

**OPERATION
WATER VOLE**



GLNP

GREATER LINCOLNSHIRE
NATURE PARTNERSHIP

A short history of mink control in Greater Lincolnshire



- 2018 Representatives from the GLNP Rivers and Wetlands BAP habitat group attend the first meeting of Waterlife Recovery East (WRE) in Thetford.
- 2020 Lincolnshire Chalk Streams Project and Lincolnshire Wildlife Trust receive funding from Anglian Water and Viking Link to trial smart traps on two chalk streams, along with carrying out water vole surveys. 8 smart traps deployed, later increased to 18, with post-project management funded by Lindsey Marsh Drainage Board.
- 2021 GLNP Mink Strategy Group established
- 2021 EA agree to fund mink control as water vole mitigation after flood works near Wainfleet, later managed by Lindsey Marsh Drainage Board (13 traps) and extended further along the Lymn/Steeping catchment - ended in 2024.
- 2021 WRE start working with IDBs in southern Lincolnshire (South Holland IDB and Welland & Deepings IDB), within their project buffer zone. IDBs pay for and manage their own traps.
- 2022 Witham 4th IDB also start working with WRE (now WRT – Waterlife Recovery Trust)
- 2022 GLNP receives funding from SSE Thermal for water vole mitigation associated with Keadby Power Station (west of Scunthorpe), with supporting funding from the Isle of Axholme and North Nottinghamshire Drainage Board. 10 smart traps deployed.

A short history of mink control in Greater Lincolnshire

- 2023 North Lincolnshire Council deploy 6 traps over two sites.
- 2023 WRT is awarded funding from the Natural England Species Recovery Programme for mink control from the Thames to Lincoln, all supported by volunteer trap hosts and managers. Environment Agency provide funding to cover the remaining areas of the Witham catchment north of Lincoln.
- 2023 GLNP receives funding from the Farming in Protected Landscapes scheme (with supporting funding from Lindsey Marsh Drainage Board) for mink control on the Lincolnshire Wolds AONB and east to the sea (Witham and Northern Becks catchments).
- 2024 Additional funding received by WRT from NE (and Ancholme IDB) to cover the Ancholme catchment.
- 2024 Funding from Lincolnshire County Council, North East Lindsey IDB and Scunthorpe and Gainsborough IDB, along with WRT equipment recovered from Norfolk, enables the rest of Greater Lincolnshire to be covered by a strategic trapping network.

October 2024 - 438 active smart traps across Greater Lincolnshire

Key to success = partnership working

Greater Lincolnshire project boundaries

Active projects

North Lincolnshire
Council sites

GLNP Keadby traps

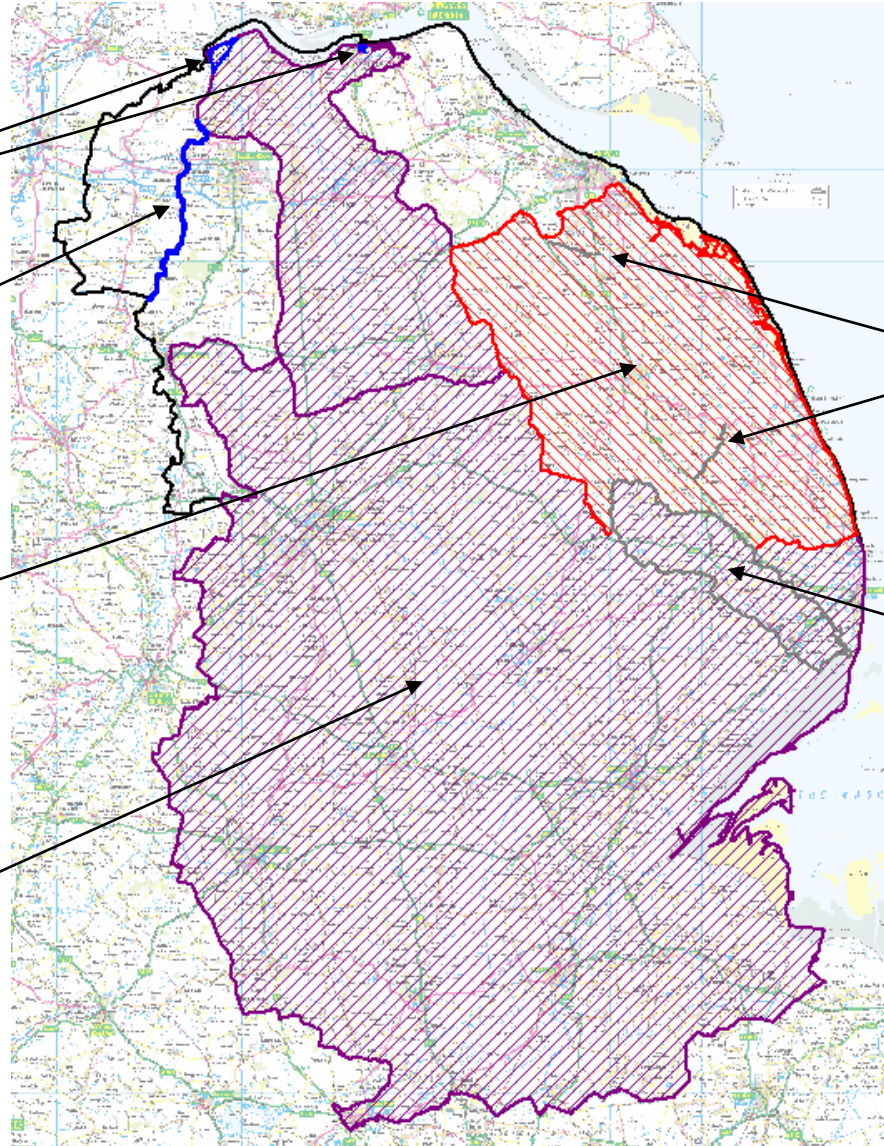
GLNP Operation Water Vole
Wolds to the Coast project

Waterlife Recovery Trust
Thames to Lincoln project,
plus Witham and Ancholme
extensions

Past projects

Chalk Streams Project
traps (Waithe Beck and
Great Eau)

Wainfleet/Steeping
flood mitigation



What has happened in Norfolk and Suffolk?

Waterlife Recovery East started in 2019 when partners from the long running East Anglian Mink and Water Vole Group joined with others from the fields of wildlife conservation, water management, game shooting and fishing. All shared the goal of bringing life back to the waterways and wetlands of East Anglia, through the removal of the highly damaging invasive, non-native American Mink.

The original WRE project had three linked objectives:

- to humanely control mink throughout East Anglia,
- to see if eradication was possible at a wide geographical scale,
- to develop and spread the use of best practice for mink control.



Waterlife
Recovery
Trust

Underpinning this was the vision that an effective model could be developed which could then be used to promote mink control, and ultimately eradication, throughout Great Britain. The Waterlife Recovery Trust was formed to help make this vision a reality by facilitating the development of a 'family' of catchment-based mink projects working throughout the country.

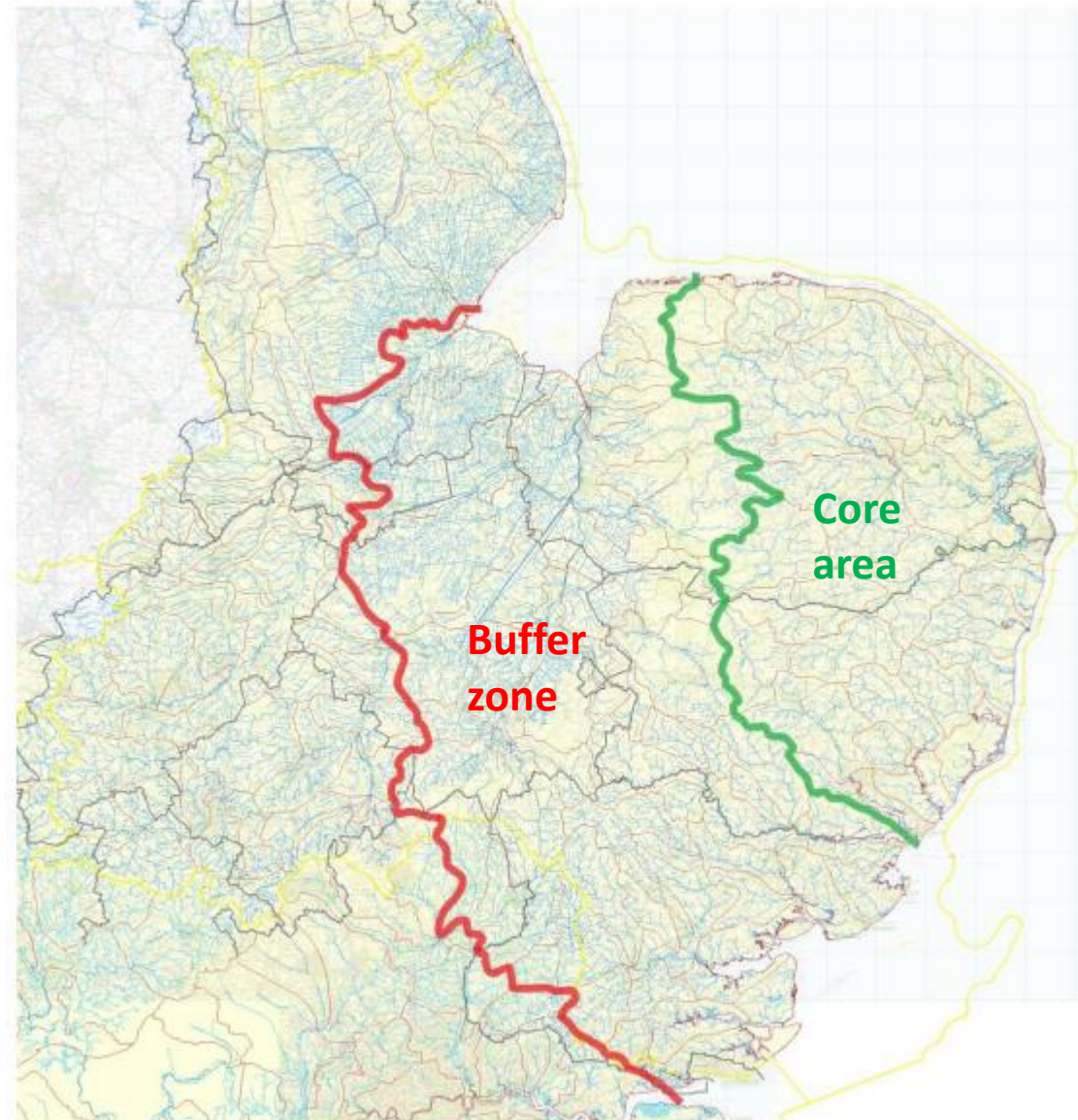
What has happened in Norfolk and Suffolk?

The project got going in 2021 with the project area comprised two adjacent and equally important geographical parts.

The **Core Area**, covering 5,853 sq km, has a marine boundary to the North and East, and is the area over which project success (i.e. mink eradication) was tested and determined.

The **Buffer Zone** covers 10,423 sq km. Its function is to prevent mink from entering the Core Area overland or via waterways from the West and South. The Buffer Zone has a minimum width of 60 km, which is just greater than the maximum natal dispersal distance recorded.

Intensive trapping took place year-round in both the Core Area and Buffer Zone.



What has happened in Norfolk and Suffolk?

Game changers:

- Remote monitoring devices
- Eau de mink scent lure
- Volunteer trap hosts/managers

Other outcomes:

- Age determination
- DNA testing
- Online database



Photo: WRT

Photo: Alex Cawley

What has happened in Norfolk and Suffolk?

Definition of success

A period of 12 months with no evidence of mink breeding within the landscape-scale project Core Area, despite substantial trapping effort and searching, would be deemed trial success.

Relevant notes:

1. A lack of breeding would inevitably lead to population extinction in the absence of immigration.
2. Removing every mink is not necessary; removing all animals of one sex will bring breeding to a halt.
3. Evidence of breeding could include the confirmed presence of young mink in a family group or the capture of one or more pregnant, lactating or post-lactating females.

This success was announced in January 2024, and reported by national media outlets.

Scientific background

The WRT operation, both their own projects and working with partners, covers 21 counties, with over a hundred frozen mink carcasses a month making their way to Cambridgeshire.

Each animal is carefully examined, measured, weighed, sexed and sampled, before teeth and tissue are sent to Cambridge University for processing, and hair samples to a collaboration involving Oxford and London Universities.

There is a wide overlap between the largest juveniles and smallest adults of both sexes, so size alone is not a good indicator of age. However, juveniles can be identified by measuring tooth wall thickness using an x-ray, and the canine teeth of adult mink contain growth rings that can be read in the same way as tree rings.

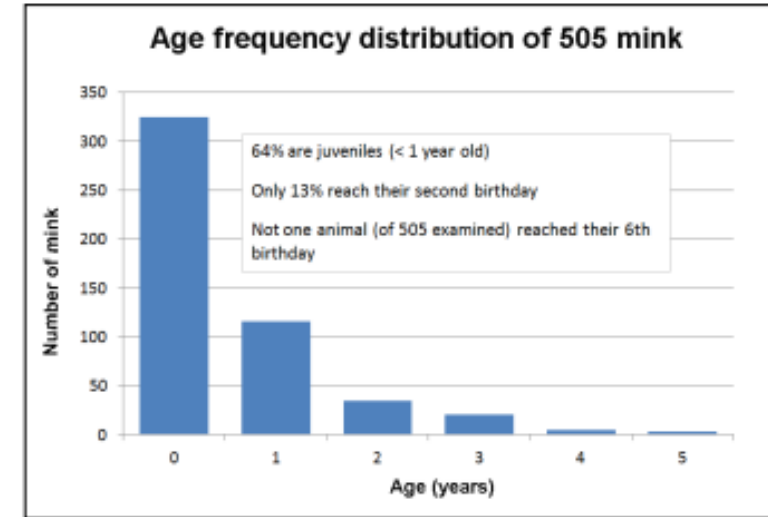


Scientific background

In order to eradicate any pest organism, its population dynamics need to be understood. For mink, some of this is well known – for example, they are most active in the spring when looking for mates, and the autumn when juveniles disperse, with the early summer being the quietest time.

Dispersal distances are being investigated via DNA testing, but little was known about how long feral mink live anywhere in the world. With the age known for over 500 mink, it can be seen that almost two-thirds of individuals don't reach their first birthday, only 13% reach their second birthday, and none were older than 5 years.

Twice as many females (18%) reach their second birthday as do males (9%) which is partly due to males being easier to catch than females (194 males v 129 females caught in their first year of life). The sex ratio in a feral mink population changes when subjected to significant trapping effort. In Norfolk, early catches were more than 90% male, and ended at just 16% male in 2023. When as many females as males are being caught, the population is on track for eradication.



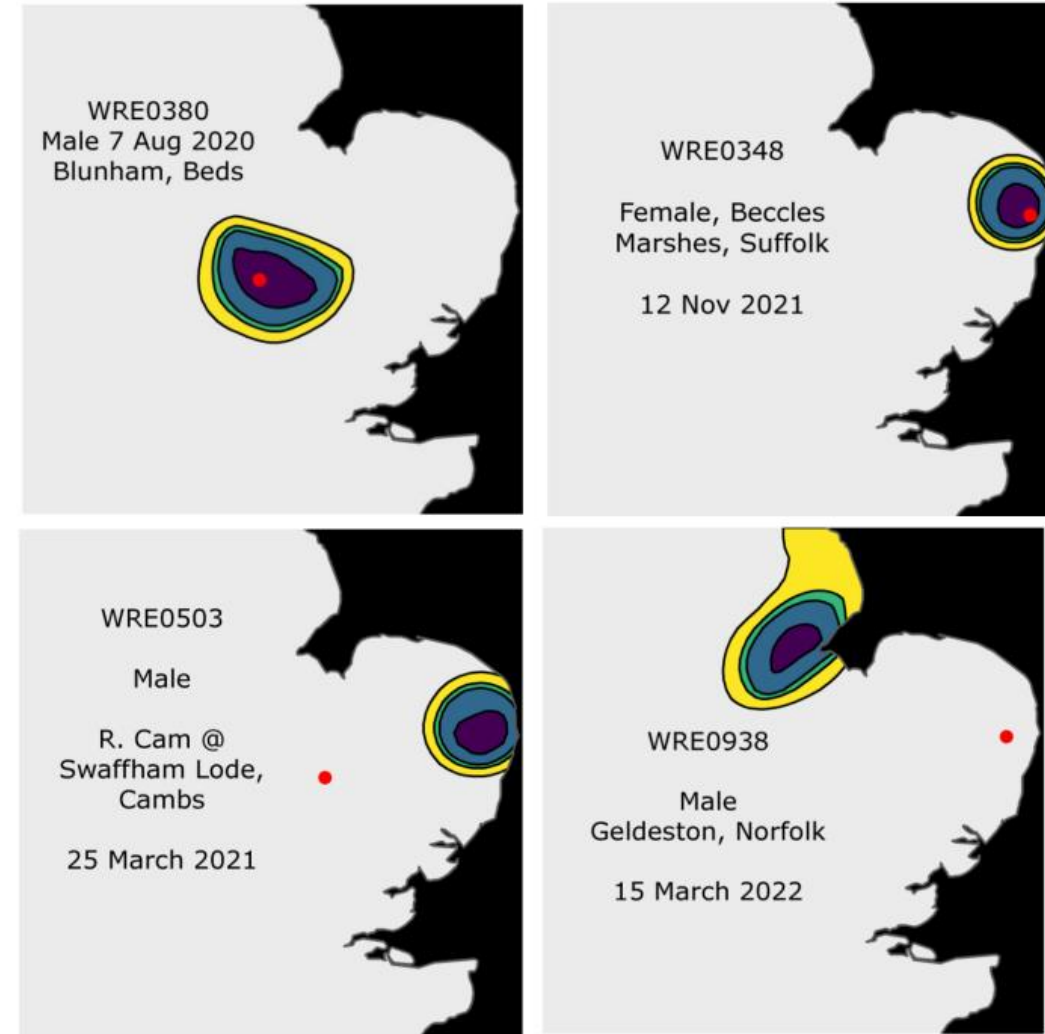
© Tony Martin

DNA testing – genetic markers

Bill Amos at the University of Cambridge started studying mink DNA from samples of individuals caught across the WRE project area.

He used different genetic markers to identify family groupings of offspring and siblings which can be used to produce a “genetic map” indicating where a particular mink is likely to have been born.

This can show how far mink travel from where they were born, and also show whether a mink was born locally or is an immigrant from a different area – essential information as part of an eradication campaign.

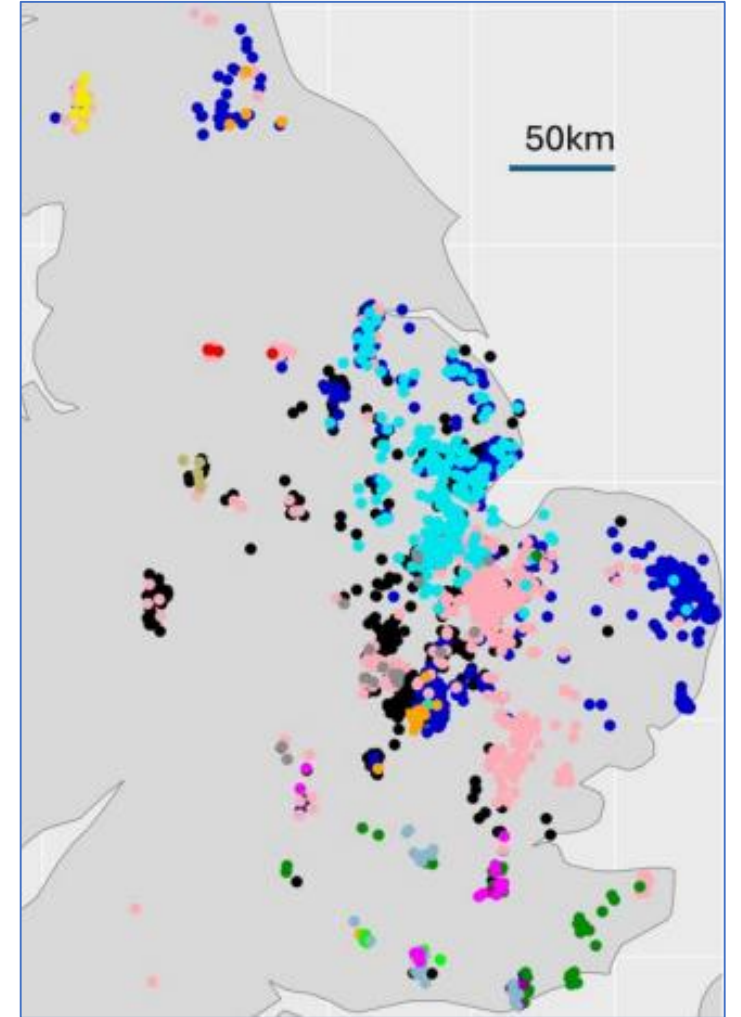


DNA testing - mitochondrial DNA types

Bill has more recently been looking at mitochondrial DNA, which is passed through the female line. He has plotted data for 1500 mink trapped across England, with each mitochondrial DNA “type” given a different colour.

This is to try to establish how often mink disperse over long distances. If animals often move over 50 km from where they were born, we would expect to see lots of bleeding between neighbouring areas, instead of neighbouring groups of dots where one group is mainly all one colour and the second group is mainly or all a different colour.

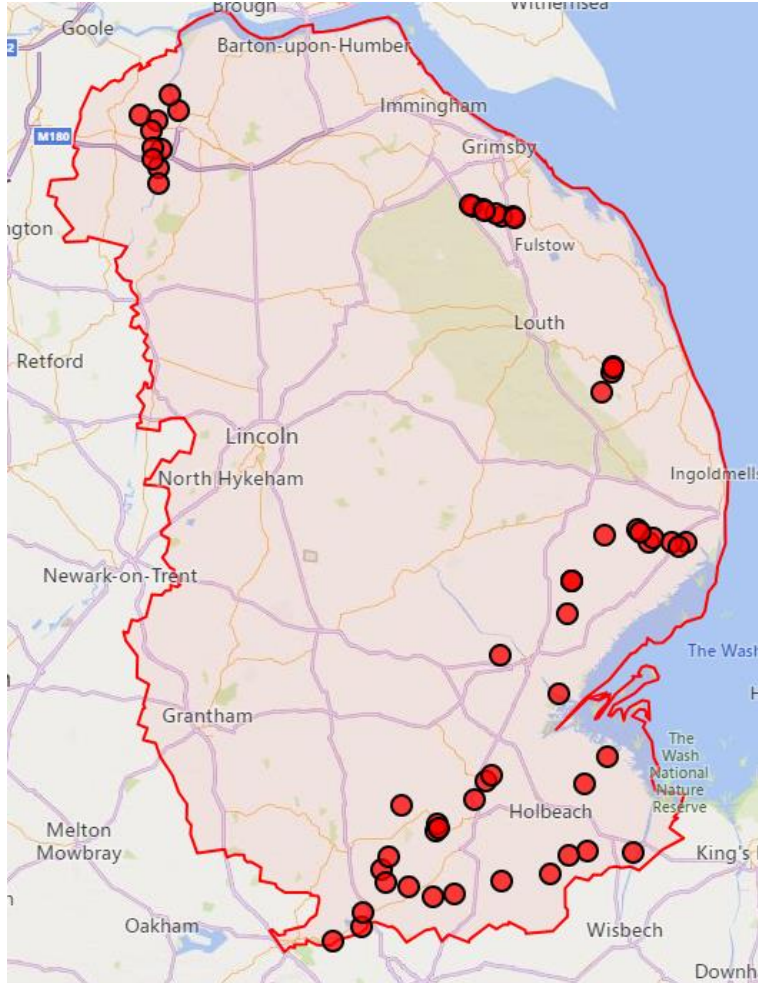
If an immigrant disperser moving from one area move to another was female, we would expect there to be more dots of their colour, which suggests these dispersers are more likely to be male. If most dispersers are males, they will only be a problem for eradication if they manage to find females.



© Bill Amos

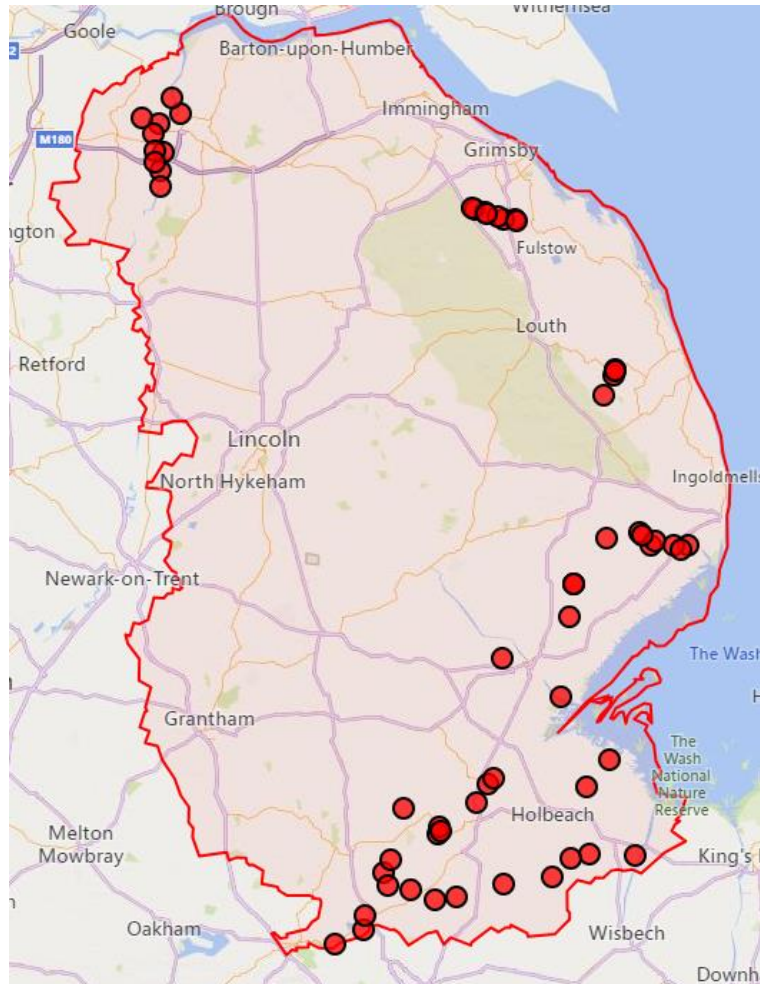
Greater Lincolnshire active traps

01 Dec 2022

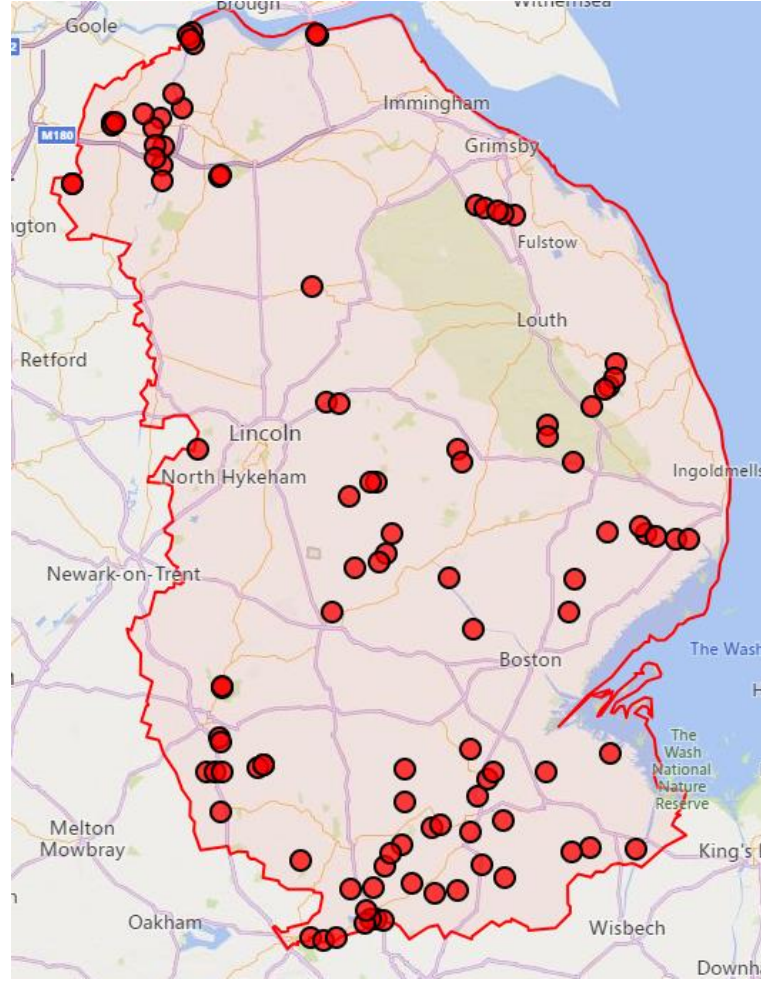


Greater Lincolnshire active traps

01 Dec 2022

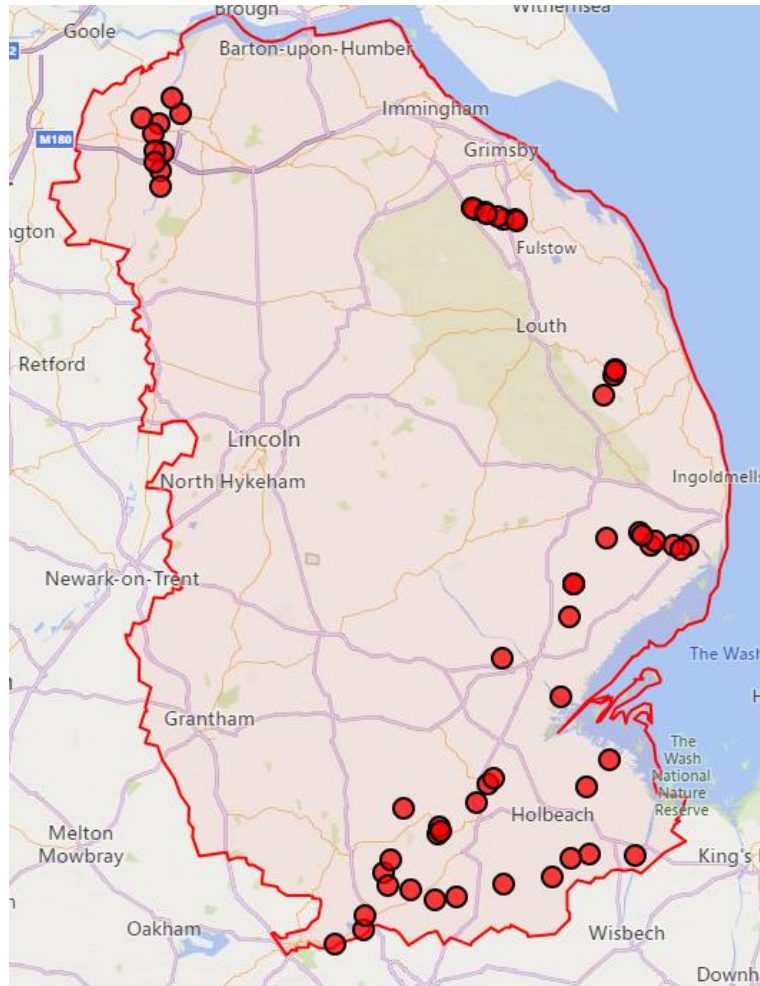


01 Dec 2023

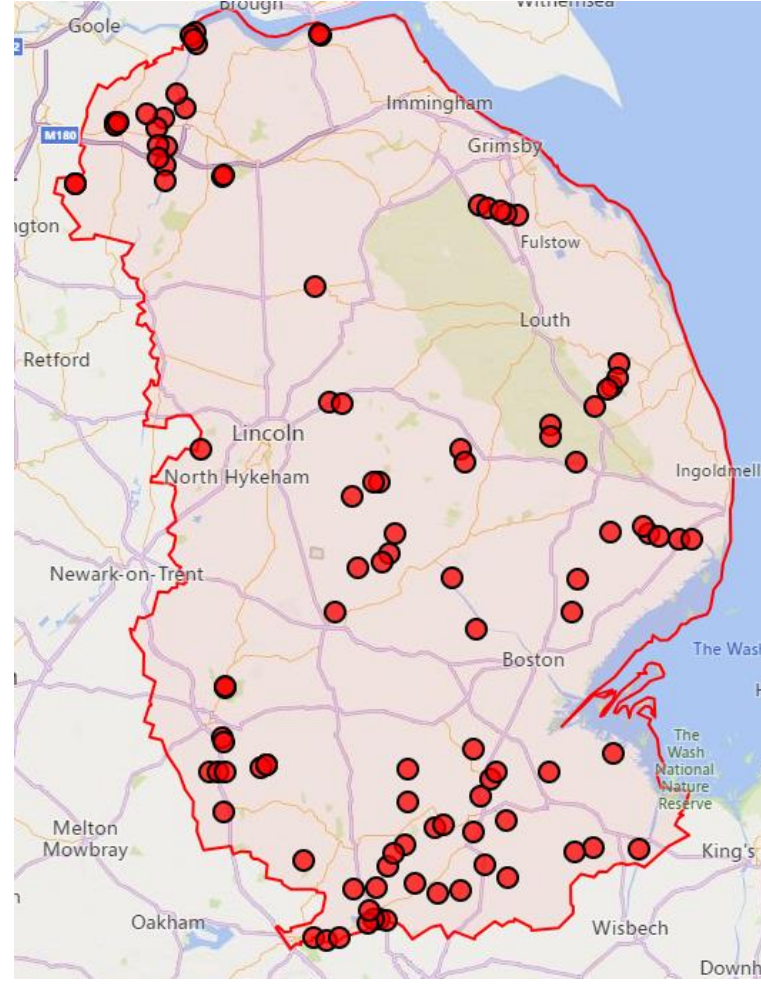


Greater Lincolnshire active traps

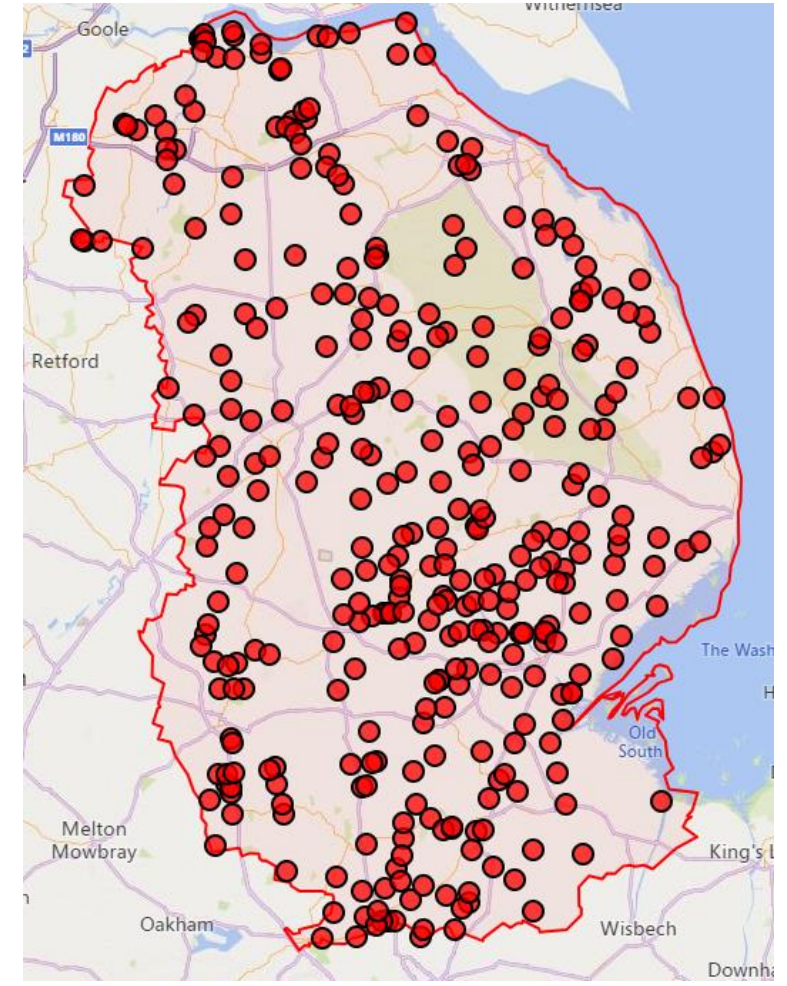
01 Dec 2022



01 Dec 2023

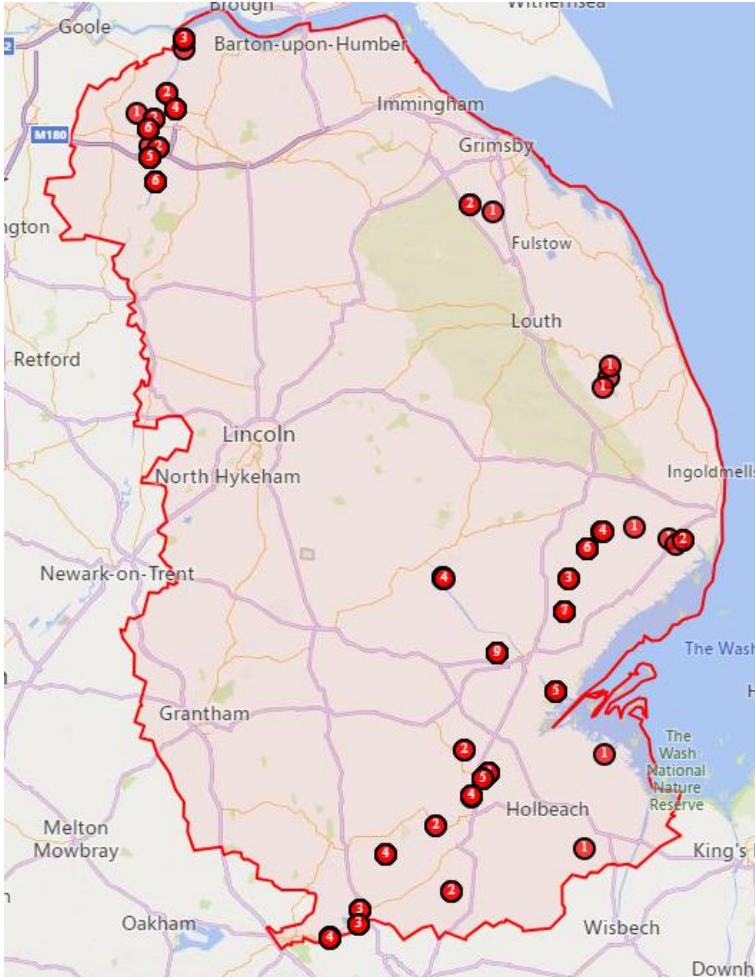


01 Oct 2024



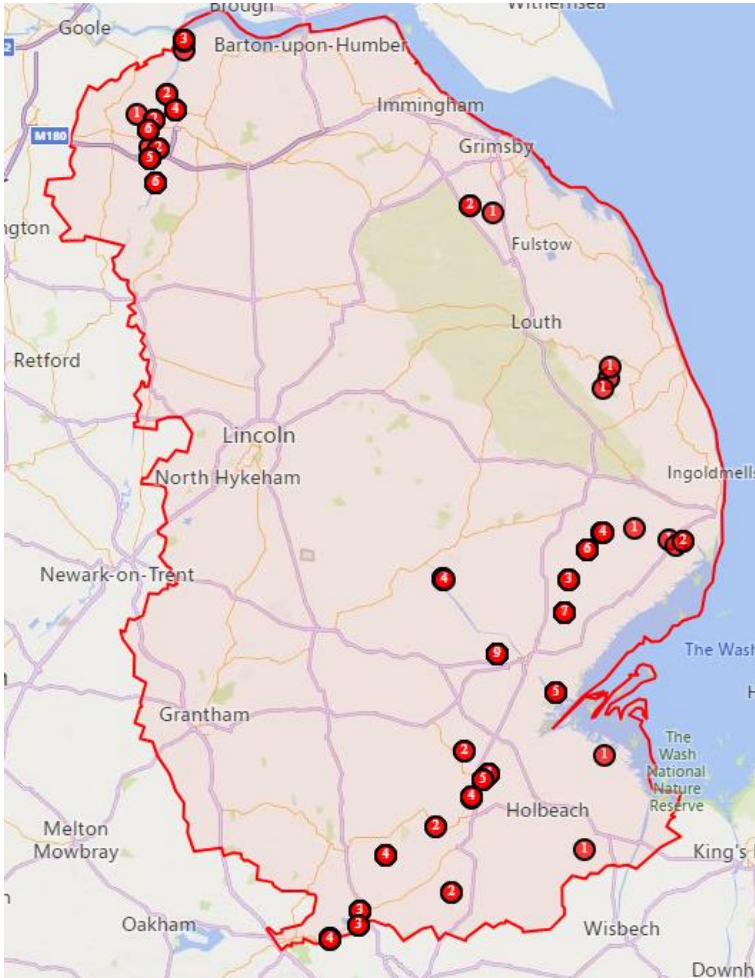
Greater Lincolnshire mink captures

01 Jul 2022 – 30 Jun 2023 (117)

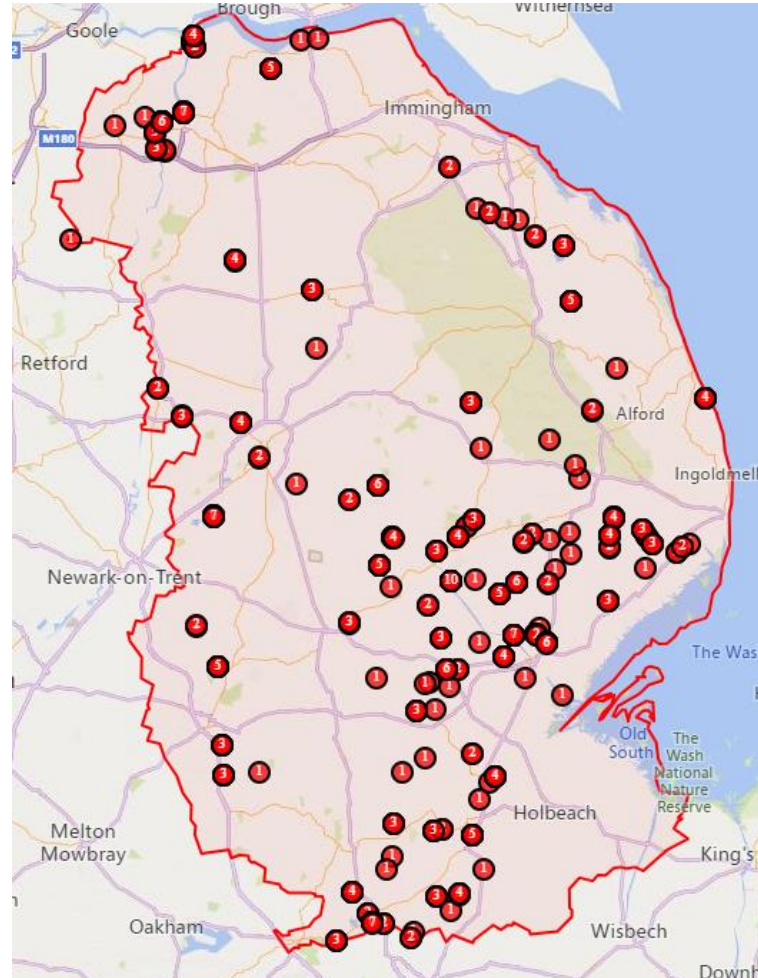


Greater Lincolnshire mink captures

01 Jul 2022 – 30 Jun 2023 (117)

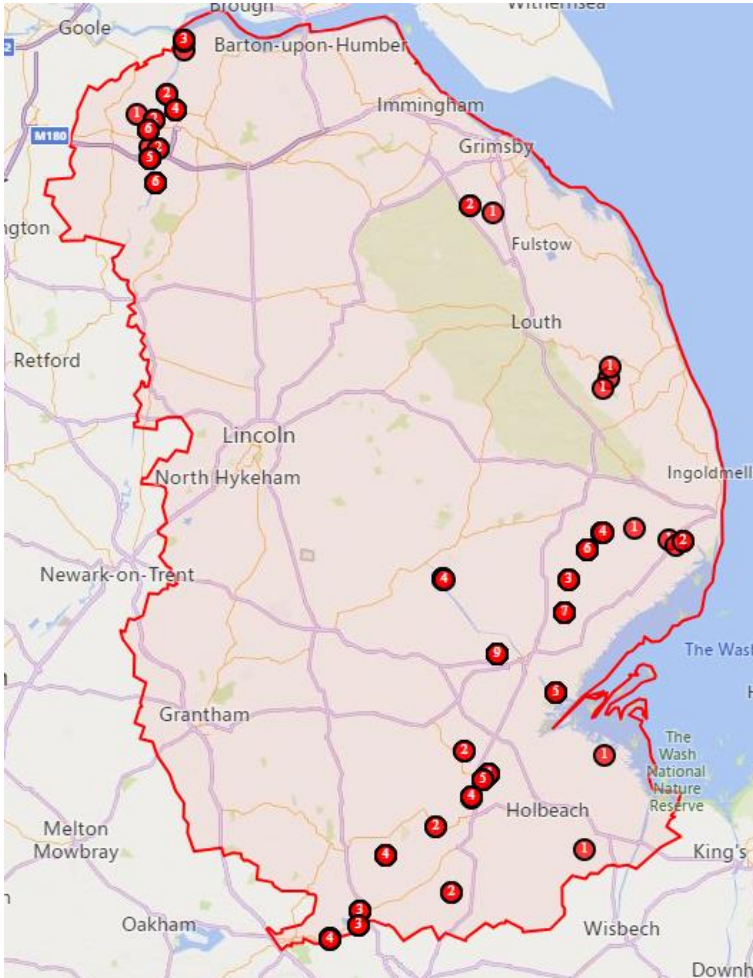


01 Jul 2023 – 30 Jun 2024 (308)

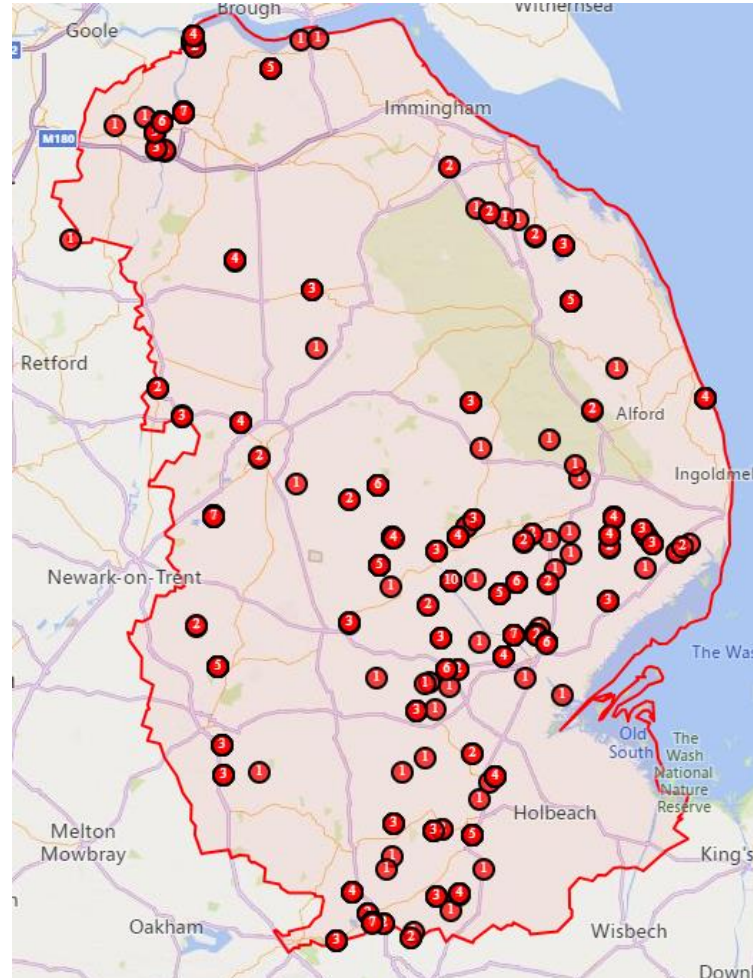


Greater Lincolnshire mink captures

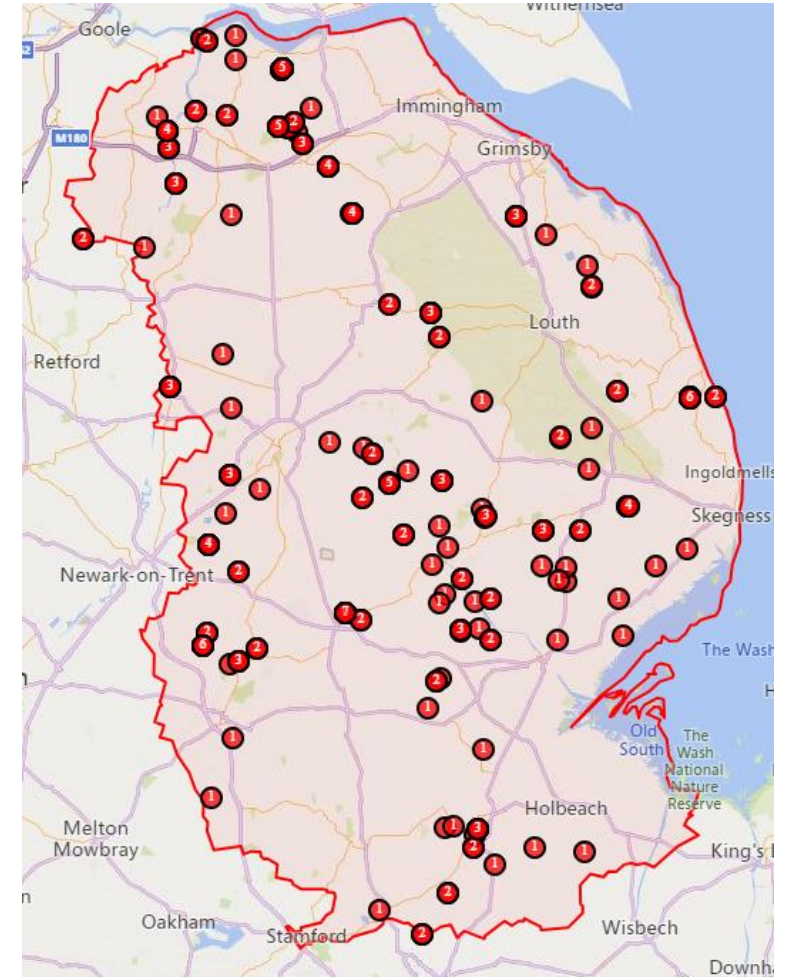
01 Jul 2022 – 30 Jun 2023 (117)



01 Jul 2023 – 30 Jun 2024 (308)

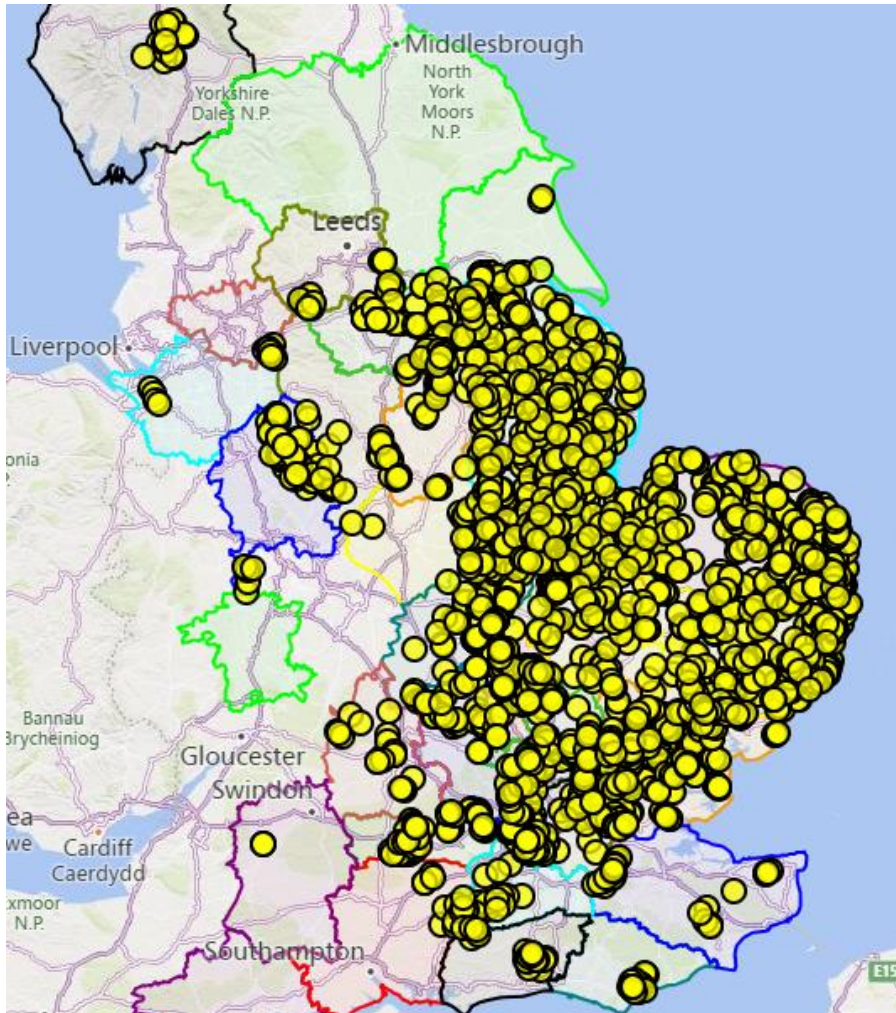


01 Jul 2024 – now (209)



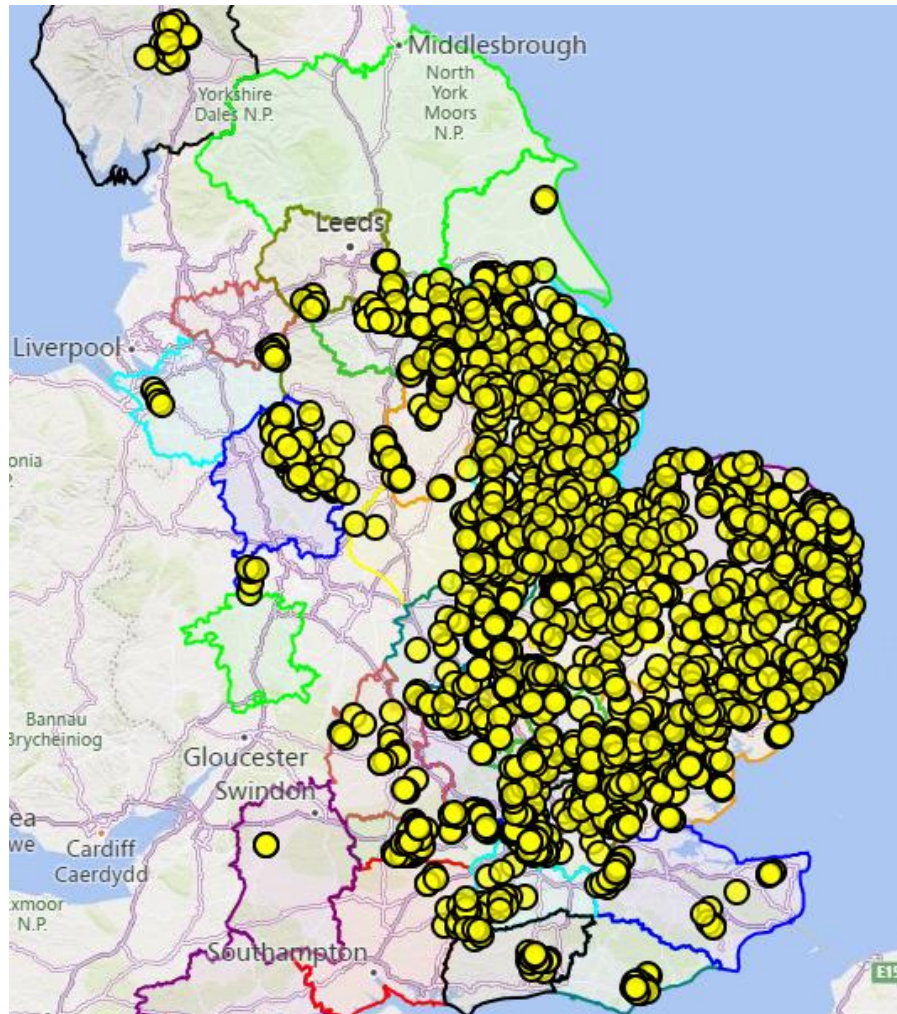
The national picture

Active traps:

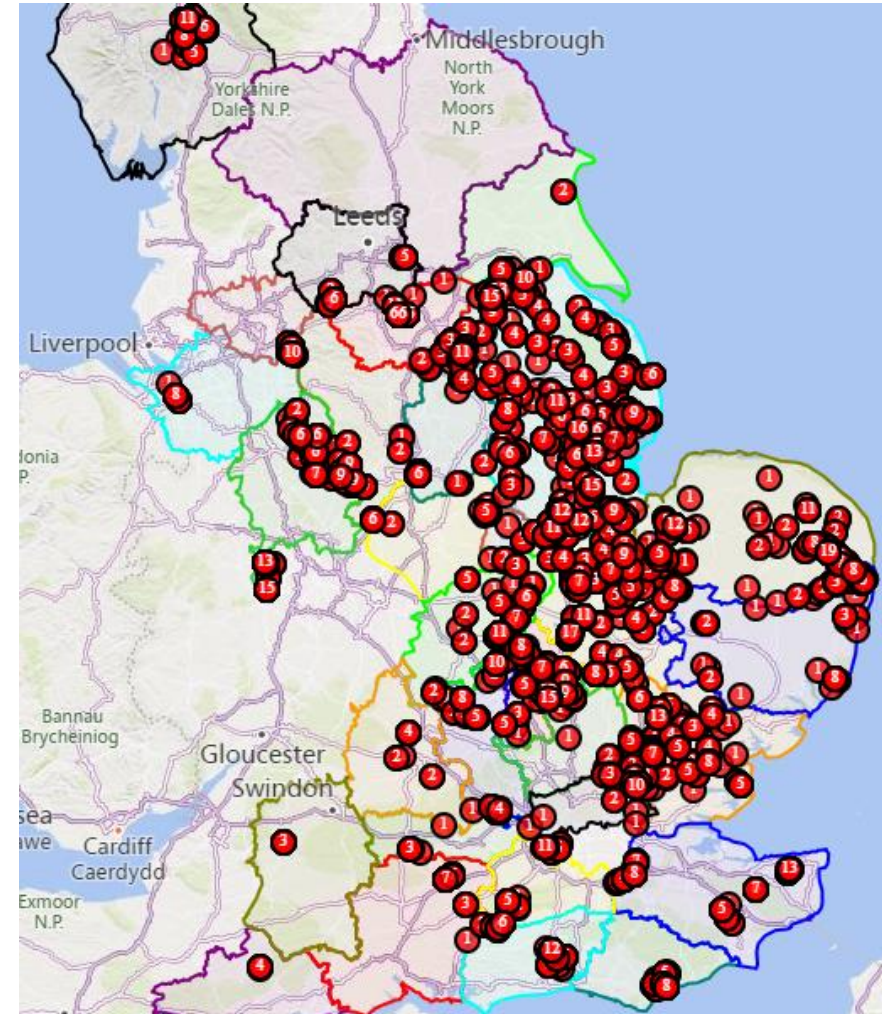


The national picture

Active traps:



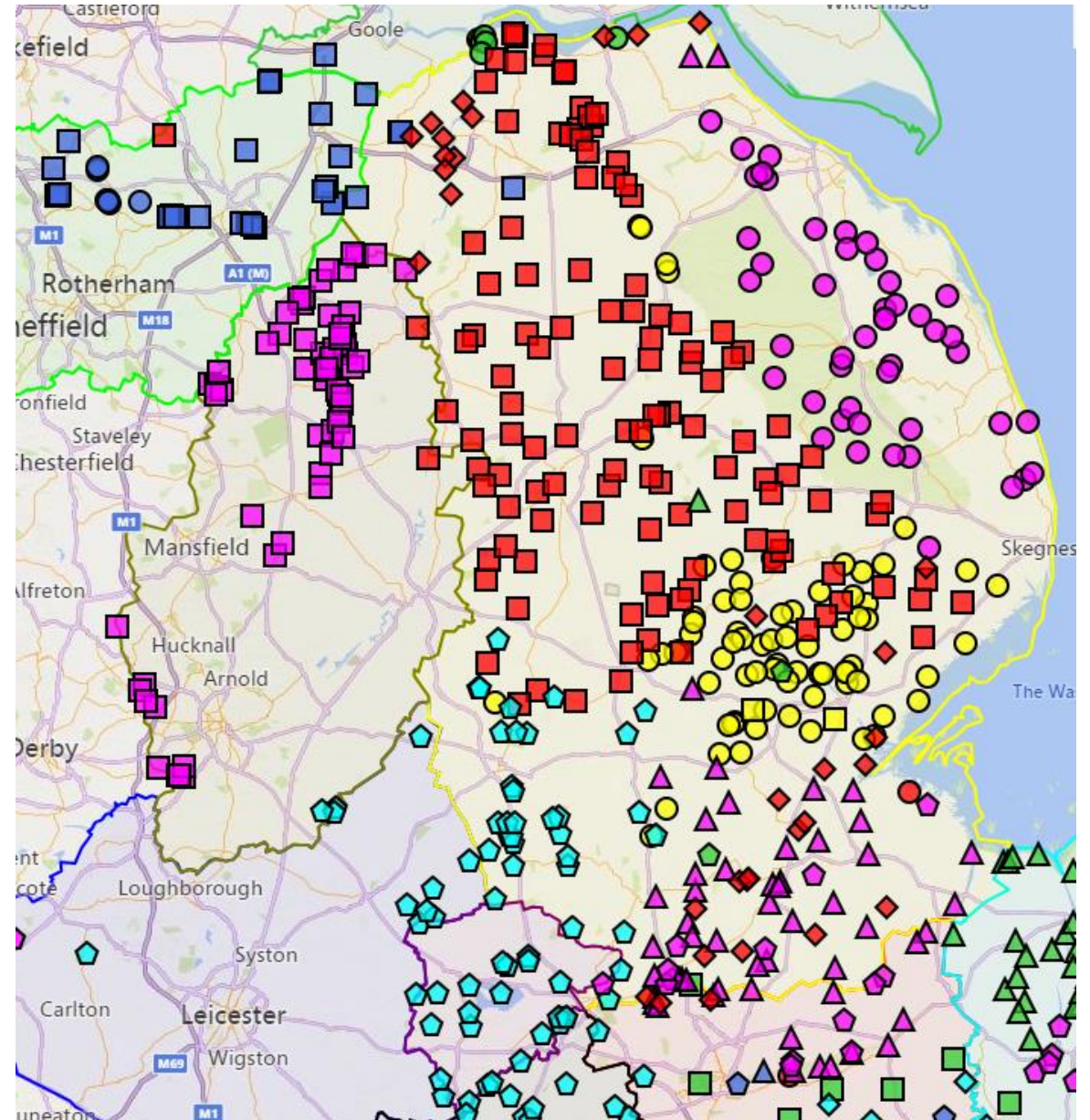
Mink captures:



Neighbouring counties

As well as the WRT project, there are mink control projects ongoing in South Yorkshire and Nottinghamshire. These all help to buffer our borders and prevent mink coming back into the county once they've been eradicated.

At the moment, there is a rather large gap along the Trent from the county boundary north of Lincoln to Nottingham...



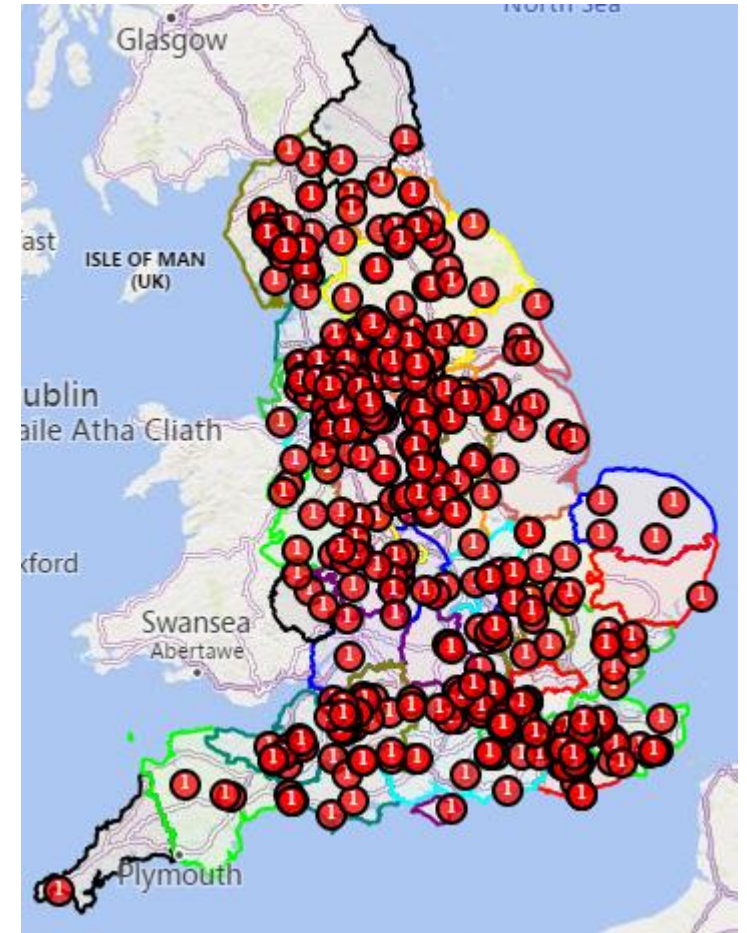
What next?

With a trapping network now in place across the whole of Greater Lincolnshire, we can expect a 70% reduction in mink numbers each year. If 500 are captured this year, we would expect that to reduce to 150 in 2025, 45 in 2026 and only 13 in 2027.

161 were captured in 2023, before the large-scale projects got off the ground.

A Waterlife Recovery South-East partnership has recently been set up, and there is interest from across the whole of Great Britain.

Tony Martin has calculated that to eradicate mink from the whole of England would cost £25 million – he has made Natural England aware of this...



Mink reported to the WRT website in 2024 by members of the public

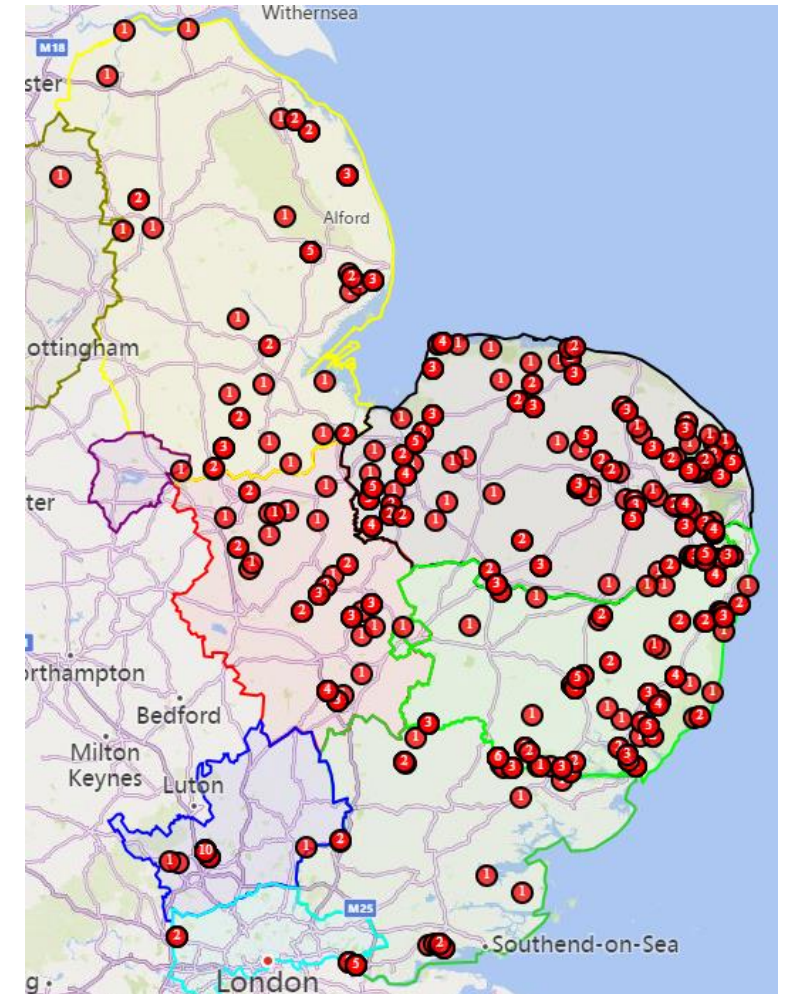
Why we're doing it

The map shows that water voles have appeared across most of Norfolk, Suffolk and Cambridgeshire – the three counties which have had the best trap coverage.

Our records show that water vole populations have also managed to hang on in Greater Lincolnshire, and they should rebound quickly once the mink have been removed.

In contrast, Hertfordshire has had few water vole captures despite a reasonable spread of traps in place over a number of years, and so most of their resident populations may have been lost.

Water vole reintroductions can work well, but it is always better to maintain local genetic diversity where possible.



Water voles caught in mink traps
since 01 Jan 2022

Why we're doing it

Water vole caught (and safely released again) by our FiPL Project Officer, Darren, on the Louth Canal, a couple of days after catching 3 mink in 5 days there!

