



Waterlife Recovery East

a mink-free East Anglia

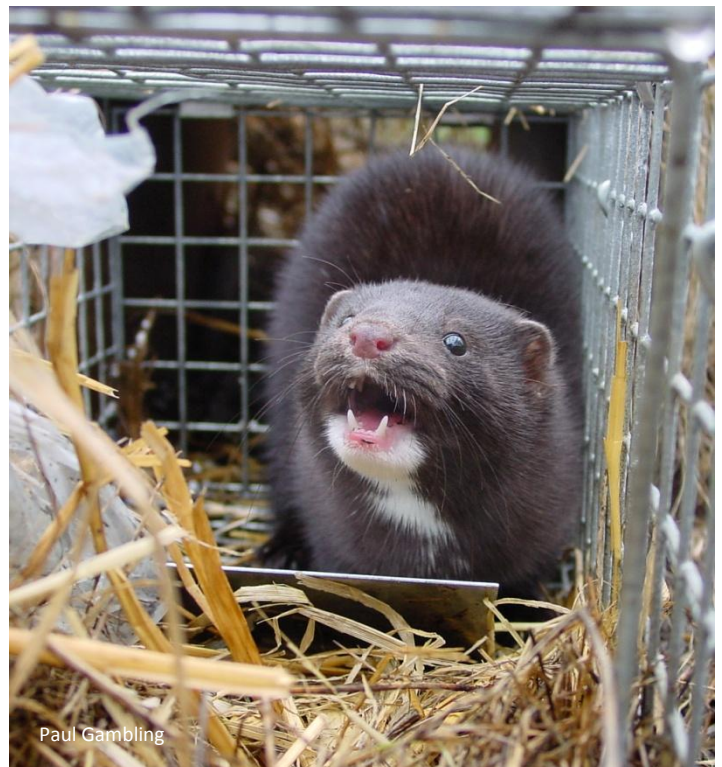
NEWSLETTER 6: October 2022

Mopping up already?

The term mopping up may prompt images of a wet kitchen floor for most people, but for those of us in the field of invasive species management, it has a rather different meaning - the removal of the last remnants of a pest population that has been targeted for eradication. First you knock down (the majority), then you mop up the remaining individuals, be they plants (e.g. Himalayan Balsam), insects (invasive ants), amphibians (Cane toads in Australia, perhaps) or mammals like American mink. In almost all eradication campaigns which involve using traps to catch the target species, the mop-up phase often takes as long to catch the final 5% as the knock-down phase took to get the first 95%, and can cost as much. The hangers-on may be trap shy or live in especially remote places, and usually they are scattered and hard to find, let alone catch. On top of that, populations reduced to low levels often increase their rate of reproduction as food becomes more plentiful, so the mopping-up process is even more prolonged.

All of the above is familiar to members of the WRE Steering Group, and for this reason, and the fact that mink trapping has been going on in East Anglia for decades, with no end in sight, the Group has been very cautious about making any predictions about how long it might take to get anywhere close to mink eradication in our project area. All the indications were that progress was being made, especially in Norfolk and Suffolk - the counties with the longest history of coordinated trapping - but there has been no real expectation of needing to go from knock-down mode to mop-up mode in the near future. Until recently, that is....

Things were going along quite nicely on the trapping front in the early part of 2022, with catches in the usual counties, albeit at a lower level than before in Norfolk, Suffolk and Cambs. This was pretty much expected, because we had caught a lot of mink in 2021 after deploying hundreds of new rafts with Green Recovery Fund money. Catches then dropped away in April, which was also expected, because they always do. Once the mating season is over, mink become

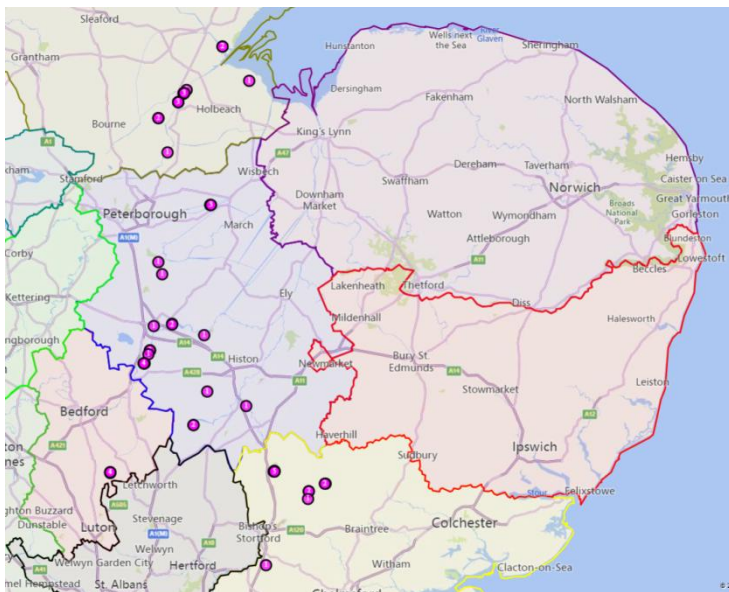


Paul Gambling

Captures of mink are becoming few and far between in the Waterlife Recovery East Core Area

much less catchable. So far, so normal, but as summer approached we still weren't catching mink in the WRE Core Area, then June and July passed with no catches, and we began to realise that something most unusual was afoot.

By this stage, I was wanting summer to be over, so August could arrive, juveniles would be on the move and the regional mink situation would be revealed. And so it transpired - August came and went with no catches in Norfolk or Suffolk, as did September. Scattered sightings continued to trickle in, so mink had not completely disappeared, but by this stage it was apparent that something very significant had happened; there was no evidence that any female had weaned young mink across these two counties in 2022. Our trap network is far from comprehensive, so there may well be a few mink broods out there that have escaped detection (and we've had an unconfirmed report of two kits in Norfolk), but it's hard to imagine that there can be many.



At the outset of this project, our definition of success was that there would be no mink reproduction in the WRE Core Area for a 12-month period. It would be a mistake to exaggerate progress, and we cannot yet be confident that there are no overlooked mink hotspots in the Core. But even a confirmed sceptic would surely have to concede that the Waterlife Recovery East partnership has achieved wonders in a remarkably short time, and the increasing reports of water voles in this region do support the conclusion that mink are now few and far between in Norfolk, Suffolk and E Cambridgeshire - an area equivalent to 7% of England.

Map showing all mink captures during the 2022 juvenile dispersal season so far. See how they form an arc around, but not in, Norfolk and Suffolk, where the vast majority of our traps are. Most of these captures will be of young mink not far from where they were born.

An inevitable consequence of there being so few mink in the Core Area, and so few catches, is that most traps and most volunteers are seeing little action. This can be frustrating, and it may be hard to equate no mink catches with success, but of

course that is exactly what it is. Ironically, total success will be marked by every trap failing to catch a mink. The other side of the same coin is that the few remaining mink become even more important to catch. The biggest mistake we could make now is to relax - do that, and mink will return, destroying the amazing progress we've made over the past few years.

Looking ahead

Although WRE is focussed on eastern England, it was never our intention to limit activities to this region, not least because mink will always be heading our way if they persist elsewhere. The Waterlife Recovery Trust was set up to facilitate collaboration and information transfer across a far wider area, and that has been quietly going on over the past year or so - illustrated by the fact that this Newsletter is circulated to people across much of England and Scotland. Word of WRE's extraordinary progress has reached the relevant DEFRA Minister, and the highest levels of Natural England; there is hope that finance to continue and expand our work, and encourage similar initiatives elsewhere, will derive from NE's forthcoming Water Vole Species Conservation Strategy, which is intended to have mink trapping at its heart.

eDNA as a survey tool for mink and water voles

In July 2022, Essex Wildlife Trust undertook a walkover survey for water vole and mink signs along a 9km corridor of the River Pant (the headwater of the River Blackwater). But in addition to looking for field signs and habitat suitability for water vole, we also took eDNA water samples and had them analysed for mammal species DNA with a technique known as metabarcoding. In total, 33 mammal species were detected including 4 species of bat!

In addition to the main survey we also took samples from a site 6km upstream of our survey site, at Little Samford Hall where a water vole (the first record this century) was caught on a smart raft in February 2022. The point of this was to see whether eDNA sampling was able to pick up water voles from a known location and compare the result to the rest of the catchment where we have no water vole sightings or records.

Water Vole results

The good news was that the physical survey and sightings records matched the results of the eDNA. The only site where water vole DNA was found was at the Little Samford Hall site where the water vole was caught on the raft. No water vole DNA was detected in the rest of the river and no field signs were found from the physical survey either.



Water vole burrows are easy to spot during a survey

Mink results

No mink DNA was detected at Little Samford Hall where mink trapping has been continuous all year and several mink have been caught in 2022. But downstream mink were detected in the main river corridor

including a location where a sighting occurred during the survey. It should be noted that no conclusive mink field signs were found during the walkover. Mink are notoriously hard to survey in north Essex, even when you can find some evidence such as scats, feeding remains or footprints, because these are identical to those left by native polecat. But with the benefit of eDNA we were able to detect both species and differentiate between them. Polecat were found in similar locations to mink showing how much overlap of range there is between these similar sized predators.

Next Steps

This comparison of traditional field signs and eDNA surveys is very useful because it gives us a bit more confidence in this new tool to locate possible mink in the 'mop up' phase of an eradication program. It also gives us a way to differentiate mink from polecat in areas where both species are present and field signs could be misinterpreted. At the recent UK Water Vole Steering Group we talked to the R&D team at Naturemetrics and they proposed plans to develop an in-field eDNA test that would give results on the day rather than by waiting up to 8 weeks for laboratory processing. This could be a game changer and we were keen to support such a test, especially if we could tailor it to the specific species we are interested in; mink and water vole. We will continue to work with them on the development and refinement of this technique, so watch this space.

Darren Tansley - Wilder Rivers and Protected Species Manager, Essex Wildlife Trust

Three years on....

A meeting at the Thetford headquarters of the British Trust for Ornithology in September 2019 brought together an interesting mix of people and organisations with a shared mission of protecting water-dependent wildlife in their own patch of East Anglia by removing invasive American mink. What emerged from that meeting was a desire to cooperate and collaborate, with a view to seeing if the job could be done properly - by removing mink entirely from the countryside. Joining forces under what became Waterlife Recovery East, the partnership formed a Steering Group which continues to meet quarterly, developed a formal strategy, raised money and grew into the formidable enterprise that it is today.

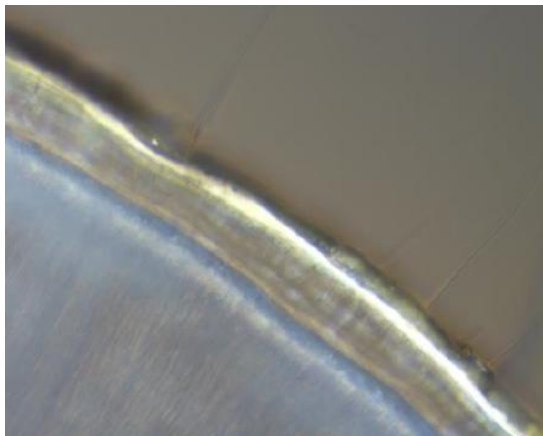
The intention to hold similar meetings annually was scuppered by Covid, but the third anniversary of that initial gathering saw the same venue host a one-day conference entitled '*Prospects for a mink-free landscape*', with 12 speakers from various parts of Britain celebrating the remarkable achievements of WRE in that time, talking about mink control across our large island and looking forward to exciting opportunities ahead. Pandemics allowing, we will repeat the exercise in a year or two, with a focus on volunteer participation, and in a larger venue to avoid a cap on numbers attending.



September 2022 one-day conference in Thetford

More on age

In the last newsletter, I talked about our new study of mink teeth, to discover the age of every animal we capture. We now have results from over 200 mink, and they provide a fascinating glimpse into the



Age lines in the cementum of a mink tooth, as seen under a microscope. To see the lines, a thin slice has to be cut from the tooth, and then stained. It's a skilled job, and few in the world can do this. We use a lab in Montana.

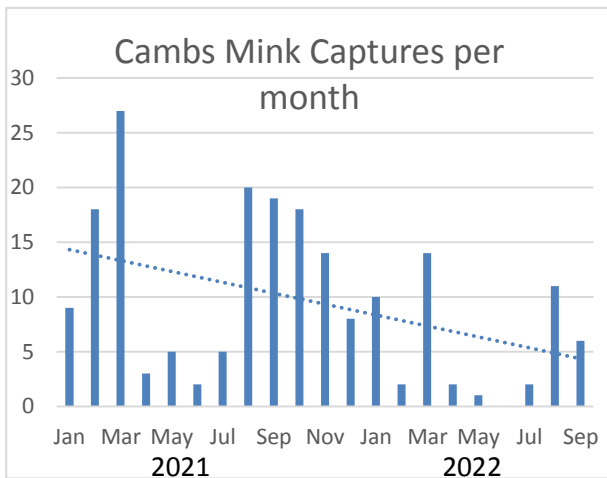
population as a whole. You may remember that the x-rays reveal the size of the pulp cavity in a canine tooth (i.e. how thick are the tooth walls), and we've found that walls strengthen and thicken during the first 6 months of life, after which juveniles (animals less than a year of age) and adults cannot be separated on wall thickness alone. That's where lines in the tooth cementum (the hard surface material) come in; just as in trees, they are laid down every year and can be read under a microscope.

We found that no animals in our sample of East Anglian mink was more than 4 years old, and that two-thirds don't make it to their first birthday, when they would otherwise have the chance to breed. All this helps to explain why mink in our region are declining so rapidly, and water voles are bouncing back, thanks largely to the efforts of those reading this newsletter.

News from around the region

Cambridgeshire (Vince Lea). Cambs continues to produce mink at a steady rate. June was the first month with no captures since we started year-round extensive trapping in 2021, and just one in May, we then had two in July, 11 in August and just six in September. We've already had our first October catch; like so many this autumn it came from the western side of the county along the River Great Ouse close to Bedfordshire.

We are confident that many mink caught this season were born outside the Buffer Zone. In fact nearly a third (17) of the 52 mink caught in Cambridgeshire have come from the 4 traps closest to Bedfordshire!

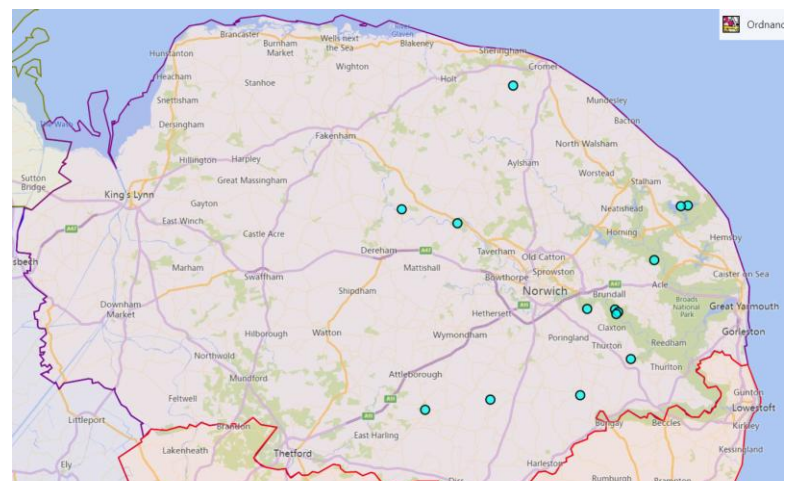


Water vole excluders and monitoring cameras have been fitted to about 20 of our rafts in the Cambridge Water Company area. Cameras have revealed that many of these raft locations have water voles present but so far none have been caught. One particular vole had been caught 3 times before we fitted the excluder but has since been recorded on camera rearing up against the excluder wall and then carrying on its way without troubling the trapper. Four mink (and two polecat-ferrets) have been caught in traps fitted with excluders. No mink have been detected which were put off from entering the traps. The results from this modification are looking very encouraging.

In **Lincolnshire**, the well-established trap networks operated by the North Level and South Holland IDBs in the south of the county have pretty much extinguished mink predation, and the occasional animal now turning up in their traps is almost certainly from outside their drainage area - removed before it can become established. Welland and Deepings IDB, which began smart trapping last year, still continues to catch, but not at the dizzying rate of the early months. Meanwhile, two very welcome new networks - operated by Witham 4th IDB near Boston and by the Greater Lincolnshire Nature Partnership in North Lincs, are predictably very busy. Lincolnshire is a large county full of great aquatic habitats, and full of mink exploiting them, so there is much work to be done here, but the brilliant work of the southern IDBs shows what can be achieved, and it is very rewarding to see that their lead is now being followed elsewhere.

And what's going on in **Norfolk**? We have not caught a single mink in Norfolk for 6 months! The last one in the Broads catchments, which form part of the WRE Core area, was caught on 19th March and the last anywhere in the county was a female caught on the river Babingley on 1st April, writes **Simon Baker**. So how did we get there? We started the year by putting lures 'scented' with anal gland secretion, obtained from our previous captures, in all of our smart traps. This meant that all the rafts were particularly attractive during the mating period, which is focused on a 4 week period around February. Mink would often be caught within a few days of scent being placed in a trap and we caught 30 mink between 1 January and 19th March and then the last one on April Fool's Day! This is despite having 343 smart traps set across the county, so a fantastic result.

Sightings post 19th March 2022



Despite the lack of captures, we know that there are some mink still about in the county as we have heard of 13 sightings that appear reliable, and very recently we learned of 3 mink trapped by a gamekeeper (soon to be a WRE volunteer) north of Norwich. We expect the majority of mink still present to be female as the

sex ratio over the past few years has been heavily skewed in that direction. For example, the sex ratio of males to females in the Core in 2022 is 0.66, i.e. 3 females for every 2 males. If the females bred, we would expect to have started catching dispersing juveniles over the past 2 months, as we have in the buffer counties of Cambs, Lincs and Essex but not in Norfolk or Suffolk.

It is possible that some mink have bred and we recently had a report of 2 juveniles seen at Stubb Mill, Hickling. However, it seems likely that most of the females did not breed or we would have started trapping young by now. This apparent low reproductive rate, for what can only be relatively few surviving females in the county, could be for several reasons. You can see from the mink sightings shown above that those remaining are likely to be widely dispersed so many females may never have met a mate. It is also likely, as described above, that most of the survivors are females so there are likely to be very few males available to father litters. We also believe that there will be no immigration into the Broads area and probably little or none into the rest of the county due to the intense trapping over the border.

One final possibility is that the remaining mink are becoming inbred, which might be expected to lower their fertility. Evidence for this is that Professor Amos has looked at the inbreeding coefficient for the mink that he has sampled and found that this increases as you go from west to east. So mink from Norfolk and Suffolk appear to be more inbred than those elsewhere.

We are now waiting in a state of some excitement to start catching mink again. This will almost certainly happen when we do a further anointing of traps with anal gland secretion next January / February, if not before. **We need some help** with this given the number of smart traps in use, so if you might be able to offer 5-10 days over that period please contact your Project Officer to discuss; we can cover your mileage.

And, finally, in contrast to the heavyweight news above, I thought it would be good to end with a photo of a mink that caused a stir on Facebook recently. The mink with its head apparently stuck in a grating (right), generating accusations that the photographer was cruel in not releasing it, was actually just enjoying some rat chasing, and popped through the grating at will. It went on to kill some nearby chickens. This was in Notts, outside our area of activity at present, but hopefully a county that will be covered if Natural England's upcoming water vole conservation strategy pilot proves to be a success. Nothing is certain yet, but we are advised that it should start early next year.



With my best wishes,

Tony Martin

Chair of the WRE Steering Group
& Waterlife Recovery Trust