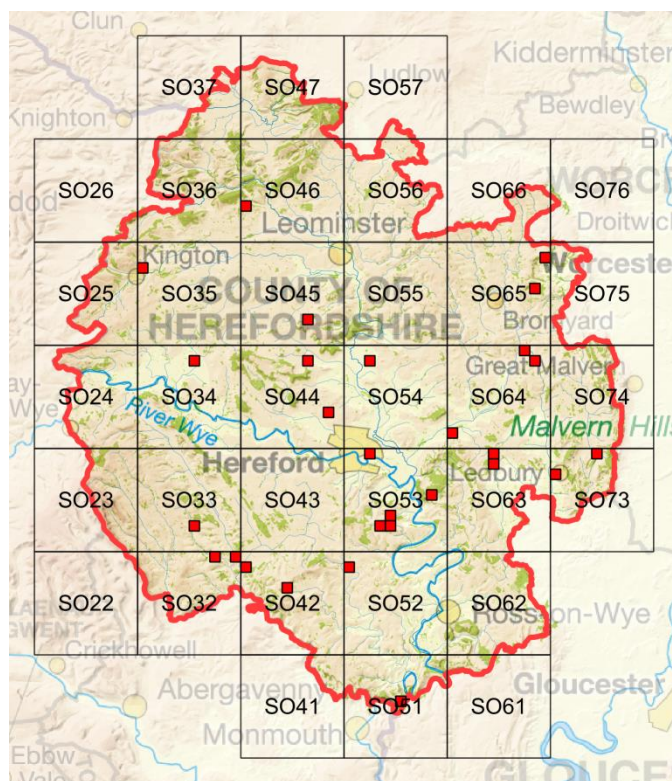
Photo: Yellow-necked mouse (courtesy Steve Evans)

**Distribution:** It is found mainly in Central Europe, but distribution extends south into Italy and north into Scandinavia and southern Britain. In Herefordshire it is recorded in most 10km squares but very sparsely.

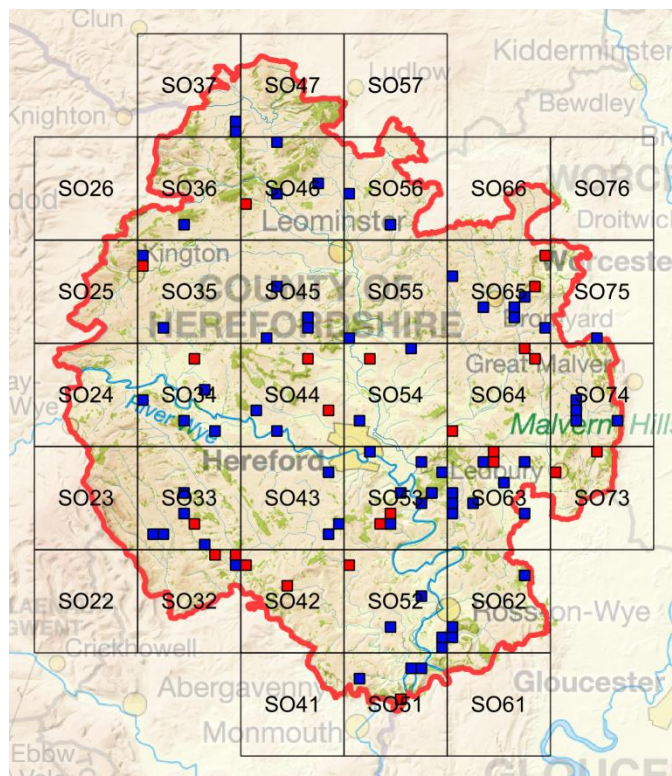
**Identification:** It is very similar to the closely related wood mouse but it has a yellow band of fur which extends un-broken across the neck from one side to the other. The tail is usually slightly longer than the body and thicker at the base than in the wood mouse.

**Feeding habitat and diet:** It is more reliant on woodland than the wood mouse, especially woods with a more closed canopy and a greater diversity of hard seeds and fruit. It can survive in field margins and hedgerows but is less efficient at extracting grass seed than wood mice. Large food caches of nuts, seeds and sometimes invertebrates are sometimes made underground.

**Ecology:** It rarely lives over one year old but generally it does not survive through the winter as well as the wood mouse. It builds extensive underground burrows where it spends much of its time, but it can also reach great heights up in the woodland canopy where it has been recorded for several days before returning to the ground.



Distribution of *Apodemus flavicollis* from 1960 to 2000 in Herefordshire



Distribution of *Apodemus flavicollis* from 2000 to 2015 in Herefordshire (pre-2000 records are shown as red squares)



## Harvest Mouse (*Micromys minutus*)



Photo: Harvest mouse (courtesy Steve Evans)

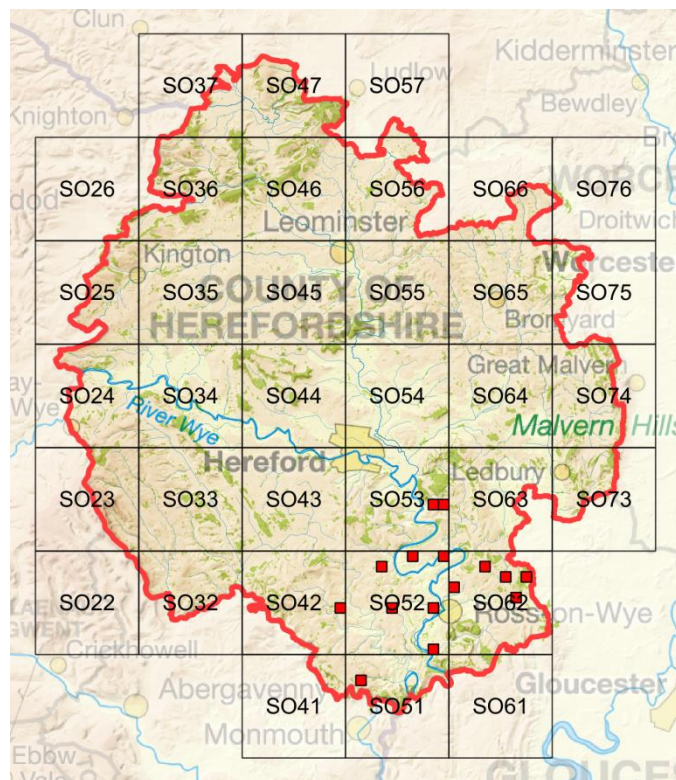
**Distribution:** The harvest mouse is found in mainland UK, eastwards through central Europe and across Asia. In Britain it is found mainly in the east and south of England with small localized populations in Scotland and Wales. Herefordshire is on the edge of its natural range and there are very few records in the county. Most of our records are found south east of Hereford around Ross and Ledbury, which may be due to its actual distribution or lack of survey effort.

**Identification:** The smallest of our native rodents with an average head and body length of 57mm with a similar length tail and weighing only 6 to 8 grams. It has a blunt nose, small ears and eyes and similar in profile to a vole. The dorsal fur of the adult is a russet or orange with longer dark tipped guard hairs, and the belly fur is white. The fur of the young is greyer.

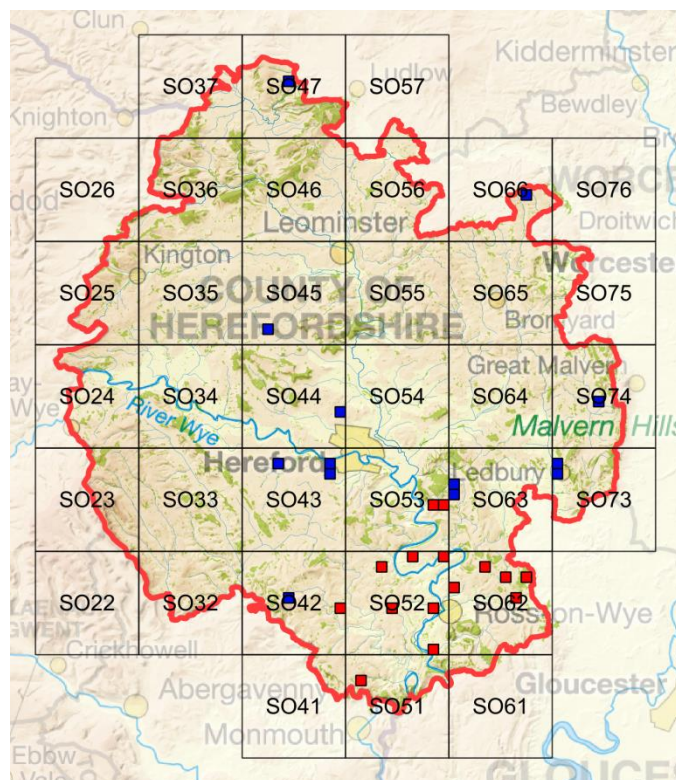
**Feeding habitat and diet:** It is omnivorous, eating invertebrates including caterpillars and moths, seeds and fruits, leaves and even small carrion. It inhabits undisturbed rough grassland, which can include road verges, field margins and marsh and reed beds. Its small size and prehensile tail allows it to feed in the stalk zone of tall plants and grasses where it forages for seeds and grain, as well as invertebrates.

**Ecology:** During the warmer months, it inhabits the stalk zones of tall grasses and herbs. Breeding nests are woven into living plants up to 100cm or more above the ground. The stems of grasses and other monocotyledons are shredded and incorporated into the nests, which are built by pregnant females. Breeding is generally from May through to October with a peak in late summer. Two to three litters are normal with an average litter size of about five young. Winter nests are often built on the ground, and animals adopt a more terrestrial life style at this time of year, using runs and burrows of other mice, though they do not create their own. Population densities fluctuate wildly with densities as high as 200/hectare

recorded in autumn months with as little as 1% surviving through to the following spring.



Distribution of *Micromys minutus* from 1960 to 2000 in Herefordshire



Distribution of *Micromys minutus* from 2000 to 2015 in Herefordshire (pre-2000 records are shown as red squares).