



# Waterlife Recovery East

## a mink-free East Anglia

NEWSLETTER 3: Dec 2021

### Rapid progress in all areas

Such is the rate of progress these days that it's easy to forget how far this project has advanced in 2021 alone. A year ago we had a perilously small budget, no WRE staff as such and a patchy distribution of rafts, of which relatively few were of the 'smart' variety. Prof. Bill had not started his genetics wizardry, we had done no population modelling work and there were few signs of our initiative generating much interest at national level. Today, all this has changed. The Green Recovery Challenge Fund award allowed us to recruit staff through WRE partners, and they, alongside partner organisations and an army of volunteers, have been working hard to deploy smart rafts across the region. As we approach the end of the year, more than 500 smart mink rafts are active, Bill's work has hugely improved our understanding of East Anglian mink, and a combination of his analyses and some independent mathematical modelling has given us a much better idea of how many mink remain. Expressions of interest from Government in recent months hold the prospect of big things to come, and meanwhile, by welcoming the Greater Lincolnshire Nature Partnership into the WRE family, our project has now grown to include all of that large county, extending our coverage to 20% of England by area. We have come a long way in a remarkably short period of time.



Phil Burt Photography

*Don't ever doubt the bravery of our adversary. This is a summer 2021 image of what is probably a juvenile mink risking everything to tackle a heron. The heron escaped, as did the mink. Most juvenile mink die before they reach their 1st birthday. No wonder!*

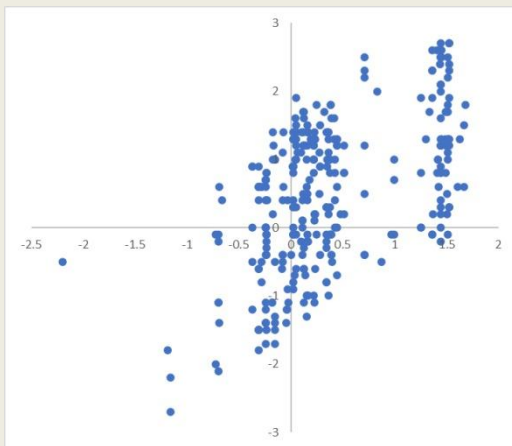
In this newsletter we hear from Prof. Bill on his progress to date, and from several counties, including Cambridgeshire, whose native wildlife has benefitted hugely from the roll-out of smart traps in 2021. Over 130 mink have been removed from the county so far this year - two and a half times the number in 2020 - and consequently water voles have had a great year, ironically causing us a lot of work by being caught in our traps and requiring visits to release them. Some return night after night, and we're actively testing cunning trap modifications to keep them out. But what a nice problem to be faced with!

## Genetics news from Prof. Bill Amos

Since the last update, increased trapping effort has resulted in a bumper crop, and we now have another 100 samples extracted and partially analysed, making 400 in total. Some good news is that my trials in developing a cost-cutting approach were extremely successful. The data I presented last time cost about £5 per animal. My new method allows me to analyse 200 animals for just £40!!

There have been three main developments recently, and some intriguing insights have emerged. First, among the most recent batch of samples were those from 11 fetuses from a female captured on the Ouse Washes in Cambs on May 2nd, and I've discovered with some surprise that all were sired by the same male. Female mink often mate with multiple males, and siblings may have two or more fathers, so for this huge brood to have just one may well be a product of the trapping successes in this county (see below).

Secondly, I have developed a method for estimating where an unknown animal comes from. If you go into a pub and meet 4 unrelated people called Williams and 3 called Jones out of 20 drinkers, there is a fair



chance you are in Wales! Surname frequency tells you quite a lot about which part of the country you are in. Genetic traits can be used like surnames, and each mink carries many tens of them! I have used these traits to construct a genetic map of East Anglia within which any mink can be placed. The graph shows how well this works: a clear positive (diagonal) relationship exists between the latitude at which an animal was caught and the estimated latitude based on information from all other mink (results for longitude are similar). The average accuracy is about 100 miles, but this should improve as more data are collected, and mitochondrial DNA (in effect a surname passed down the mother's line) can often provide

additional guidance on origin. We can use all this info to infer where immigrants likely came from or, with the Ouse Washes brood mentioned above, where the father likely came from (we can infer the genetic traits of the father from the fetuses and their mother, even though he has not yet been sampled).

Thirdly, I have now got an excellent project student working to analyse the genetic data. He is using a flexible simulation program to generate data that can be compared with the real thing. He can vary litter size, longevity, dispersal distances, local population sizes, age-specific mortality rates and more. The idea is that we try to find the closest match between the real and simulated data; because we now have so many samples, this should reflect what the real population is like. In short, this means we should be able to use the real genetic data to estimate key aspects of mink biology. After running his first few simulations his first comment was 'but full siblings are supposed to be extremely rare'. Indeed!! The only way to explain the large number of full-sibling pairs we are finding is if the local population sizes are very small and, perhaps, if siblings tend to disperse together, making them more likely to be caught in the same area. Only simulations that include these elements will match the real data and related arguments can be made for other aspects.

And, finally, a request to those who kindly send me genetic samples (usually, and preferably, ear tips) from mink they catch. To avoid any risk of confusion among the many samples now arriving, please ensure that each tube is clearly labelled with your name and the date of capture of that animal. On a separate piece of paper (or email) please advise me of the name and gridref (or lat and lon) of each capture site. I can supply tubes on request (wa100@cam.ac.uk). Samples should be sent to my attention at Zoology Dept, Downing Street, Cambridge CB2 3EJ. Many thanks.

## News from around the region

The occurrence of recent mink catches may look chaotic at first glance, with high and low numbers in different areas over the same period, sudden surges here and there, deafening silence from some places that were extremely busy just a year ago. But, with ever-growing experience, the chaos resolves into a number of predictable, overlapping patterns. Underlying everything is an annual cycle, with peak catches in early spring and later summer. On top of that is the length of time that traps have been active in any area - more history, fewer mink. On top of that are the activities of particularly energetic volunteers and staff, deploying large numbers of rafts in particular areas, and to cap it all we now see the impact of the use of fresh anal gland lures - an elixir of almost magnetic attraction to mink of both sexes. We commence this time with **Cambridgeshire**, where catches in the northeast are now few because of the work of the Fenland partnership over the past two years, but where the deployment of traps in the rest of the county this year has produced record numbers of mink. Vince Lea of the Countryside Restoration Trust takes up the story:

*As we near the end of the first full year of county-wide mink trapping operations, it's good to take stock of the situation and progress made here in Cambridgeshire, where Emily Coleman and I have responsibility for rolling out the mink trapping operation with the Green Recovery Challenge Funded project for WRE.*



*These footprints tell a story - one that ended rather better for the local Cambs wildlife than for the mink that made them; late Nov 2021.*

*Over the last 15 years or so there have been patchy operations on various nature reserves, 'keepered estates, and a couple of larger-scale operations, starting with the Middle Level drainage board which Cliff Carson got going. In 2010 I started an operation with the Countryside Restoration Trust on the Bourn Brook, which grew to include all the Upper Cam Valley and beyond. Cliff introduced me to other mink trappers in*



*Trap shy? This mink at a reserve in W Cambs was seen on camera many times but was reluctant to enter a trap (as here), until someone discovered that it had a weakness for sardines in brine.....*

*East Anglia and provided me with spare kit from his well-funded operation which struggled to recruit enough volunteers to supervise the many traditional traps he had acquired. The Middle Level is one of the biggest areas of mink habitat in Cambridgeshire (and spans into Norfolk), with 190km of large waterway in 690 km<sup>2</sup> of flat fenland. Relatively few people live here, it is mainly farmland with some major nature reserves, bounded to the east by the Ouse Washes and to the north by the Nene Washes, with Woodwalton Fen and Holme Fen in the west; these two large National Nature Reserves are being 'merged' into one huge wilderness known as The Great Fen. There was no chance of eradicating mink from this area with traditional traps when Cliff started but now that we have smart traps, it has become possible and has been one of the most productive areas*

in 2021, with 50 traps keeping us very busy, particularly Cliff himself who in his retirement is now an extremely active volunteer for this project. In the Upper Cam I have previously been using a very small number of Smart Traps strategically to reduce the mink population sufficiently for Water Voles to recover. Now that enough resources allow a fuller deployment of traps we have, as far as we can tell, restricted mink from breeding in this area of south Cambridgeshire. Meanwhile Prof Tony Martin has been building a strong network of smart rafts across the east of the county and bordering areas of Norfolk, and this network continues to protect that area.

In addition to the much-increased efforts in the Middle Level, which is the centre of the county, we have instigated efforts in the west on the Great Ouse and Nene rivers, and have expanded north to the Lincolnshire border, with a concerted effort from drainage boards in that district meaning that both sides of the border have a new and well-spaced network of smart rafts. The biggest catch of mink has been in the Middle Level, with 62 mink caught this year, followed by the gravel pits along the Ouse in Huntingdonshire which have produced 31 mink, and the North Level where 16 have been caught (plus more from the Lincolnshire side of the border). The Upper Cam has produced 11 mink and indications are that no mink bred in this area for the first time. Eight other mink have been caught in more widely scattered locations across Cambridgeshire, bringing the county total to 131 at the time of writing (28 Nov 2021).



Contrary to what you may be assuming, Cambridgeshire's Project Officer Emily Coleman is not phoning home - she is using the What Three Words app to find the exact location of a newly-deployed raft. Accurate to 3 metres anywhere in the world, this sci-fi facility is now used routinely by WRE.

And now to **Suffolk**, with news courtesy of Project Officer Alice Wickman. Since the start of the Waterlife Recovery East Project, over 80 new smart rafts have been deployed across the county. Some have been deployed at new sites and others at sites that have been trapping mink for years, their old-style plywood rafts swapped for a much-needed upgrade. However, despite the increased number of mink rafts, they saw little action during the spring and summer with most trap activations producing a by catch of mallards, moorhens, and some water voles. It wasn't until the late summer and autumn - the post-natal dispersal period for juveniles - that these new rafts saw a flurry of action.

	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>
Stour	17	11	35	59	9
Lark	9	4	0	0	6
Little Ouse	11	15	11	7	7
Gipping	4	9	14	2	1
Deben/Fynn	4	1	0	0	0
Alde/Ore	4	1	4	0	1
Blyth	0	0	1	5	3
Waveney/Dove	12	14	38	39	31
Dunwich					1
<b>Total:</b>	<b>61</b>	<b>55</b>	<b>103</b>	<b>112</b>	<b>59</b>

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The number of mink caught in Suffolk so far this year is 24, which is significantly lower than the neighbouring counties of Norfolk and Cambridgeshire. This is likely due to the long history of trapping in Suffolk and the extensive network of fantastic volunteers that have been trapping for over 20 years in some cases. However, more

curiously the number of mink caught in Suffolk this year is also down significantly from the numbers caught in previous years (see Table). Since the new smart rafts have resulted in an increase in trapping effort across Suffolk, this at first seemed strange. However, a large proportion of the earlier catches came from the River Waveney catchment, which borders Norfolk. As the WRE Project has also resulted in the network of mink rafts in Norfolk expanding, it is plausible that the new rafts north of the border have been catching mink that would have otherwise made their way down to Suffolk.

And on to **Norfolk**, where Project Officer Stephen Mace has been deploying new rafts at pace, and now has almost 200 smart traps in his network, most of them in the east of the county. A further 50 are active in the west (Fenland network), and all of Norfolk's main waterways now have at least some mink trapping coverage. Most recent catches have been in the Yare catchment, southeast of Norwich, and along the River Nar in the west of the county, the latter being a real mink hotspot. A newly recruited volunteer near Welney quickly saw some action in one of his traps, picking up a large adult male that responded to the scent lure within. We will soon know if this animal left his genes in any of the other mink we've captured on and near the Ouse Washes. Roadkills account for quite a few mink in Norfolk, and one met its end at a supermarket car park! Every one is picked up by WRE staff or volunteers so we can learn from it (age, size, gender, DNA) but despite this, and despite the greatly enhanced catch effort in Norfolk this year, the total number of mink accounted for will be very close to the total for 2020. All the signs are that mink have been vanquished in most of Norfolk, and that Stephen and his colleagues Rory, Max and new recruit Karl, will need to adapt their strategy to finding and dealing with increasingly isolated mink.



*New dowel, please. Rats are commonly caught in our traps, and often they show their displeasure by gnawing the wire. Somehow, a rat managed to do this to the otter excluder from within the cage!*



*A typical smart raft placement on a Fenland main drain. Mink (and otters) love these sites.*

As yet, deployments of smart traps in **Essex** are few, but momentum is gathering pace and mink from this county are now adding to our understanding of the genetic makeup of the regional population. Two rafts deployed by a volunteer who farms beside the delightful River Pant at Little Sampford produced an important adult female mink in September, and two more were removed from the River Chelmer by two volunteer river wardens, soon after taking delivery of their new rafts. In the south of the county, native wildlife in nature reserves bordering the Thames have suffered substantial mortality from mink in recent years, but trapping is now turning the tide, thanks to the dedicated work of the wardens.

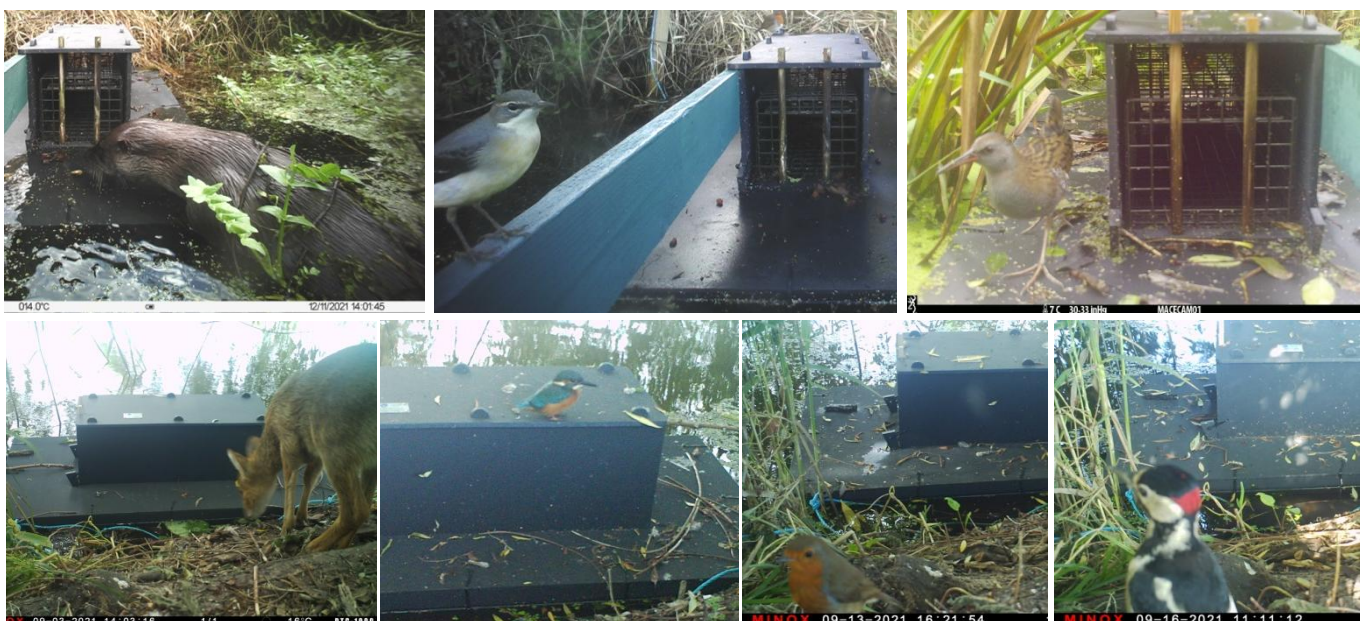
Because of pioneering Internal Drainage Boards (IDBs) in southeast **Lincolnshire** seeking to help native wildlife reclaim their waterways from a dense population of mink, trapping in the Fens immediately north of Cambs and west of Norfolk has been hugely successful over the past 18 months. First the South Holland IDB, then their Welland and Deepings neighbours, bought and deployed 10 smart rafts each, quickly realising just how many mink their drains held. After a very busy latter half of 2020, catches in South Holland dwindled as the resident mink were progressively removed, but then the Welland and Deepings team got into their stride, repeatedly filling their freezer with mink that I periodically collect, examine and sample. A volunteer looking after five rafts on smaller drains in the same area has not encountered any mink, however. This may seem disappointing but, if the situation persists for another few months, the lack of catches will be extremely helpful in allowing us to better understand where mink prefer to forage and breed, and therefore where trap effort should be focused both here and elsewhere in the Fens. With the Greater Lincolnshire Nature Partnership now part of the WRE family, we look forward to seeing this fine work in the southeast of the county soon being extended northwards, where we know mink to be abundant and where, therefore, water voles and kingfishers must be in desperate need of help.

Mink trapping in **Bedfordshire** is mostly confined to the east of the county, but 14 animals have been caught this year, and we are beginning to learn about the population from DNA samples. At the end of November, one volunteer discovered that two mink had killed and cached 13 chickens and waterfowl in his fenced enclosure close to the Gt Ouse within a few hours, reminding us all just how destructive this predator can be. And, finally, the **Herts and Middlesex** Wildlife Trust has recently gained the finance to buy 70 smart mink traps to augment the 13 it already uses to keep water voles safe. This is a major step forward, not only in protecting local wildlife, but also that of neighbouring Essex by preventing mink from entering that county from the West. Our congratulations to HMWT for securing the finance and committing to managing this substantial trap network to the benefit of all.

With my best wishes,

*Tony Martin*

Chair of the WRE Steering Group



Did you identify all the creatures visiting the rafts? Answers are on the WRE website: [www.waterliferecoveryeast.org.uk](http://www.waterliferecoveryeast.org.uk)