



Waterlife Recovery East

a mink-free East Anglia

NEWSLETTER 5: July 2022

A nice problem to have

In earlier newsletters I have mentioned a looming problem that would have been scarcely credible three years ago, but is now firmly upon us in some areas where mink trapping has been carried out effectively - a plague of water voles. Ok, ok, so I exaggerate a tad, and it's hard to imagine that there can ever be too many of the delightful creatures we're all striving to preserve and protect, but the simple reality is that staff and volunteers in many parts of the WRE project area are now spending much more time attending captures of water voles than of mink. While seeing a cute water vole close up, and then watching it swim

away after release, is a thrill on the first and second occasion, that thrill rather diminishes by the fourth time, and positively fades away by the eighth, especially on realising that the same critter may be returning time and again. One wonders if they actually enjoy being caught!



After a long series of mink catches at a private nature reserve in Cambs, and no sign of water voles, a striking black vole thrilled one of the owners when she responded to a trap activation in mid-June. Yet another case of the furry phoenix rising unaided from the ashes once mink have been vanquished.

Realising that all these call-outs to release water voles will only become more frequent as the project expands and progresses, the WRE Steering Group has been considering how best to avoid catching them. The simplest solution would be to just close the trap, but then we'd close a second, fifth and, in time, a 50th and 200th trap. Sure enough, water vole captures would then disappear, but so would the water voles as mink returned and ate them. The reality is that, if we are to eradicate mink, we must find a way to keep all but the most intrepid and ingenious among them out of our mink traps, but of course we can't afford to exclude mink, too. I have wrestled with various complicated ideas based on body weight, and others have proposed an

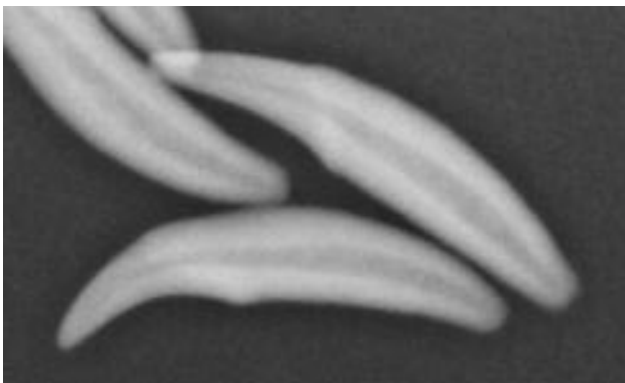
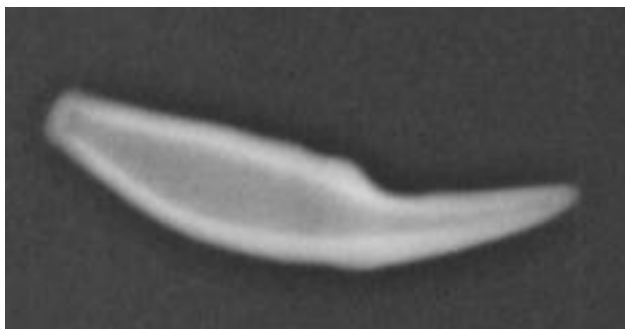
escape hole, but all these ideas had faults and were discarded. Fortunately, we have among us some practical, visionary thinkers, among them Stephen Mace and Cliff Carson who came up with and tested a brilliantly simple design. This water vole excluder (which you'll read much more about below) is just a quickly assembled wall that goes around the trap entrance, made of recycled plastic board and held in place with a couple of cable ties. Mink climb over the wall effortlessly, and all but the largest, most intrepid water voles cannot. We're trialling these devices in a number of spots right now, but so far the field evidence is clear - they work a treat. Ultimately we'll probably end up needing to attach such a device to almost every trap but, if so, what better indication of project success could there be?

In other news, our newly formed charity, the Waterlife Recovery Trust, will soon be funding a part-time technician at Cambridge University to support Prof Bill Amos' mink genetics work. This is an exciting step forward - not only allowing Bill to focus on the more intellectual side of his work, but also increasing the speed and capacity of the flow of DNA samples through his lab. Bill talks more about this below.

Mink age

Knowing the age of each mink we encounter would be an important tool in understanding the population from which they come; in turn, understanding the population of an invasive animal is an important tool in attempting to remove it. In many mammals, including mink, age shows up in layers in the structure of teeth, much as tree rings

tell us their age. The best teeth to use for this are the canines, which are conveniently at the front of the jaw. How hard can it be, then, to remove them and find the age of their owner? Well, harder than you might think. For starters, the teeth are impossible to remove intact with pliers, as a dentist would remove *our* teeth. The only way to get them out in one piece is to rot away the thin layer of connective tissue



X-rays of mink canine teeth. The dark centre is the pulp cavity, which rapidly fills with dentine as the animal gets older. In the upper image, the cavity occupies 55% of the tooth width, which means the animal was a juvenile when it was caught. The figure is 36% in the lower image; these are probably from a yearling. We will know the age exactly when these teeth go to the U.S. for age determination.



Water vole excluder on a mink raft. It's a simple wall, which can be added or removed at any time. No mink have failed to scale the wall so far, and all but SAS-trained water voles are thwarted.

holding them in the tooth socket, and that can be an extremely smelly business. You can't boil the head, because that would risk damaging the tooth structure and losing the lines that will tell us the age.

Richard Lawrence, our Bedfordshire Steering Group rep, kindly volunteered to get us started many months ago, and has recently produced a great pile of neatly labelled paper envelopes, each containing a set of cleaned teeth. While awaiting these, Bill Amos sought to speed up the process by putting heads in a water bath in his lab at 50°C, but quickly gave up that experiment when the gently bubbling tissue generated complaints of the ghastly smell from fellow lab users. Bill Mansfield and I found a way to reduce the quantity of tissue involved, and just this morning Prof. Amos finished the job - sending me a box of 77 teeth to join those from Richard. I will now x-ray them all, filter out the juveniles by measuring the pulp cavity (see photos) and then send the adult teeth to a lab in Montana to have them thinly sliced and 'read' by a specialist who can tell us how old each mink was at its demise, much as a section through a tree trunk can tell us how old the tree was when felled. This, combined with the genetics data, will tell us so much.

Genetics news from Prof. Bill Amos

The genetics work has gone through a quiet but very positive phase. The genetics gets done in my 'spare' time, which means that everything slows down around, for example, the exam season. To keep things ticking over, we have now secured funding via generous donations from three WRE Steering Group members to pay for a technician to work 1.5 days a week until the New Year. This may not sound like much, but it will make a huge difference, and we are optimistic of external funding to extend and perhaps expand this work beyond 2022.

As well as the routine generation of genetic data, the technician will also develop more nuclear DNA markers. We currently use 28, which allows us to tell the difference between first degree relatives and unrelated pairs with around 90% confidence. Good, but could do better! With another 15 – 20 markers, we will be able to identify first degree relatives with over 95% confidence - a small but very important gain. Another key improvement will be to tell the difference between full-siblings and parent-offspring pairs. This is becoming more and more important as we make progress with age-determination (see above). Combined with higher resolution genetics, the aging will allow us to ask whether groups of close relatives caught in an area are just siblings or, with any luck, include one or both parents.

Being able to let the technician do the bulk of the lab-work will also free up my time to provide feedback to volunteers about mink in their local area. For every DNA sample, my aim is to provide an estimate of where that individual was born, based on a genetic map of the region, together with the number and location of any first degree relatives. Imagine a map with dots showing the location of members of the blue family, the red family, the yellow family, and so on. This should be up and running before long.

Can you help?

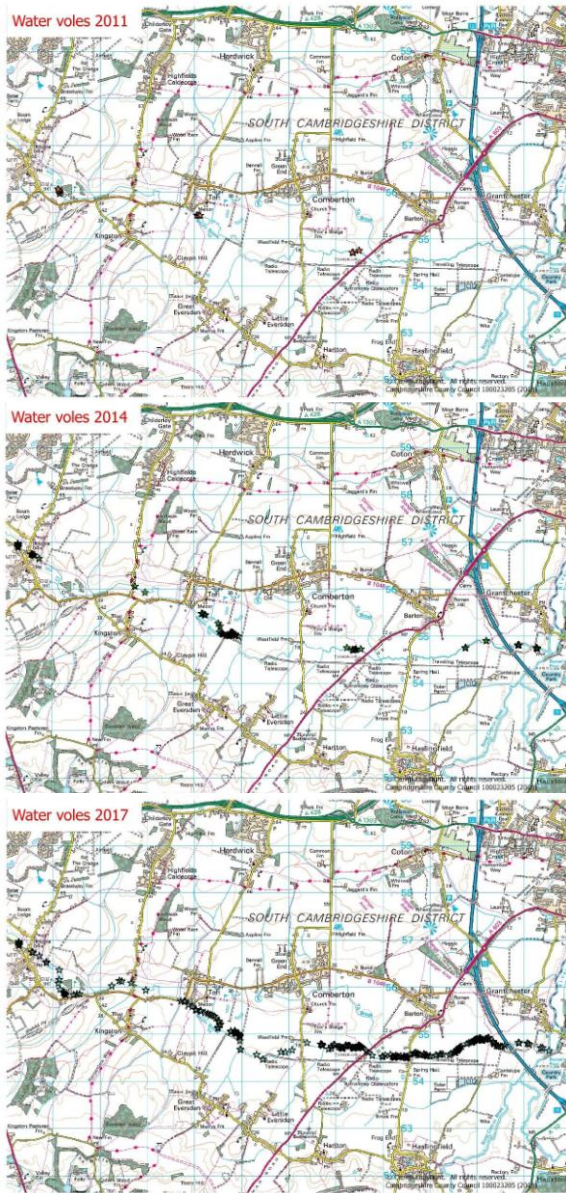
Cliff Carson, our man in the flatlands of the Cambridgeshire Middle Level, has lots of cameras on mink rafts at present, with the aim of getting movie clips of water voles and mink being faced with a wall around the trap entrance - a trial water vole excluder. Important research. Cliff collects the memory cards from these cameras periodically, and then has to spend countless hours looking at short movie clips, sieving the wheat from the chaff - the wheat being clips of animals, the chaff being clips of an empty raft. The cameras are triggered by movement, so most of the clips are initiated by a piece of vegetation moving in the wind, or even dappled sunlight reflected off the water surface. Cliff would hugely appreciate some help with this important, but time-consuming task, and Vince Lea will also soon be looking for similar assistance with the results from a newly-purchased batch of cameras (see Cambs news, below). If you are willing to give them a hand, please contact Vince (v.lea@theCRT.co.uk).



Image from a video clip of a mink on a raft, about to go over the wall of the water vole excluder. But finding these gems in among many more clips of empty rafts is a time-consuming business.

The furry phoenix

The single greatest motivation for American mink removal in England is to save our iconic water voles from oblivion. The evidence is clear - mink have caused a catastrophic decline in water vole numbers, and wiped them out completely in many areas. Once mink have been removed from a waterway by WRE volunteers, it is therefore hugely encouraging to see water voles emerge from the shadows. We are now discovering that



Bourn Brook water voles in 2011, 2014 and 2017. Responding to the removal of mink, in just 6 years the voles reclaimed almost all of their former territory.

remnant populations have often managed to cling on, unnoticed by humans, perhaps in a reed-bed or small stream off a main river, and this is both exciting and important when it does occur. It is tempting to think of water voles as all the same, but that's not the case. Because they rarely travel away from water in England, the voles in each river catchment are reproductively isolated from those in other catchments, and over time they must evolve to be unique - not different species, or even sub-species, but genetically different nevertheless - an ecotype. Every river basin likely has its own, unique voles. From a conservation perspective, an important question is whether a tiny remnant vole population can, in the absence of mink, reclaim its former range?

It so happens that in our region we have a small river where the answer to this question has been found, and it is inspiring. The Bourn Brook is a tributary of the River Cam, just outside Cambridge. Water voles were pretty much wiped out here, as elsewhere, so in late 2010 the Countryside Restoration Trust (particularly WRE Steering Group member Vince Lea) started trapping mink in an attempt to allow recovery of the voles. But would they recover? Surveys were carried out by the county Wildlife Trust in 2011, 2014 and 2017, and the results* were spectacular. Water vole latrines increased from 2 to 38 to 157 in that time, and the species had recolonised the whole river in just six years. With removal of the mink (an astonishing 85 caught in just the first 18 months) and some waterside habitat improvement, water voles bred like the rodents they are, and the future of the Bourn Brook/ R Cam water vole ecotype was secured. The maps here show how water voles spread between each survey.

*Bourn Brook Water Vole and Invasive Plants Survey, Spring 2017. Hawksley, Lockyer, Waldron, Hunt & Williams.

Waterlife Discovery Day

The Countryside Regeneration Trust organised a really excellent event at Cambourne Village College on 23 April, with contributors from several eastern counties and further afield. Our thanks to them all.

What the Fox?

This is a bizarre tale all round, writes Vince Lea of the Countryside Regeneration Trust, but starts with a great example of how we are being noticed and how the public can help – the more our work is known about, the better. Please spread the word, we want to know about every mink in East Anglia!

In mid-June, a householder in Great Shelford, just south of Cambridge, found an animal in distress in the water feature in his garden, and another animal nearby was creating a lot of noise. Unaware of what this creature was, he got his pond net and rescued it. A quick Google afterwards confirmed the identity - mink - and having found the Norfolk Mink Project website he realised that perhaps rescue wasn't the right thing to do! He sent us a message to report the event and ask if he could do anything about it. I went along with four traps, some mink lure and a tin of sardines. It is a most unusual location for a mink – a dry chalk hill, part of the Gog Magog Hills on the edge of Cambridge. The nearest river is the Granta, 2km south of here, and we have had a trap there since 2014, with one mink caught in 2021 and the first water vole in 2022. Quite what the mink were doing there is anyone's guess, but it shows that eradication is going to take some effort.



Shall I or shan't I? Foxes are intrigued by our traps, but most, like this one, don't actually try to get inside.

First thing the next day I got a call from the householder. I couldn't believe what he said, and I don't think he could believe what he could see – there was a well-grown fox cub in the trap baited with sardines close to the house! I went along and, in the end, the only solution was to cut away some of the mesh to release the cub, and soon it was running away, unharmed and no doubt greatly relieved. This is the first, and hopefully the last, fox we catch in a mink cage trap!



One that got away. Not all mink will enter a trap, even with no water vole excluder. This Cambs female (arrowed) seemed interested, but just swam under the raft and then away. Trail cameras are essential tools in allowing us to understand mink behaviour and how we can improve our chance of removing them from the English countryside. Just one trap-shy mink can go on to wipe out entire water vole colonies.

News from around the region

Cambridgeshire (Vince Lea). The CRT has recently received funding from Cambridge Water for a stock of trail cameras to support an effort to improve our knowledge of the remaining mink population in their supply area. The funds will also help us improve the specificity of the mink traps, through the use of water vole excluders. The best evidence will come from mink rafts fitted with an excluder and a camera to monitor the visits. We are particularly interested to know for sure that the excluders do not deter mink; some mink are reluctant to enter standard traps anyway, but if the cameras show a mink going past an excluder and not entering the trap, that might suggest that the excluder reduces the efficiency of trapping and would not be recommended. So far evidence shows plenty of mink going into traps fitted

with excluders but a larger sample size of mink encounters would dispel any lingering doubt.

We will be looking for extra volunteer help with this. We will have 36 cameras and can deploy them on mink rafts to see the effect of the excluder, or in gaps between rafts to see if untrapped mink remain in places we haven't got to. There will be the fieldwork required deploying and retrieving this kit plus screenwork required to view the footage from the cameras. Please contact Vince Lea v.lea@theCRT.co.uk if you would like to help with this. It's quite likely that these excluders will also reduce the chance of some other species wandering into the traps, such as moorhens and mallards, but the more evidence we can get of their effectiveness the better.



Project Officer Stephen Mace with a trail camera pointed at a raft. These devices can be set to take a photo or record video when triggered.

In **Suffolk**, Alice Wickman (Suffolk Wildlife Trust) reports the mink traps have been very quiet, with only 6 mink caught so far in 2022, and some bycatch caught and released. In March, SWT purchased 55 new rafts, traps and Remotis using Environment Agency funding to be used in Suffolk. These will fill gaps in the trap network, mainly on the Rivers Deben, Gipping, Little Ouse and Lark.

We now have some 300 smart rafts working across **Norfolk** but have only caught 1 mink in the second quarter of the year, despite over 32,000 trap nights of effort, and that was on the 1 April on the River Babingley. This is well down on the same period last year when we caught 9 mink, with many fewer smart rafts deployed. We think that this reflects a good inroad being made into the remaining Norfolk mink population during the first quarter of the year. During this period, Stephen and Karl Charters managed to

get all of the traps in Norfolk scented with anal gland secretion. This seems remarkably effective at improving trapping success at that time of year - when a mink's thoughts turn to mating. In contrast, there were many captures of non-target species, especially of water voles, but also some moorhens and water rails. Stephen Mace has been busy fitting water vole excluders to rafts in areas with most activity, and this will be an on-going task over the next few months. However, we know that there are still mink about, having had three reliable reports from the Yare and Wensum. When young start dispersing, we will see quite how effective we have been!



WRE Vice-chair Simon Baker and Norfolk Project Officer Stephen Mace talk about mink trapping to a farming group

We have had some good news on funding, with continued support from the Internal Drainage Boards (IDBs) that are part of the Water Management Alliance. In addition, the two FiPL (Farming in Protected Landscapes) partnerships in Norfolk, the Broads and North Norfolk AONB, have both kindly agreed to support us for another year. This will allow Stephen to keep trapping full time until the end of November and Karl to continue valuable work in North Norfolk. We are extremely grateful for this continued support.

Simon Baker, Tony Martin and Stephen Mace had a very useful field meeting with the Broadland MP, Jerome Mayhew. Mr Mayhew is on the Environmental Audit Committee of the Commons so was particularly interested in our work. We also had an enjoyable evening, with the help of the Shotesham Park Estate, introducing members of the Institute of Agricultural Secretaries and Administrators to our work, and were also treated to an excellent demonstration by River, Stephen Mace's mink detection dog.

Darren Tansley (Essex WT) writes that preparations are underway for a water vole and mink survey of the River Pant in NW **Essex**, whilst assessing the habitat for mink raft installation. In addition to the more traditional surveys, eDNA samples will be taken to supplement those collected in the past. We also hope to install an empty mink raft in the beaver enclosure at Spains Hall to test how beavers react to its presence. As beavers become an ever increasing part of the UK landscape we will inevitably need to control mink within their territories and it is important to know whether rafts will be susceptible to damage.

Mink trapping in some parts of **Lincolnshire** has been quiet in the first part of 2022, writes Caroline Laburn (Water Management Alliance). After a flying start in 2020 with a record number of 23 animals caught by South Holland IDB in the first 6 months alone, just 3 were caught in the first 6 months of 2022. This has also been echoed with reduced catches from North Level IDB (1 animal caught) and the Welland and Deepings IDB (7 animals) in 2022. These significant reductions will be playing a major contribution toward nature recovery on Lincolnshire waterways.



We have discovered that IDBs are extremely well placed to undertake mink trapping due to their close links to landowners, NGOs and other partnerships. Mink trapping will also play a major contribution toward biodiversity enhancement as per a requirement of the new Environment Act 2021 and IDB Biodiversity Action Plans, and also puts IDBs in a great position regarding any future biodiversity reporting duty to DEFRA. It would be great to encourage more IDBs from Lincolnshire and beyond onto this project and we would welcome interest. Please contact caroline.laburn@wlma.org.uk for further details.

And, finally, I've just checked the project database to find out how many mink have been caught by WRE partners across the region over the past quarter. With many hundreds of traps active, and many tens of thousands of trap nights of catching effort, we collectively managed just 9 mink in April, 1 in May and 1 in early June. Even for a traditionally quiet time of year, that's an astonishingly low catch, and testament to the hard work invested over the past few years. Sightings continue to trickle in, so we're not close to eradication yet. But, with the East Anglia mink population having been so reduced, it's hardly surprising that the water vole trajectory is going rapidly in the opposite direction.

Just this morning (30 June) we had word of yet another site (Stowbridge, W Norfolk) with its first water vole, and with that excellent hot news I'll wrap up this, the 5th WRE Newsletter.

With my best wishes,

Tony Martin

Chair of the WRE Steering Group & Waterlife Recovery Trust

