# Mink control in conservation

**Summary**

Mink control is an important measure in the conservation of threatened species such as the water vole. We want to be able to offer solid practical advice on controlling mink that ensures conservation goals can be met. In 2002 we did a short project to look at trapping techniques. Here Jonathan Reynolds (pictured on page 39) explains what the study has shown.

**An American in Europe**

The colonisation of the UK by American mink is a comparatively recent event that is still developing. Introduced for fur farming in the 1920s, escaping mink were first recorded to have bred in the wild here in the 1950s. The Trust's National Gamebag Census documents the entire rise of mink from an occasional local oddity in the early 1960s to a widespread and frequently targeted predator. Mink are now found in most of Britain, although some offshore islands remain mink-free. There is field evidence that mink have recently declined in distribution and numbers as otter populations have recovered.

Similar histories saw the American mink introduced throughout Europe, where it apparently displaced the indigenous European mink, reducing the latter to the status of a relict species in small parts of NE Europe. Arguably the American mink merely occupies the same ecological niche. On the other hand, large impacts of American mink on water vole populations, on some water birds, and on island populations of seabirds and waders, have been convincingly documented in the UK and elsewhere in Europe. The water vole is a threatened species in the UK, showing dramatic collapses in recent years for which the mink is thought primarily responsible. Affected bird populations in the Outer Hebrides are of international importance, and their fate is viewed with sufficient concern that Defra currently fields a team of trappers and scientists costing some £320,000 a year.

**Ecological effect**

Assessments of the ecological effect of introduced mink have to reckon both with the unique set of species native to Britain - an accident of our isolation after the last ice-age - and with man's subsequent alteration of both the species list and the environment. Thus the water vole in Britain is exclusively attached to water, whereas the same species in continental Europe is more likely to be found burrowing in open fields far from water. Close attachment to water margins exposes our entire water vole population to mink, which hunt exactly these habitats. So it is noteworthy that the

*The mink is an introduced species to the UK. It is a fierce predator and is putting our native water vole at risk. (Laurie Campbell)*

*Raft preparation on the Avon. From left to right, Rhian Leigh, Des Purdey, and Mike Short. (Jonathan Reynolds)*

European mink is thought never to have been present in the British Isles.

At the same time, pressure from human activity has confined many of our seabirds and wading birds to a limited number of breeding sites which are especially good because they are predator-free. The arrival of American mink on those sites therefore becomes a matter of international concern, not solely because of the mink, but because the persistence of these species has become so dependent on a few locations. Historically, the Outer Hebrides have been uniquely favourable for waders and seabirds, attributable to their lack of mammalian predators. Thanks to human interference, they now face substantial threats from both mink and hedgehogs.

**Trapping aims**

The Avon catchment, in which The Game Conservancy Trust headquarters is situated at Fordingbridge, was one of the original areas in which mink established in the wild, thanks to the presence of fur farms in the area. Initially MAFF attempted to eradicate the escaped population by trapping, but they abandoned the attempt in 1976 on the grounds that eradication was clearly not going to be achieved without huge expenditure, if it was feasible at all. Additionally, MAFF concluded that mink were not an 'agricultural' problem.

Currently, therefore, those who trap or hunt mink have fairly local benefits as their aim, rather than eradication at a national level. Recently, many wildlife bodies have joined this cadre, convinced that intervention is necessary to ensure the persistence of water voles.

In 2001 we began to ask some fundamental questions about mink culling. Is it possible to achieve significant conservation benefits by mink culling on a local scale, or is it necessary to suppress the population over a whole river catchment? Given that traps must be inspected daily, is it possible to improve our detection of mink so that trapping effort can be used more incisively? How many traps should you use? Is

*Attempted eradication of mink on the Hampshire Avon by cage trapping in the late 1960s, beside Burgate Manor. The figure in the foreground is Charlie Swan, father of our current Head of Education, Mike Swan. (Charles Coles)*

*Rhian Leigh fixes a finished raft in position in slack water among bank-side vegetation. (Jonathan Reynolds)*

there anything to choose between live-capture traps and cheaper spring traps? How long should you run a trap before concluding that it is in the wrong place or that no mink are currently present? Is trapping improved by the addition of food baits or other scent attractants? Is it better to concentrate mink trapping effort near prospering water vole colonies (to protect them), or at sites where water voles have been reduced in number (to allow re-expansion)…and so on.

To answer such questions, and thus to develop useful practical advice, we needed most of all to find an efficient means to detect the presence of mink, something more sensitive than waiting for a trap to catch. Established mink survey techniques rely on searching for field signs: faeces ('spraints') or footprints. These can be extremely difficult to find. On our chalk stream catchment, the bank-side vegetation is typically lush, and searching becomes almost impossible during the summer. In these circumstances, many river managers trap only when mink are seen on their beat. Besides, a chance collaboration with the Dorset Wildlife Trust on a small local river (see *Review of 2001*, page 44) had taught us that even a location clearly used as a sprainting site by mink might be visited by mink only every two or three weeks. A trap at that site would have a low success rate, whereas during the same period there would be dozens of visits by non-target species at risk of capture in traps.

*Mink tracks were recorded in perfect detail. (Jonathan Reynolds)*

**Curiosity kills the cat**

So we invented the concept of a raft that could double both as a means of detection and as a trap site. We gambled heavily on a hunch that mink would be curious enough to explore such rafts that suddenly appeared on their patch. The raft would be pushed into the marginal vegetation, which mink love to hunt (they are not strong swimmers like otters, and their diet reflects this). Each raft carried a wooden tunnel dimensioned to house a spring trap (Fenn Mk 6, Springer No 6 or Magnum 116). Most of the time, though, this tunnel acted as the weather cover for a plastic cartridge holding a clay-based medium to record tracks of visiting animals. The cartridge drew up water from the river, remaining continuously wet and receptive to tracks. A field trial using these rafts was designed so that it could be carried out by Rhian Leigh, an

MSc student from Reading University, and Mike Short in a single summer (April-August).

In 2001, our GIS team had carried out a questionnaire survey that identified all the major riparian owners and fishery managers in the upper Avon catchment (*Review of 2001*, page 86). From this basis, Rhian negotiated access and established rafts at regular intervals along each river. At each site, she and Mike carried out a 30-minute search for field-signs of mink, allowing comparison of the rafts against this established survey technique. We decided to check rafts at two-week intervals, each raft receiving three checks, equivalent to 3,024 trap-nights in total.

Firstly, mink did visit the rafts, and the experimental tracking medium recorded their visits superbly. Indeed, animals as small as water shrews and wagtails left clear footprints. It was evident that multiple visits by mink often occurred between fortnightly checks, and on many rafts there had been visits by mink of different sizes, including juveniles. Importantly, the chance of finding tracks did not decline with each successive fortnightly check, demonstrating that the rafts held a permanent curiosity for mink, not merely a novelty interest.

**Mink distribution in the Avon catchment**

One of the big unknowns was whether mink were present throughout the upper Avon catchment, or only patchily distributed. Surveying for field signs around our raft sites discovered mink at only 31% of them, whereas at only 25% of the same sites did landowners believe they currently had mink present. Even where trapping by river managers was on-going, our rafts recorded the presence of mink during periods when no captures were made in traps. Our rafts recorded mink at 56% of sites, so we clearly have a more sensitive technique than anything previously available. Additionally, we were able to calculate that where mink were present there was an 81% chance of detecting them in two fortnightly checks. Thus we had also established that mink were only patchily distributed through the catchment, at least in summer.

Embedded in our pilot study was a neat experiment to answer a further question. We wanted to know whether a scent lure could add anything to the success of our rafts. In North America, fur-trappers working long trap-lines use specially-formulated scent lures to bait their traps. Most of these have a sweetly aromatic character, rather than being food-based or territorial. Although many mink trappers use such lures, curiosity is believed to be more important than scent in the mink's downfall. We chose to test the mink lure most popular among North American trappers (Russ Carman's 'Three Rivers' lure). To do this, we placed not just one, but a pair of rafts at each site in our survey. By flipping a coin, one of each pair was chosen to have lure added, and at the end of the season we compared the history of the two rafts at each site. Our results showed that mink tracks were equally likely to be found on rafts without lure as on those with. So, in the summer at least, this particular scent lure added no extra 'pulling power': curiosity was enough.

**Immediate benefits**

In this pilot study, we made no attempt to trap mink, although that is clearly the next step. Mink run through the raft tunnels readily, so there is every reason to believe they will be trapped there. Indeed, we anticipate that trapping success on rafts will be higher than for bank-side traps, because the raft is actually in the habitat being hunted.

One immediately apparent benefit of using rafts is a saving in manpower. Having a monitoring system like this allows you to commit trapping effort only where (or when) mink are known to be present. To be efficient, you don't want a daily commitment to check traps at sites where there are no mink. On a catchment-wide basis, manpower savings of up to 63% could be achieved in this way, given the accessibility of the river catchment.

Many keen trappers would argue that capture is the best way to detect mink. For a river keeper tied to a restricted river beat, whose trap round is a consistent part of his daily routine, no manpower saving is obtained by using rafts. But to be blunt, most people do not trap mink in this way. On the Avon, most landowners and managers trapped either in response to mink sightings, or during a seasonal window in the autumn (when the chance of catching a mink is greatest), or both. Besides, even the saint who runs his traps continuously must be in some quandary. Is he achieving enough to have a real conservation benefit? Could he do better? What if he had twice as many traps? Would his traps catch better if they were moved to new sites?

On rivers where rafts can be used (which may not be possible, for instance, on rocky spate rivers), they can be used to explore new trap sites, while

*Excluders under trial to limit visits by non-target species. (Rhian Leigh)*

*A mink's foot (right) makes a clear impression on our clay-based visitor detector inside the trap. (Jonathan Reynolds)*

also checking the success of trapping so far. The conversion of a raft from monitoring to trapping mode or back again takes only minutes. In monitoring mode, the raft can be left for extended periods. Given the conditions we found on the Avon, once detected, a mink would be caught at the same site within two weeks of switching to trapping mode.

**Towards a better trapping strategy**

More than anything, rafts give us as wildlife biologists the means to develop effective strategies for mink population control, and to answer some of the basic questions that still need answers. The permutations of rafts and traps for incisive experimental design are almost endless. One question that we have already addressed is how to exclude otters and other non-target species from traps. Using paired rafts again (as in testing the scent lure), we compared rafts with and without prototype excluders, this time in autumn when there were plenty of mink about to take part in the experiment! Some refinement of the basic excluder design is clearly still required because, although visits by mink were undiminished by presence of the excluder, some visits by moorhens and coots still occurred. Otters are well established in the Avon catchment, but we recorded no otter footprints in tunnels during any of our fieldwork. However, we did find otter spraints on top of the tunnel roof on three rafts, including one without excluders.

Another fundamental question is the choice between spring traps (kill traps) and (live-capture) cage traps. Spring traps are relatively cheap, easy to transport and to use, and have undergone testing by Defra to ensure standard levels of humaneness. Their chief drawback is the potential to kill or injure non-target species. Live capture traps are far more appealing to conservation bodies because the principle appears more humane, and because of the potential to release unintended non-target captures. On the down-side, they are considerably more expensive and cumbersome to transport, and experience elsewhere suggests that some individual mink may be shy of cage traps. These differences between the two trap types are far from clear cut, however. Live-capture traps are not regulated by Defra, so no standard of humaneness is applied to them. Few data are available on the condition of target or non-target animals following imprisonment in cage-traps for up to 24 hours, or on the survival of released non-targets. Equally, no data on field performance of spring traps are available. Thus the choice facing the operator is still very much an open question, but one that we hope to answer shortly.

Besides clearing up these general dilemmas, we want to use rafts to assess specific mink control efforts, both in terms of mink population control, and in terms of conservation benefits. Collaborating with conservation bodies, we hope to turn deliberate trapping programmes into a co-ordinated learning exercise. In this way we can develop advice and ensure that mink control genuinely achieves its intended purpose.