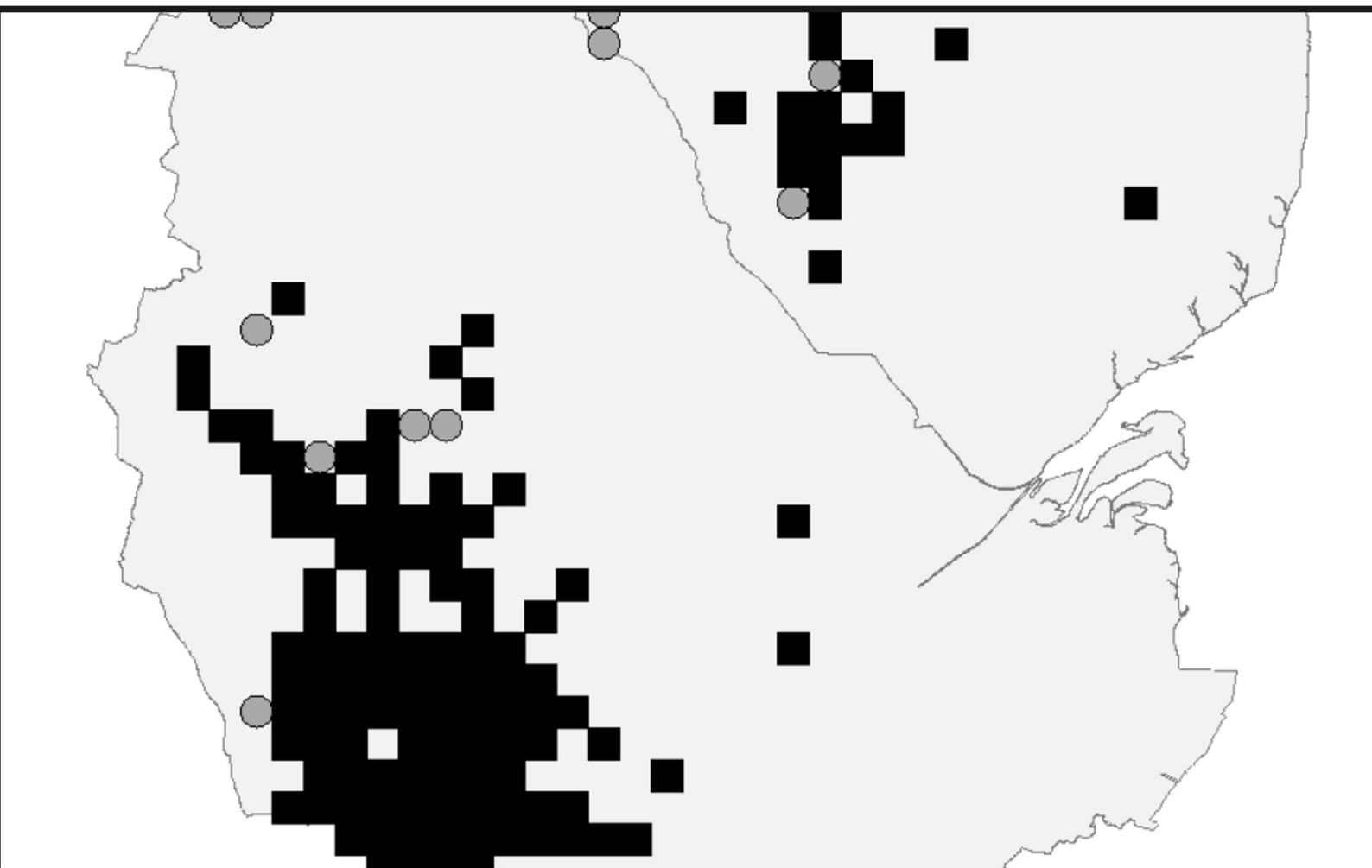


# Atlas of the terrestrial and semi-aquatic mammals of Lincolnshire

C J Manning

June 2016



#### About the Lincolnshire Naturalists' Union

The Lincolnshire Naturalists' Union was founded in 1893 and so has over a hundred years' experience and information in Lincolnshire's wildlife and geology. In that time we have seen the county change almost beyond recognition, and have a wealth of observations on just how those changes have affected our wildlife made on over 600 field meetings all over the county. The LNU is the only amateur Natural History Society covering the whole of Lincolnshire. Members study, record, hold meetings, supply information, publish books, exhibit, discuss and learn. We welcome new members.

#### About the Greater Lincolnshire Nature Partnership

The work of the Greater Lincolnshire Nature Partnership focuses on eight key areas. The delivery workstreams include the Geodiversity Strategy, the Lincolnshire Environmental Records Centre, Local Sites and the Nature Strategy. The strategic workstreams involve working with people and organisations across four thematic areas: Farming with nature; Planning with nature; Enjoying nature and Being well with nature.

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# Introduction

This account focuses on the distribution of Lincolnshire's terrestrial and semi-aquatic marine animals. Bats are recorded separately, with a report on their status, 'Bats: An assessment of current status in Greater Lincolnshire', recently published (Greater Lincolnshire Nature Partnership, 2013).

While many would imagine that mammals are extensively recorded there are actually limited records, compared to other groups. While Blaythwayt (1912) published a 'Preliminary List of the Lincolnshire Mammals' it was not until 1982 that the first 'Atlas of the Mammals, Reptiles and Amphibians of Lincolnshire and South Humberside' was produced by Johnson. Much later again a brief update on mammal recording was published by Manning in 2010.

National mammal survey and species accounts are relatively well known and frequent. In Lincolnshire they are notable by their scarcity - a survey of grey and red squirrels was carried out by the War Agricultural Executive Committee (Shorten, 1946); with a review of the mustelids of Lincolnshire (Crick, 2004) and deer and deer parks (Manning, 2006) in more recent years. Recording of individual species is now more regularly undertaken at an organisational level and fed into wider schemes; for example the water vole monitoring undertaken by many of the Internal Drainage Boards.

Interest in recording has boomed in recent years with the internet offering a plethora of choices, it is hoped that this will lead to an increase in mammal records and knowledge of the species in this account. The digital age was first explored by the LNU in the mid-1990s with the development of the weekly Lincolnshire Wildlife News Bulletin, diligently edited by Roger Parsons for over two decades. The development of the Lincolnshire Environmental Record Centre in 2007 marks another significant milestone for recording.

This work would not have been possible without the many individuals who have submitted records. The following organisations have also contributed significant datasets: Environment Agency, Lincolnshire Wildlife Trust, Mammal Society, National Trust, People's Trust for Endangered Species, Royal Society for the Protection of Birds and the Internal Drainage Boards of Lincolnshire.

Scientific name: *Halichoerus grypus*

Common name: Grey seal

Earliest record: E 1975

Latest record: L 2015

Number of records: R 871

Number of 2km squares the species occurs in: S 32

Records per month:

Month	Records
J	54
F	3
M	1
A	2
M	8
J	8
J	13
A	6
S	14
O	79
N	351
D	302

Date classes:

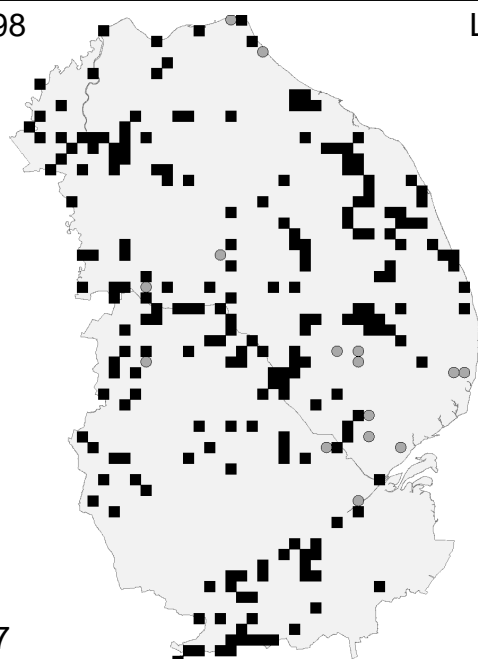
- 1980 to 2015 (Black square)
- 1600 to 1980 (Grey square)

Species description: Grey seals can be found on the Lincolnshire coast from Grimsby to Gibraltar Point, with occasional records from inland of individuals wandering through the river system. The grey seals at Donna Nook are a hugely popular visitor attraction, with 1,889 pups born in 2015, yet breeding only began in the 1970s. The UK population has a clockwise cline in the mean birth date, pups in the south-west born in August and September, in north-east Scotland in September and October while in Lincolnshire in November to December (Joint Nature Conservation Committee, 2013a). A record near North Somercotes was of a bull displaced by the December 2013 tidal surge that lived temporarily in a drainage board watercourse before being hit by a car when crossing the road. The UK population estimate is 76,100 - 116,300 and is increasing at an average of 1% per annum over the last 10 years (Joint Nature Conservation Committee, 2013a).

***Lutra lutra*****Otter**

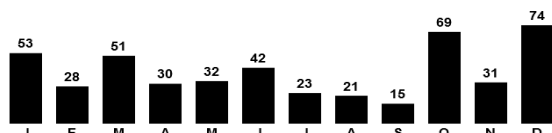
E 1898

L 2015



R 587

S 248



The otter can be found throughout the county with absence likely to reflect under-recording rather than a true absence, the network of rivers, streams and drainage ditches providing suitable habitat.

Road casualties make up a high proportion of recorded sightings and an increase in records in the winter may be a result of otters roaming more widely to find sufficient food during the colder months.

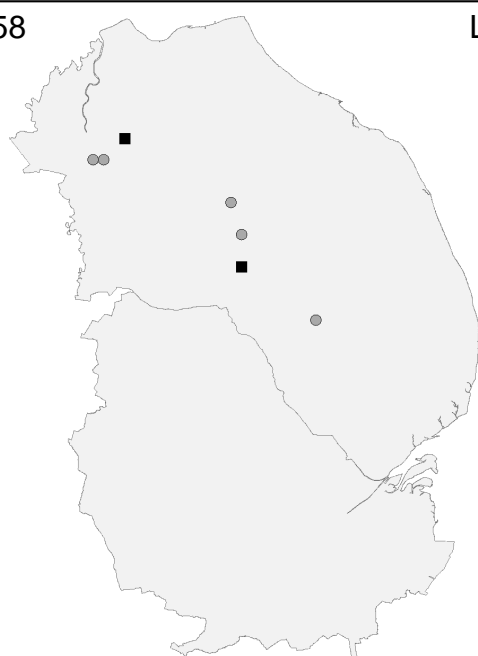
Although widespread today, the otter population declined dramatically between the 1950s and 1970s, with pesticides widely blamed. Johnson (1982) reported otters across the county in surveys undertaken between 1975 and 1978 and subsequently a single spraint was recorded in 1994 (Crick, 2004).

Releases in the 1990s (Manning, 2010) were preceded by surveys that found otter presence at all the release sites which confirm anecdotal reports that the otter was never extinct in Lincolnshire.

***Martes martes*****Pine marten**

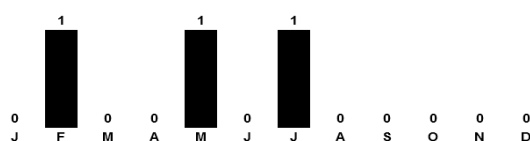
E 1858

L 2003



R 7

S 7

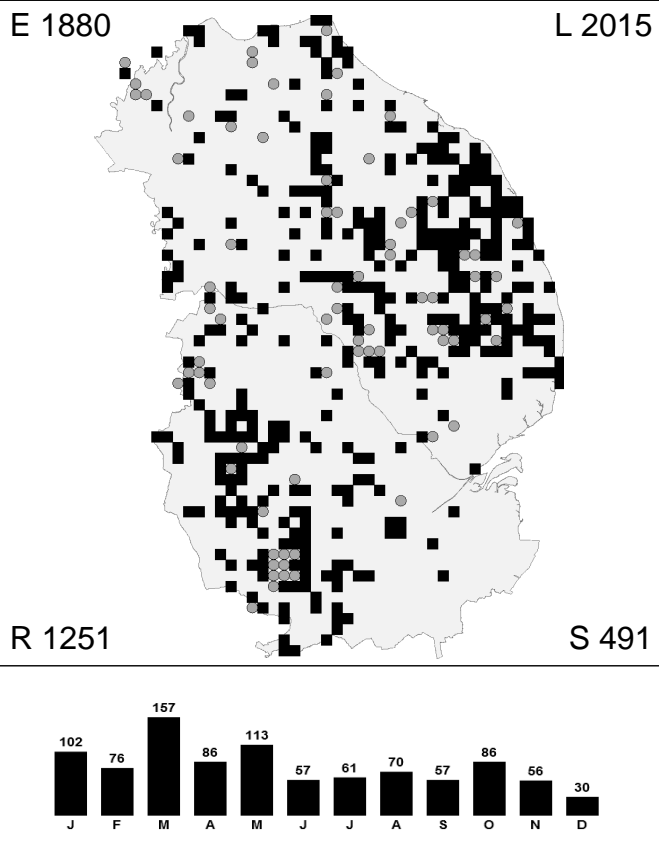


Johnson (1982) reported that the pine marten was last recorded in 1905, but reported new sightings during 1975-78 in Willingham Forest, Loughton Forest and Norton Disney of "almost certainly" introduced animals. Two subsequent unverified records in 2003 were thought by the Vincent Wildlife Trust to be pine martens (Crick, 2004).

Although nationally the pine marten is expanding its range it is extremely rare in England (except in the border regions of Wales and Scotland (Harris & Yalden, 2008)) and the suspicion must be that these unverified records are mistaken identification of other mustelids.

Meles meles

Badger



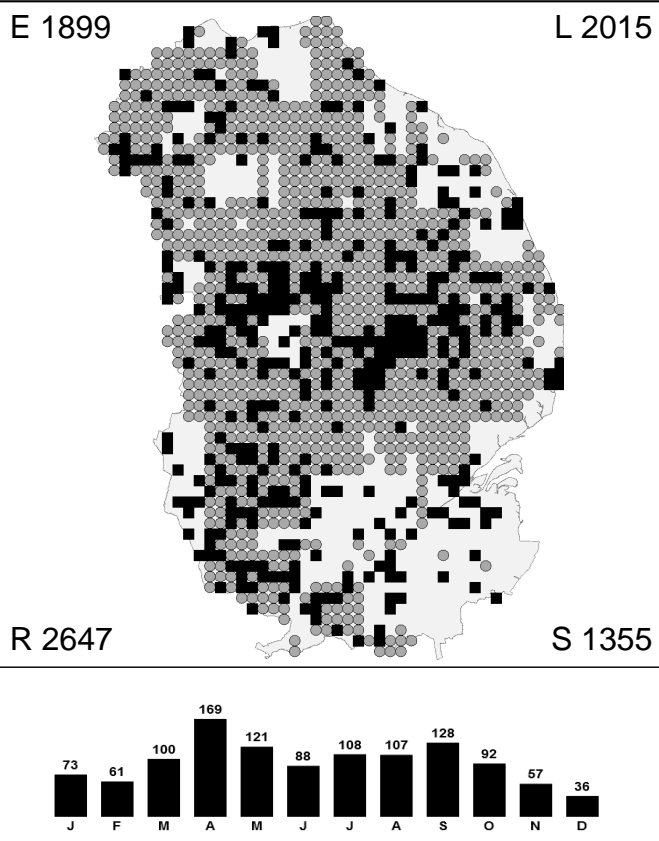
A widespread and common species in Lincolnshire which is likely to occur everywhere. Concentrations of records in the east and south-west of the county are almost certainly a result of active recording efforts.

The vast majority of the records are from road traffic accidents with additional records from evidence such as setts, latrines and guard hairs.

Blaythwayt (1912) considered that badger numbers in Lincolnshire were increasing, particularly in the northern part of the Lincolnshire Wolds, and Crick (2004) noted a substantial increase in the badger population since legal protection (Protection of Badgers Act 1992).

Mustela erminea

Stoat



The stoat is widespread in Lincolnshire, with concentrations in the centre of the county likely a result of increased recording activity.

Ermine examples, where the coat turns white in winter, have been reliably recorded and verified.

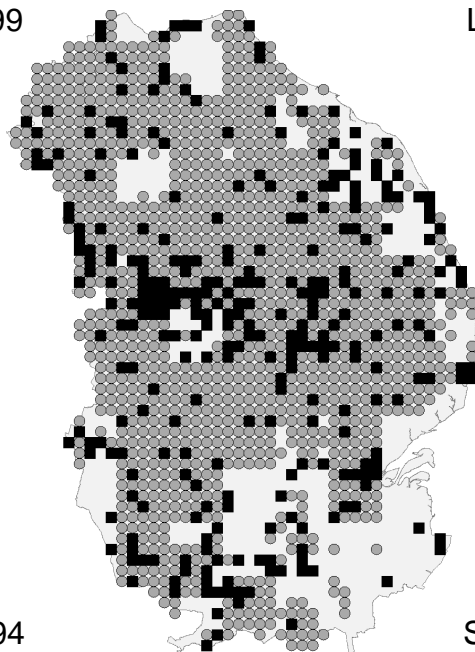
The National Gamebag Census reports a long term increase in the population that broadly follows the increase of its main prey, the rabbit (GWCT, 2014).



*Mustela nivalis***Weasel**

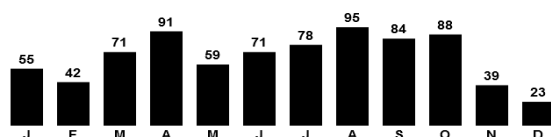
E 1899

L 2015



R 2294

S 1417



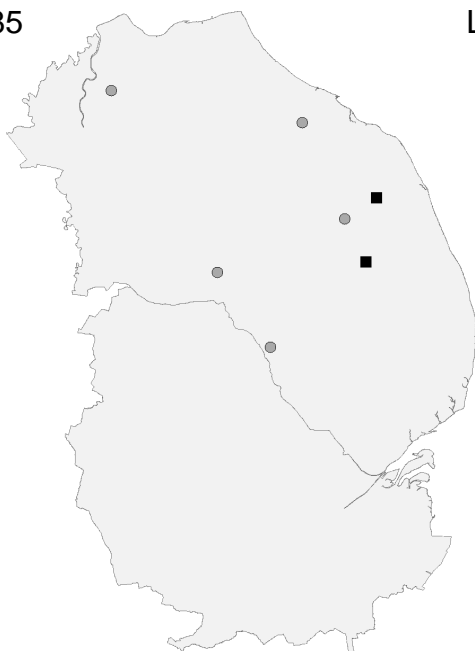
As with the stoat, the weasel is widespread in the county.

The National Gamebag Census reports a decline in the weasel population between 1961 and the late 1980s/early 1990s with a significant increase (GWCT, 2014) noted since then. The pattern of change is in direct contrast with that of the rabbit which suggests a negative effect of rabbit grazing on vole and mice abundance, the weasel's main prey (GWCT, 2014).

*Mustela putorius***Polecat**

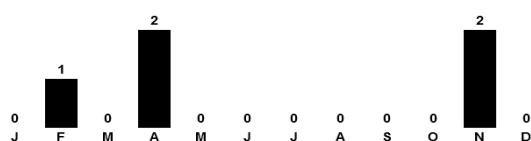
E 1885

L 2008



R 9

S 7

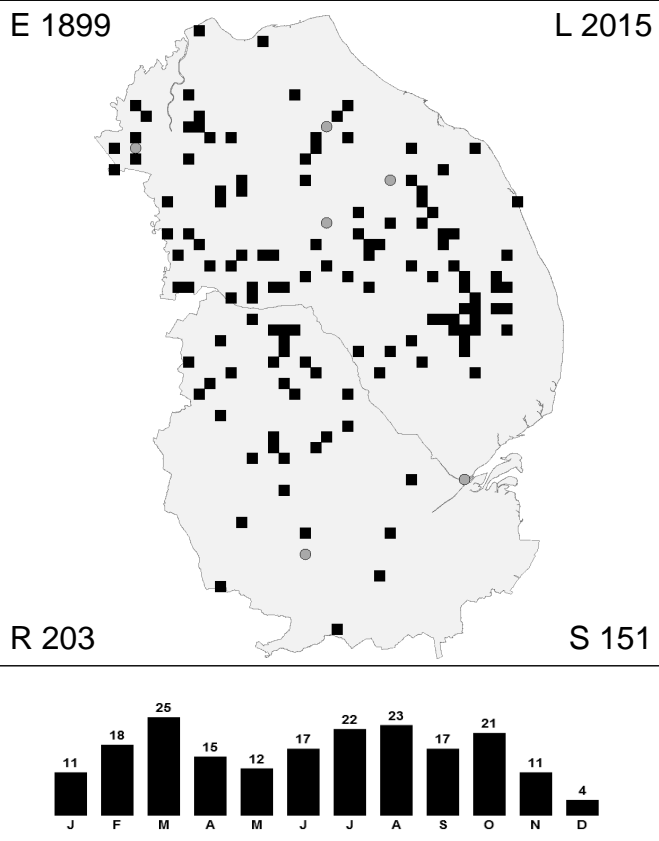


Polecats nationally are expanding from their Welsh stronghold and will eventually reach Lincolnshire. Occasional records of true polecats in Lincolnshire, confirmed via pelage characteristics, are animals coexisting and interbreeding with the genetically virtually identical ferret.

Historical records show a widespread but scarce distribution in the northern half of the county.

Mustela putorius f. furo

Polecat-ferret

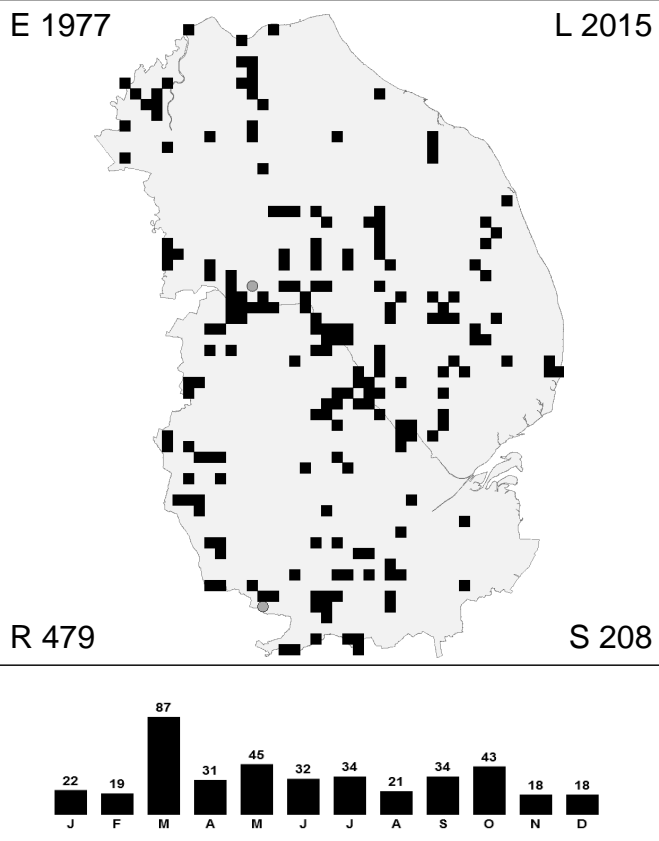


The polecat-ferret is widespread in Lincolnshire, becoming scarce in the Fens. Ferret numbers have increased in recent years perhaps due to their increasing popularity as pets and subsequent escapees and this may also explain the lack of records in the Fens.

An account of the polecat-ferret in Lincolnshire was published in 2009 (Manning) with polecat-ferret crosses colloquially called 'fummonds' in the county.

Neovison vison

American mink



Native to North America, the American mink was first recorded in Lincolnshire in 1977 originating from escapees or intentional releases from fur farms. The practise of keeping animals for their fur was banned by the Fur Farming (Prohibition) Act 2000 with the last fur farm in Lincolnshire ceasing to keep mink in 2002.

Nationally since 1978 the mink population has declined and has been associated with the recovery of otter numbers over the same period, through interspecific competition and/or increasing mink control to conserve water voles (GWCT, 2014). Current studies are suggesting that a parasitic bile fluke may be influencing mink numbers (Sherrard-Smith, et al. 2009).

Today, American mink are widespread in Lincolnshire.

*Vulpes vulpes*

Red fox

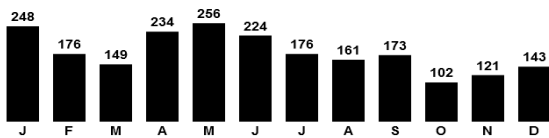
E 1899

L 2015



R 4031

S 1511



The red fox is a common and widespread species in Lincolnshire with areas lacking records almost certainly due to under-recording. Red foxes are increasingly reported in towns, where their diet includes human food waste.

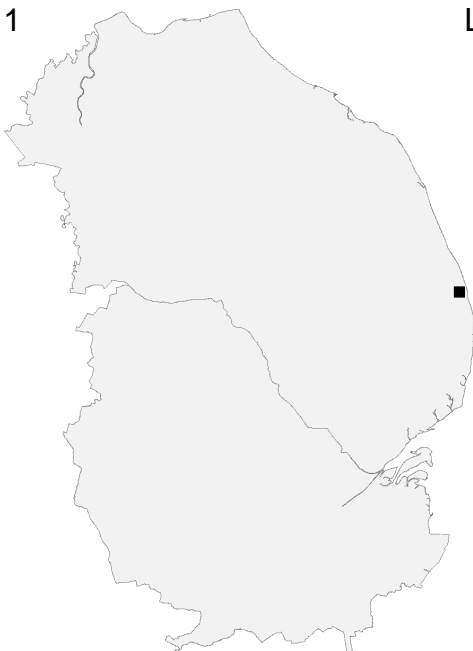
As with the stoat the red fox population is increasing, which may be associated with the increase in rabbits since the 1950 population crash due to myxomatosis (GWCT, 2014).

*Cystophora cristata*

Hooded seal

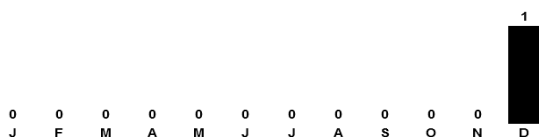
E 2011

L 2011



R 1

S 1

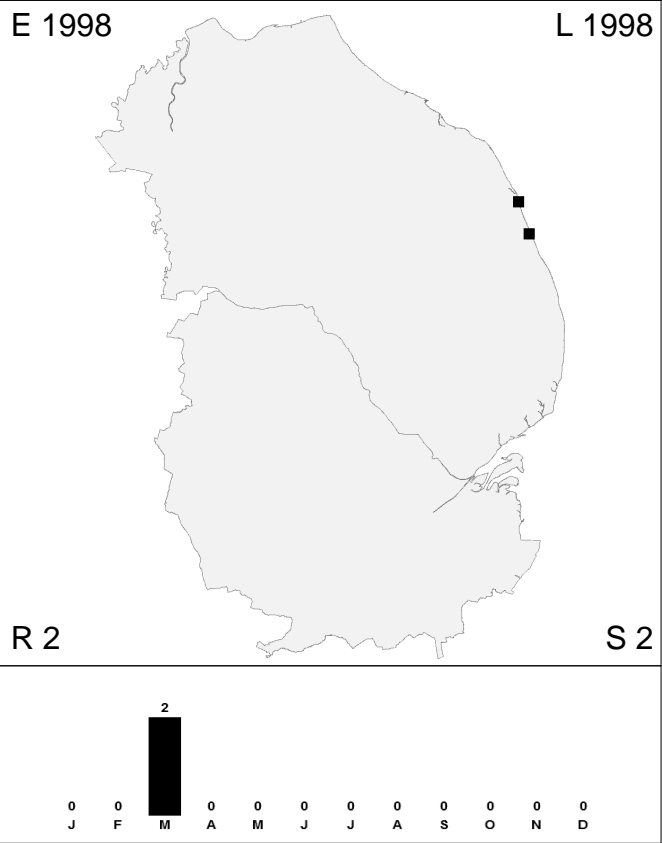


The hooded seal is a vagrant species occasionally recorded from British waters which is normally found in the Arctic Ocean.

The story of Eve was published in 2012 (Manning). Eve originated from the Arctic; after a saunter to Germany where she was rescued and released she was rescued for a second time on the Lincolnshire coast at Chapel St Leonards. Eve lived the remainder of her life at Natureland in Skegness. One previous Lincolnshire record is reported (Harris & Yalden, 2008).

*Erignathus barbatus*

Bearded seal

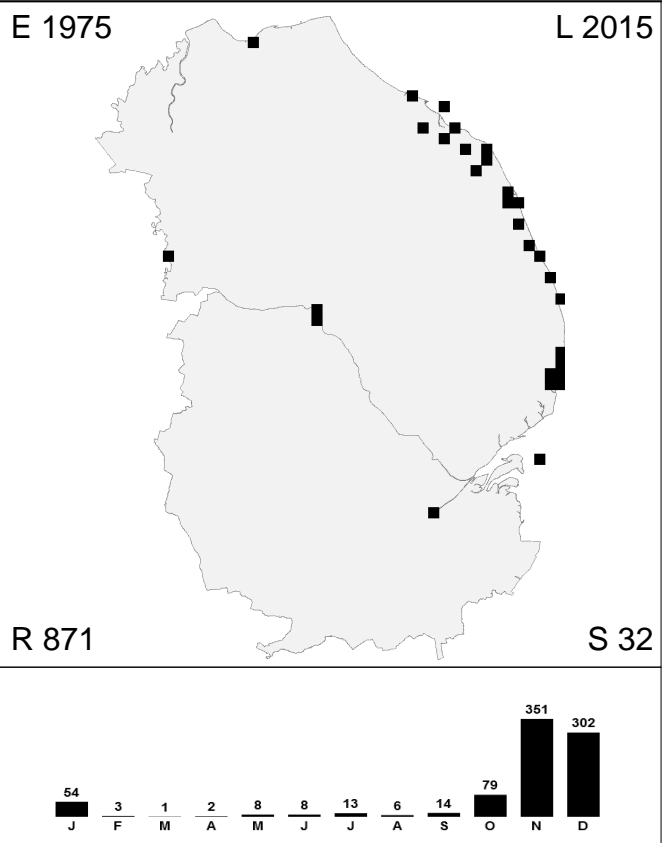


The two records from March 1998 relate to a single animal rescued by Mablethorpe Seal Sanctuary and Wildlife Centre and later released. As with the hooded seal, the bearded seal is a vagrant species which is occasionally seen in British waters which is normally found in the Arctic Ocean.

The Lincolnshire records and a single record from Norfolk are the most southerly known (King, 2007).

*Halichoerus grypus*

Grey seal



Grey seals can be found on the Lincolnshire coast from Grimsby to Gibraltar Point, with occasional records from inland of individuals wandering through the river system.

The grey seals at Donna Nook are a hugely popular visitor attraction, with 1,889 pups born in 2015, yet breeding only began in the 1970s. The UK population has a clockwise cline in the mean birth date, pups in the south-west born in August and September, in north-east Scotland in September and October while in Lincolnshire in November to December (Joint Nature Conservation Committee, 2013a).

A record near North Somercotes was of a bull displaced by the December 2013 tidal surge that lived temporarily in a drainage board watercourse before being hit by a car when crossing the road.

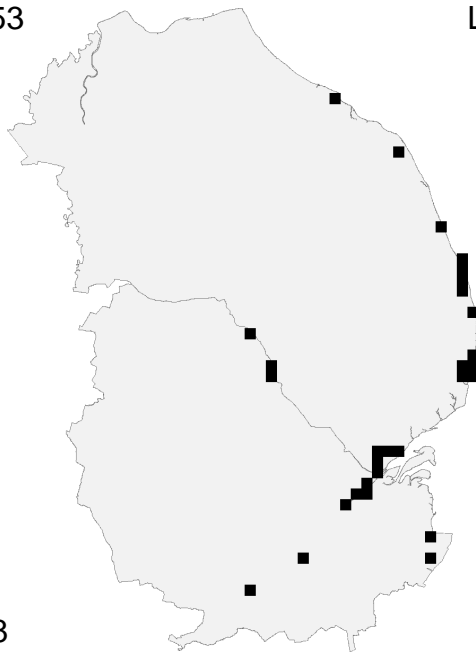
The UK population estimate is 76,100 - 116,300 and is increasing at an average of 1% per annum over the last 10 years (Joint Nature Conservation Committee, 2013a).

*Phoca vitulina*

## Common seal

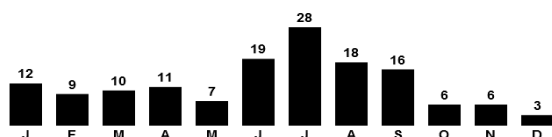
E 1953

L 2015



R 158

S 34



Similar to the grey seal, the common seal occurs on the Lincolnshire coast from Grimsby to Gibraltar Point, but also occurs widely in the Wash. Inland records relate to individuals travelling through the river system.

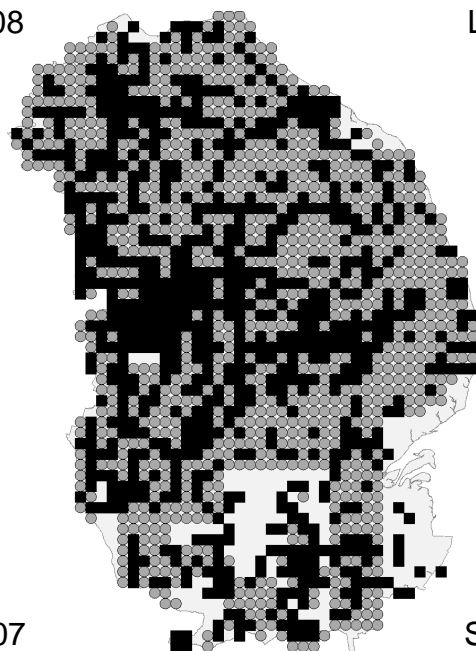
The UK population is estimated at 29,900 - 48,650 (Joint Nature Conservation Committee, 2013b), with populations on the east coast focused on the major estuaries of the Thames, The Wash, and the Moray Firth (Joint Nature Conservation Committee, 2013b). Competition with grey seals is considered to be one of the most likely factors in the decline of common seal numbers in recent years (Joint Nature Conservation Committee, 2013b), with Phocine Distemper Virus outbreaks on the east coast reducing the population by 52% in 1988 and 22% in 2002 (Joint Nature Conservation Committee, 2013b).

*Erinaceus europaeus*

## Hedgehog

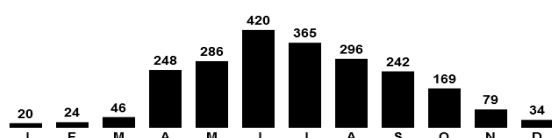
E 1908

L 2015



R 5107

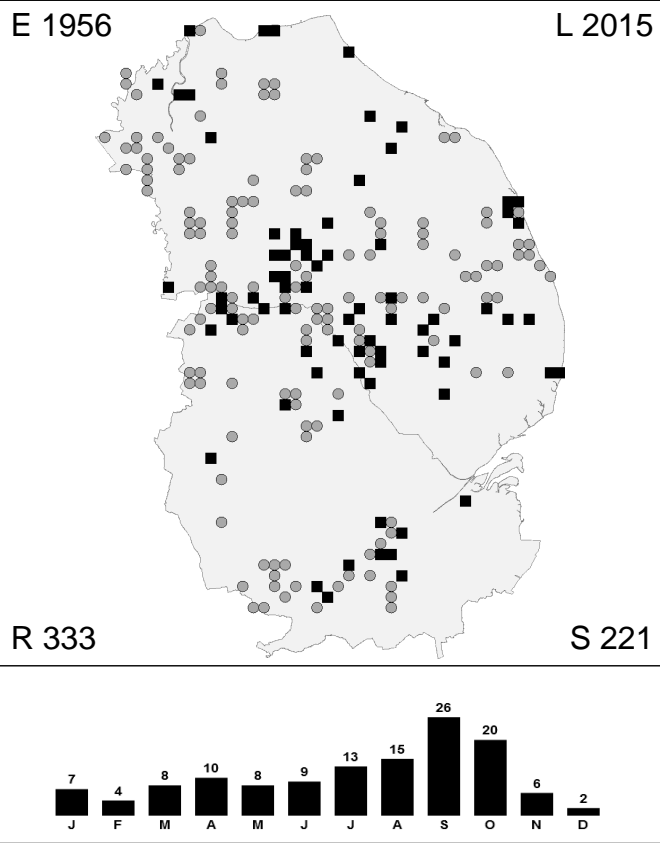
S 1650



The hedgehog can be found across Lincolnshire with an increasing number of records a result of the concern over the decline in population, with over 50% of Lincolnshire records of road casualties. The reason for the decline, which coincides with the rise of the badger population (GWCT, 2014), is not known, but may be direct predation or the habitat not supporting assemblages of the two species.

Neomys fodiens

Water shrew

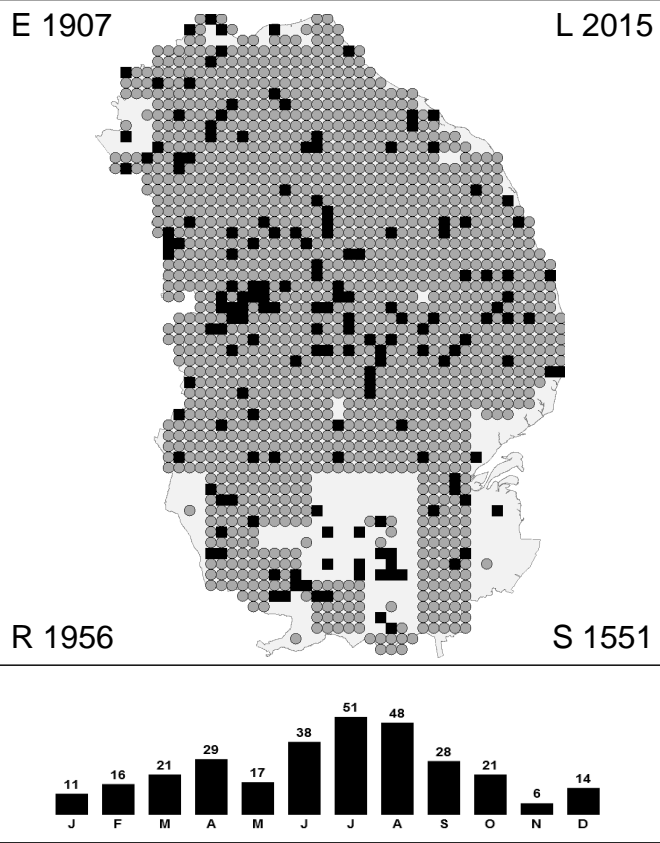


A widespread but scattered distribution suggests a lack of recording effort rather than a restricted distribution in the county.

Other than barn owl pellets and trapping, surveying for water shrew can also be undertaken using bait tubes as they feed on aquatic invertebrates that can be detected in the scats.

Sorex araneus

Common shrew



The common shrew is a widespread species which can be expected to be found throughout the county, with lack of recording accounting for the paucity of records.

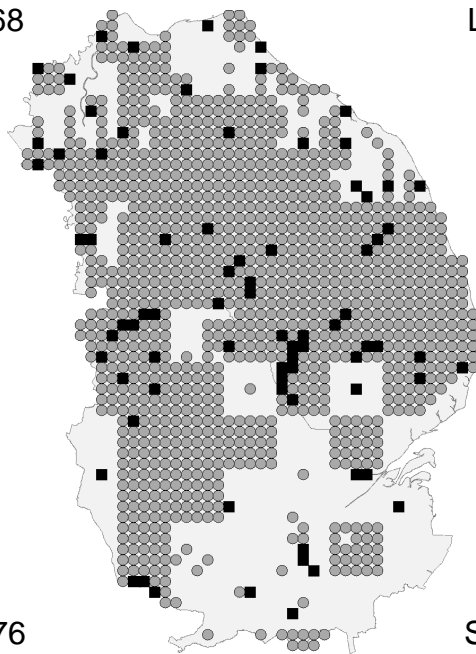
Johnson (1982) combined the distribution map for the common and pygmy shrew; as with other small mammals, such as the bank vole and field vole, shrews were considered widespread.

The common shrew is larger than the pygmy shrew and has a tri-coloured coat. The tail is proportionally shorter with less hair and it lacks the domed head.

***Sorex minutus*****Pygmy shrew**

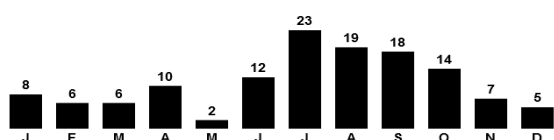
E 1968

L 2015



R 1376

S 1199



As with common shrew, the pygmy shrew is believed to be a widespread species in Lincolnshire, with both species having an extensive distribution in the UK (Harris & Yalden, 2008). Lack of recording effort, rather than absence, is almost certainly the reason for scarcity of records.

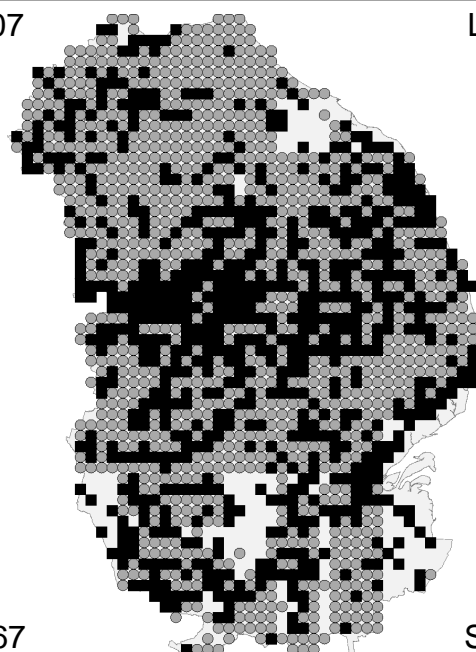
The pygmy shrew is smaller than the common shrew with a paler two-tone coat, rather than common shrew's tri-coloured coat. Proportionately the tail is longer and much hairier than the common shrew tail and the head is far more domed.

Shrews are short lived animals and many records are of dead individuals found on paths in later summer.

***Talpa europaea*****Mole**

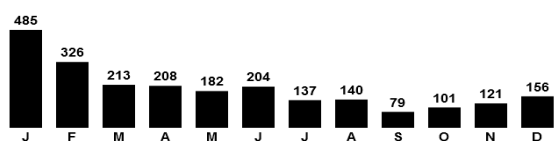
E 1907

L 2015



R 4367

S 1660

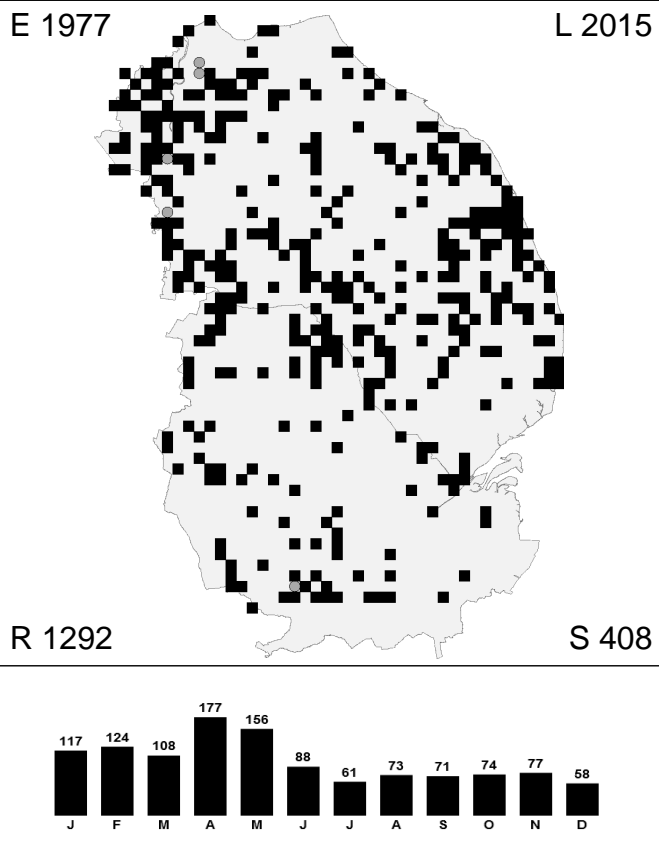


The mole is a common and widespread species in Lincolnshire, with areas lacking records due to under-recording; as with the shrew species, the mole has a widespread distribution in the UK (Harris & Yalden, 2008).

At least one albino mole has been recorded in Lincolnshire.

Capreolus capreolus

Roe Deer

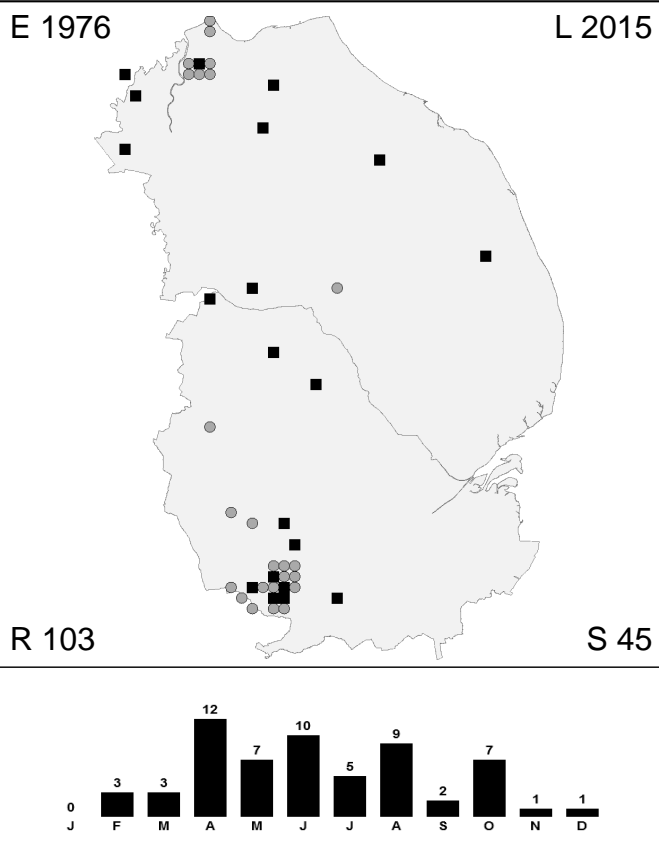


The roe deer is widespread across Lincolnshire and is likely to found in all suitable habitats with the colonisation of Lincolnshire since 1969 mirroring the national trend, due to the spread of native animals from Scotland (Manning, 2006).

The 19th century introductions of native stock in Dorset and Sussex and Germanic animals in Suffolk (Prior, 1995) are now intermingling with our native animals in Lincolnshire.

Cervus elaphus

Red deer



The red deer has a scattered distribution across Lincolnshire, with two main populations resulting from escapees from Grimsthorpe in World War II and farmed animals on Thorne and Hatfield Moors where breeding was first reported in 1996 (Jones, et al).

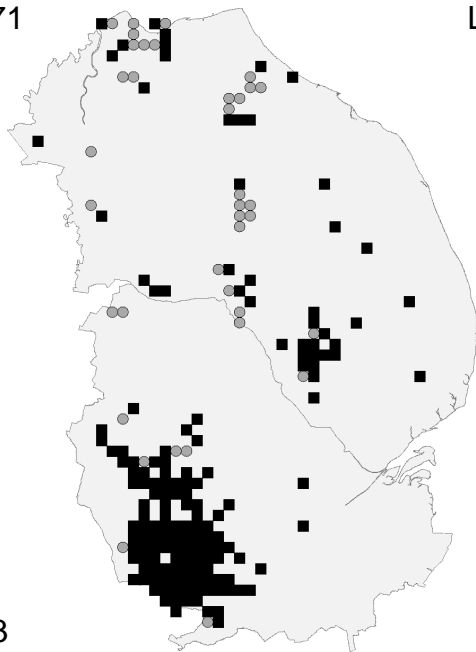
A small number have been recorded on Worlaby Carrs, which probably originate from farmed animals many of which are of continental origin.



***Dama dama*****Fallow deer**

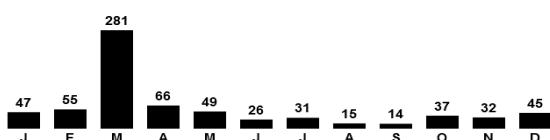
E 1971

L 2015



R 833

S 199



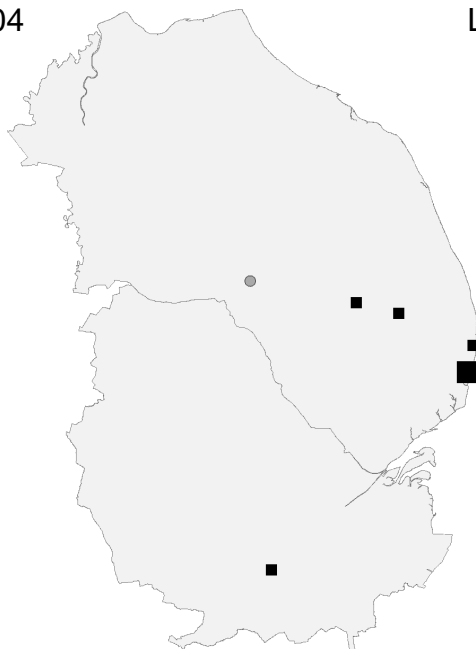
The main concentration of fallow deer occurs in the south-west of the county with occasional sightings reported from elsewhere.

The quintessential park deer, fallow deer were introduced successfully by the Normans, with the present populations mostly based on escaped park deer. The population on Read's Island in the Humber Estuary were deliberately released for grassland management (Manning, 2006).

***Hydropotes inermis*****Chinese water deer**

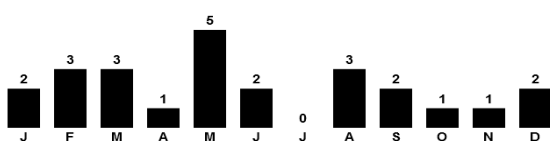
E 2004

L 2014



R 27

S 9

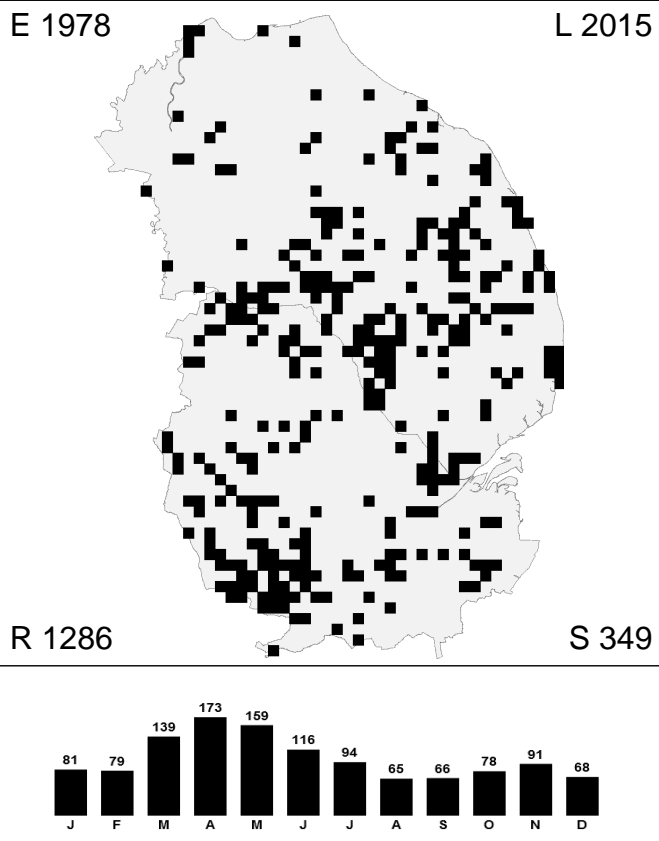


The Chinese water deer is our rarest deer, with a national population of less than 2,000 animals (Macdonald & Tattersall, 2001 cited in Battersby, 2005). Native to Asia, they were first reported in the wild in 1945, and found mainly in East Anglia, with small isolated populations mainly in Cambridgeshire, Norfolk and Suffolk, occasional records in south Lincolnshire may well be the result of natural spread, but animals seen since 2004 at Gibraltar Point suggest a release in eastern Lincolnshire.

Globally the Chinese water deer is listed on the International Union for Conservation of Nature's Red List as a vulnerable species with the population declining due to poaching and habitat destruction (Harris & Duckworth, 2008). Detailed current information on the population is not available, although Wemmer (1998) reported 10,000 animals in Asia meaning the English population may comprise over 20% of the world resource (Harris, & Duckworth, 2008).

Muntiacus reevesi

Muntjac

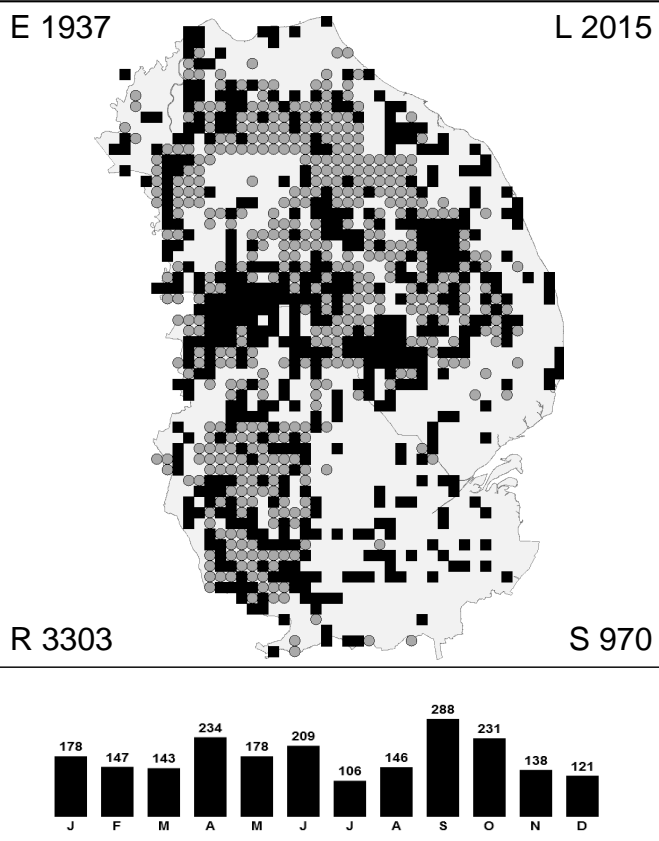


As with the Chinese water deer, the muntjac is native to Asia. In Lincolnshire, they have been reported from the 1970s in Bourne and Willingham Woods (Manning, 2006) and are now widespread throughout the county.

The expansion of muntjac distribution in Lincolnshire is partly due to deliberate releases (Manning, 2006) before they were added to Schedule 9 of the Wildlife and Countryside Act prohibiting their release.

Sciurus carolinensis

Grey squirrel



The grey squirrel is a common and widespread species in Lincolnshire that can be expected in any suitable habitat. Concentrations in urban areas are likely the result of better recording, but absence from less well wooded areas, such as the Fens may well represent an accurate picture of their distribution.

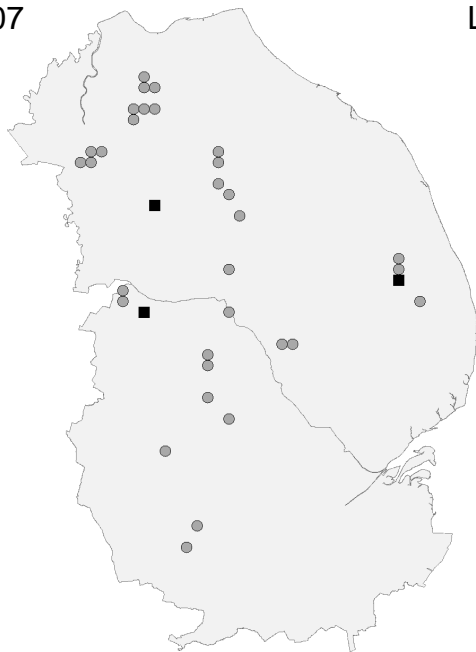
Native to North America, grey squirrels have been present in Lincolnshire since around 1935, when they were first recorded at Folkingham and then at Leasingham. By 1937 they were also present at Quarrington, Tallington, Uffington, Belton Park, Swinethorpe Castle and Sedgebrook (Shorten, 1946.) The first record north of the Witham was at Coningsby in 1944 and at Lincoln a year later (Shorten, 1946). Occasionally white animals are recorded.

*Sciurus vulgaris*

## Red squirrel

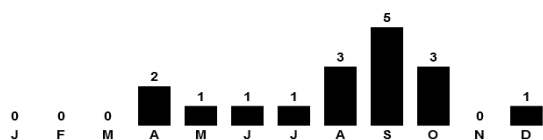
E 1907

L 2008



R 70

S 36



Once a widespread species in Lincolnshire, only a handful of records date to before the introduction of the grey squirrel. As a result it is likely the records poorly reflect the true historic distribution of the species.

The red squirrel as a native animal was last recorded in the county in 1977 with occasional reports since then unverified and probably relating to colour variations of the grey squirrel or escapees with red squirrels occasionally being kept as pets. In 2007 a photograph of a red squirrel in a garden at Rigsby marks the only recently verified record and was likely of an escaped animal.

*Arvicola amphibius*

## Water vole

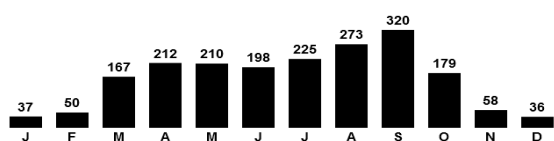
E 1906

L 2015



R 2935

S 869

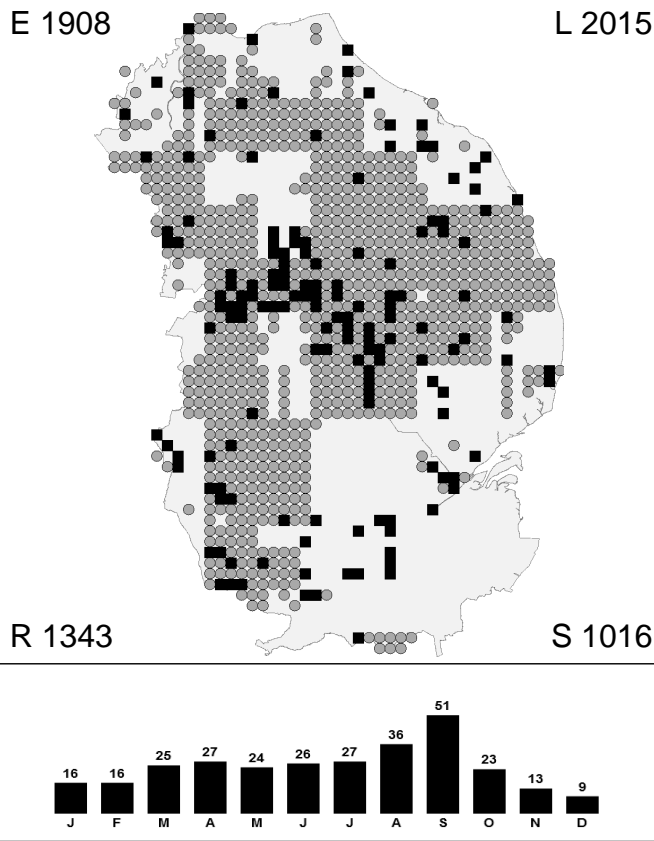


The water vole was shown as virtually absent in Lincolnshire in 2006 when Strachan & Moorhouse (2006) published the Water Vole Conservation Handbook. This conflicted with anecdotal reports that the species was abundant in Lincolnshire. Records now show the water vole to be widespread and common in Lincolnshire, particularly in the east of the county and central areas. The lack of records from other areas is likely the result of under-recording with suitable habitat being present throughout much of Lincolnshire.

Recent work on mapping water vole populations (McGuire, et al 2014) has demonstrated that Lincolnshire holds the largest key area for water voles in the country. The increased recording effort of the Internal Drainage Boards and collation of records by the Lincolnshire Environmental Records Centre has evidenced the earlier reports with the water vole undoubtedly the county's most important mammal.

*Myodes glareolus*

Bank vole

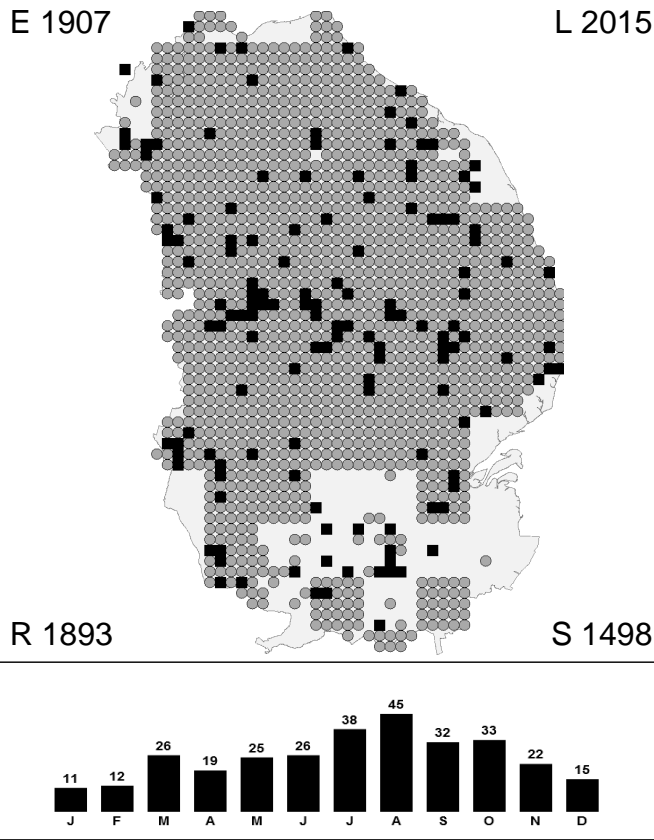


The bank vole has a restricted distribution in Lincolnshire but this is almost certainly due to under-recording with suitable habitat being present throughout the county.

In contrast to its common name, it is a species more often associated with woodland and scrub habitat.

*Microtus agrestis*

Field vole



A widespread species in Lincolnshire which is almost certainly under-recorded in the county.

The field vole is the main food source of the county's barn owls; the best evidence for the widespread distribution of this species is the large number of barn owls - Lincolnshire holding around 10% of the national breeding populations. Field vole numbers are known to be cyclical and in Lincolnshire this is most clearly noticed by the variable breeding success of barn owls.

*Apodemus flavicollis*

## Yellow-necked mouse

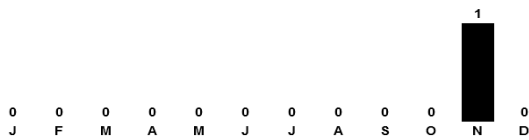
E 2009

L 2009



R 1

S 1



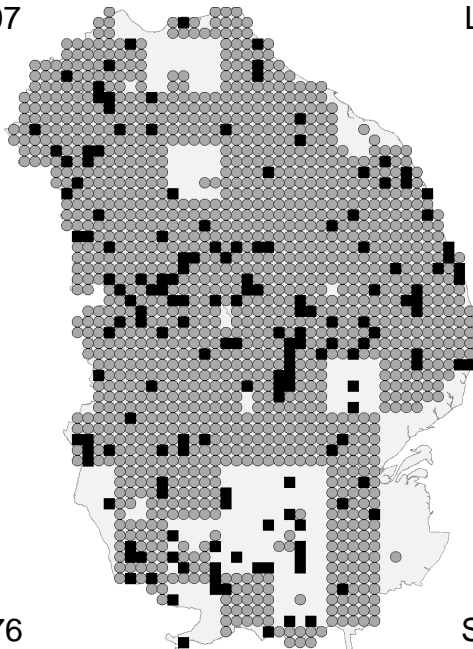
Johnson (1982) believed that this species is under-recorded in Lincolnshire with only one unverified record since. The yellow-necked mouse is easily confused with the wood mouse, but has a more southern distribution nationally. A verifiable record such as a photograph or carcase to prove that it currently occurs in Lincolnshire is awaited.

*Apodemus sylvaticus*

## Wood mouse

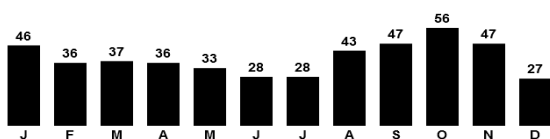
E 1907

L 2015



R 2076

S 1478

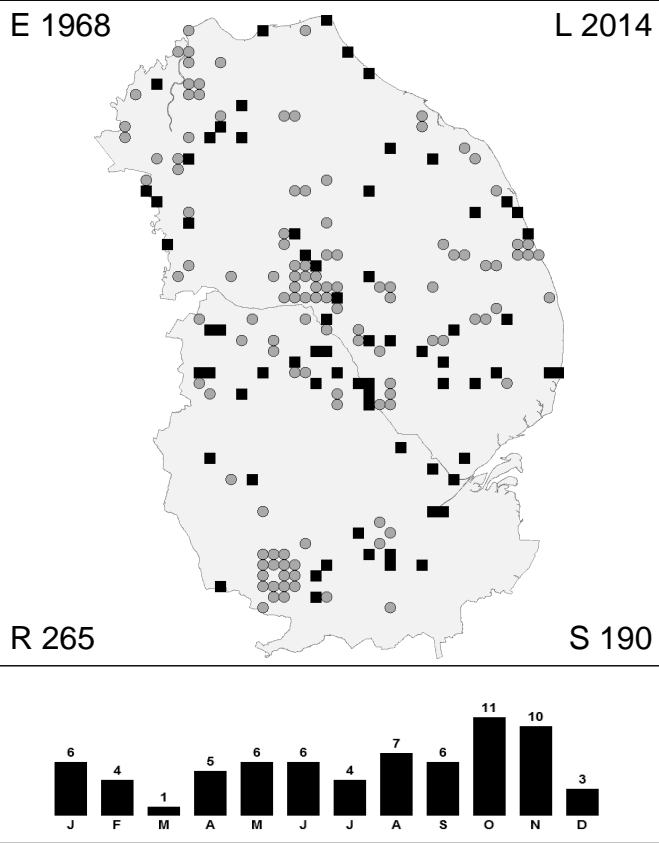


The wood mouse is another widespread species, which can be expected across the county and appears to be under-recorded.

The wood mouse is believed to be widespread across the British Isles, except the Scottish Highlands.

Micromys minutus

Harvest mouse

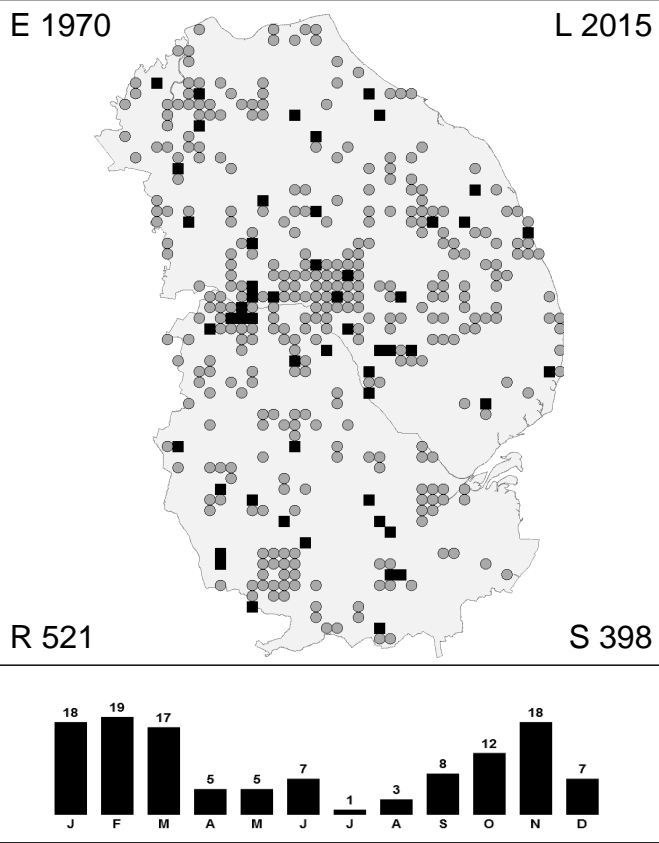


The harvest mouse was described as "rare" in Lincolnshire by Blathwayt (1912), with the next record of a skull found in a barn owl pellet from South Carlton in 1968 (Johnson, 1969). This is a species that is under-recorded in the county and almost certainly more widespread than the records suggest.

A study on Vernatt's Local Nature Reserve has shown that numbers fluctuate widely on a site where management is targeted for this species (Faulkner, 1996 & 1998).

Mus musculus

House mouse

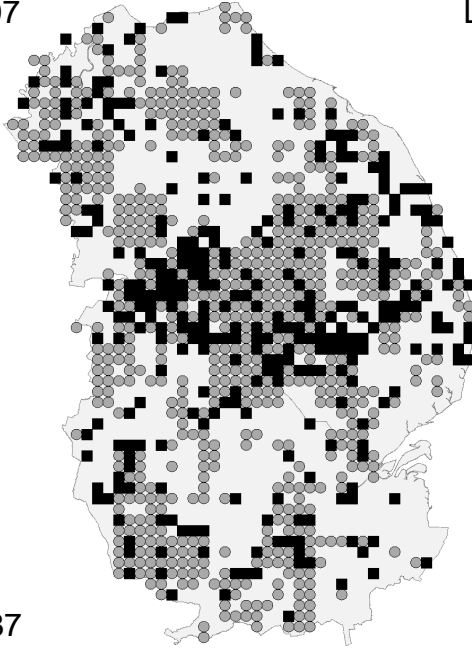


The house mouse is a ubiquitous species, and as they are so common the suspicion is that they aren't recorded diligently. Originating in Asia, the house mouse may be one of the most widely distributed mammals in the world, and has probably been present in the UK since the Viking invasion. The house mouse as its name suggests is closely associated with man and may struggle to survive away from human habitation which may account for fewer records in the less densely populated parts of the county.

***Rattus norvegicus*****Brown rat**

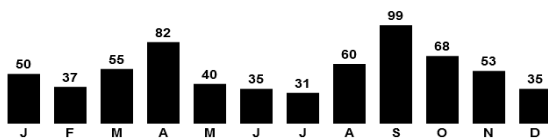
E 1907

L 2015



R 1587

S 961



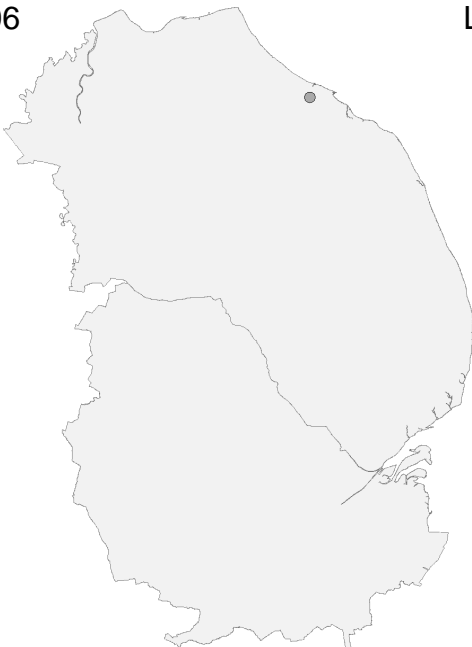
Another ubiquitous species, as with the house mouse, they aren't diligently recorded. Concentrations of records in urban areas likely reflect increased recording effort.

A non-native species, since their arrival in the 18th century they have displaced the black rat and have become widely established as they can thrive in the open countryside. The brown rat is a pest of stored foods, a vector of human diseases and a predator of birds' eggs and chicks (GWCT, 2014).

***Rattus rattus*****Black rat**

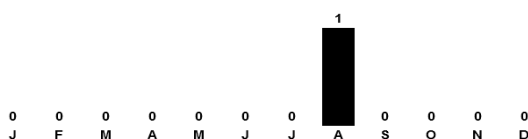
E 1906

L 1906



R 1

S 1

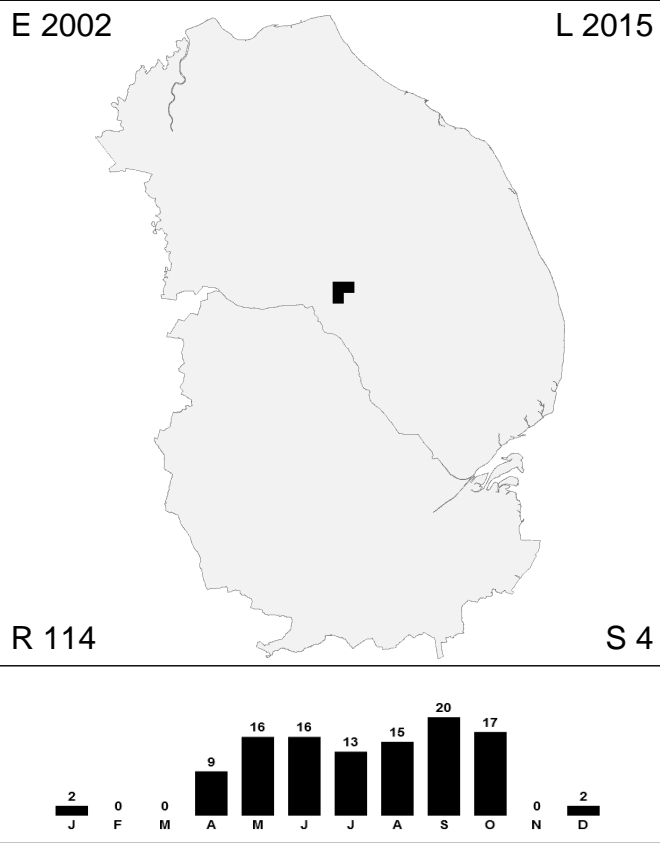


The black rat, also known as the ship rat, was perhaps introduced in the 1st century BC and was once common in England. It is notorious for spreading the Black Death. Their decline was due to the introduction in the 18th century of the larger and more aggressive brown rat.

Today they are occasionally reported from the Humber ports, where they are rapidly dealt with by the Port authorities.

Muscardinus avellanarius

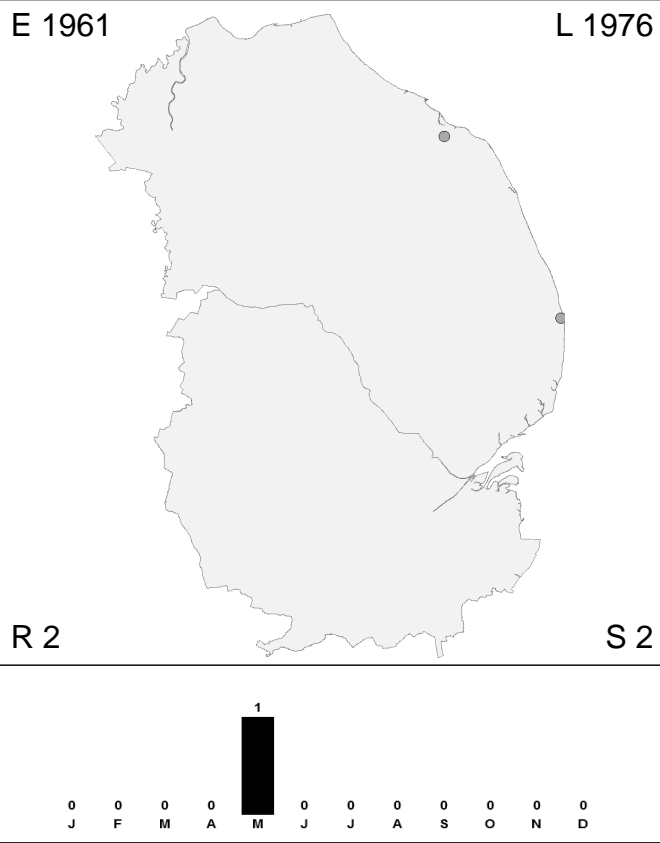
Hazel dormouse



Blaythwayt (1912) reported the presence of hazel dormouse in the Wragby Woods but apparently they were already absent in the Kesteven Woods. When the dormouse became extinct in Lincolnshire isn't known, but no confirmed reports are available since 1912. In 2002 16 pairs of hazel dormouse were reintroduced to the Bardney Limewoods NNR with careful monitoring showing the population to be thriving and their range expanding (Goodall, 2009).

Myocastor coypus

Coypu



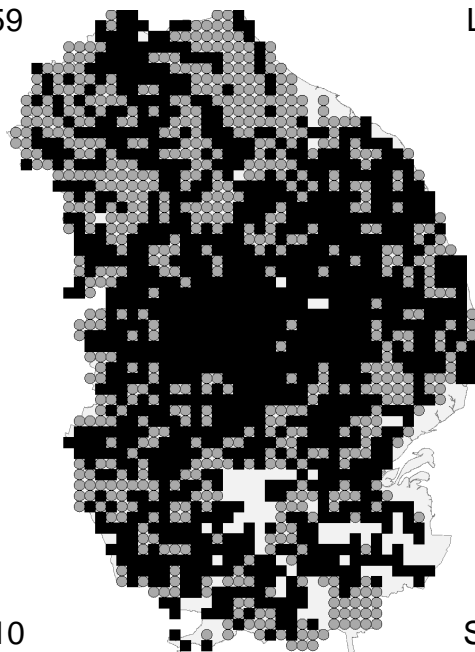
The coypu was introduced for fur farming in 1929. Breeding populations established from escapees or intentional releases caused significant damage to water courses, resulting in banks collapsing and increased sedimentation. Following two control campaigns in 1962-65 and 1981-89 (Baker, 2006) the coypu became extinct nationally in 1989. The population was based in East Anglia and may have peaked at 200,000 animals (Baker, 2006). Coypu were rarely reported in Lincolnshire.



***Lepus europaeus*****Brown hare**

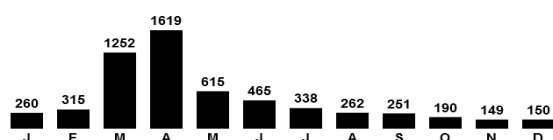
E 1859

L 2015



R 7910

S 1696



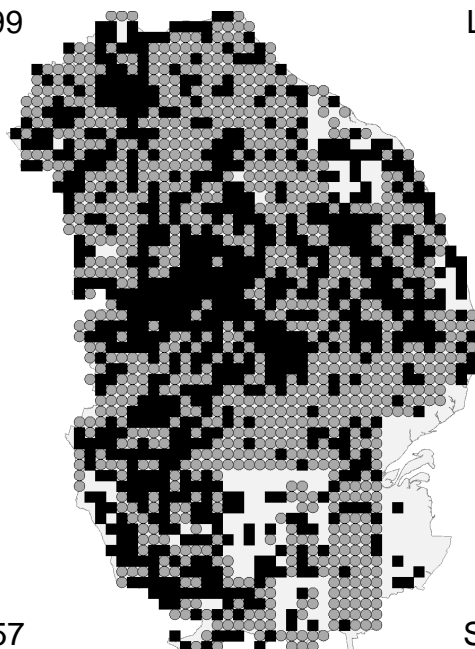
The brown hare is the most widely recorded mammal in Lincolnshire, and has a county wide distribution. Absence of records is almost certainly due to lack of recording-effort.

There has been a significant decline in the bag index between 1961 and 2009 although the trend has reversed since the 1980s (significant increase of over 50% since 1987) (GWCT, 2014). The decline phase has been linked to the reduction of agricultural diversity through intensification, and increased predation pressure as fox numbers rose. The increase phase coincides with the introduction of set-aside and agri-environment schemes that have restored some habitat diversity to farmland (GWCT, 2014).

***Oryctolagus cuniculus*****Rabbit**

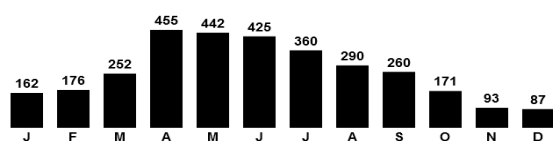
E 1899

L 2015



R 5357

S 1628



The rabbit is widely recorded throughout the county with absence of records, particularly in the Fens, likely a result of under-recording.

A non-native species, originally from the Mediterranean, the rabbit is believed to have been successfully introduced by the Normans for food and fur.

The National Gamebag Census reports a significant increase in the bag index since 1961 and 2009. Since 1996 there has been an initial significant decline followed by stabilisation that may be linked to the spread of the new rabbit viral haemorrhagic disease (GWCT) 2014.

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