Waterlife Recovery Trust

Consequences of pausing mink trapping during the summer months

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Summary

The concept of closing mink traps in summer because of perceived animal welfare benefits arose before mink eradication was known to be feasible, and has persisted to some extent, unchallenged, for years. This paper examines the impact of electing to close mink traps in summer, or to delay the start of a new trapping operation until the autumn, on three related matters: animal welfare, water vole conservation and the feasibility of mink eradication. In all three cases the impacts are profoundly negative. It is likely that American mink would persist in the British countryside if such a practice was to be implemented because their eradication, already underway in much of England, would no longer be achievable. The data upon which these results and conclusions are based were collected from both coordinated trapping over large areas and small scale trapping in areas with no trapping neighbours. The results are the same in both cases. Whether a trap is isolated or part of a landscape scale operation, to close it in summer or delay opening it until autumn would be to diminish the welfare of mink and their prey and adversely impact water vole conservation.

Introduction

In the past, before mink eradication in Britain was known to be feasible, some held the view that trapping mink should be paused in summer (usually defined as May-July in this context) because of the risk that lactating females would be caught, leaving kits to die in the nest. Inadvertently, this position implied that it was more important to save young mink from this fate than the young of the female water voles, kingfishers, moorhens, bitterns, harvest mice etc that the protected mink would go on to kill, but nevertheless the view persisted to some extent, albeit rarely discussed.

Today, we know that American mink can indeed be eradicated - removed entirely from England and probably from all of Britain - with huge benefits to the native wildlife species that they have preyed upon for the past century. The eradication trial in East Anglia that proved it could be achieved was based upon year-round trapping, and all participants (conservation charities, Government agencies, county wildlife trusts, water management bodies, angling and shooting organisations, as well as many hundreds of volunteer trap managers) adopted this strategy. Recently, however, the idea of closing mink traps in summer for perceived animal welfare reasons has re-emerged. Because it conflicts with the strategy that freed East Anglian wildlife of mink predation and could plausibly cause a national eradication programme to fail, it is now timely to investigate whether the rationale for closing traps is valid and what the impacts of trap closure would be on mink prey populations and the feasibility of eradicating mink.

This paper attempts to answer a question in three parts.

What are the consequences of pausing mink trapping during the summer months on:

1. the welfare of mink and their prey
2. water vole survivorship and conservation
3. the feasibility of mink eradication

Results

1. Welfare of mink and their prey.
Using the Waterlife Recovery Trust's extensive database on mink and mink trapping across 39 English counties, and restricting data to the four most recent complete years of operation (2021-2024, during which time 437 mink were captured in the months May-July), we can estimate many of the key factors involved here. The main results were these:

a) Lactating mink comprised 9.6% of those captured during the months of May, June and July.
b) Conservatively assuming that each mink consumes just one prey item per day, the best estimate of the number of prey broods perishing (because their mother was killed by a mink) was 112 for each mink brood saved (details in Annex 1). If the results of a mink diet study by Strachan and colleagues (1998) are typical (24% of the diet in May and June comprised water voles), approximately 27 of these lost broods are likely to be of water voles.

2. Water vole survivorship.
The study by Strachan et al mentioned above demonstrated that the proportion of water voles in the diet of mink in his study area was far higher in May and June than at any other time of year, and that predation was differentially on breeding females with kits. Closing mink traps in summer protects this predator at the very time of year when their favoured prey, water voles, are at their most vulnerable.

3. Feasibility of mink eradication
The catastrophic decline of water voles in England, and indeed most of Britain, has been largely attributed to the reciprocal increase in the number and spread of American mink. Consequently, if mink can be eradicated, the expectation is that water voles would recover. Indeed the water vole population *is* already recovering in the now mink-free region of East Anglia. If pausing mink trapping in summer jeopardised the chances of achieving a mink-free Britain, then clearly it would be disastrous in terms of water vole conservation.

There are several ways in which closing mink traps in summer could bring about this outcome.

a. Critically reducing trapping effort. For eradication to be achieved, more mink must be captured than can be replaced by reproduction; the greater the difference, the more rapidly eradication will be achieved. The May-July closure of WRT traps in 2024 alone would have saved 303 mink that otherwise would have been removed from the population. However, the reality on the ground, where most traps are managed by unpaid volunteers, is that very few indeed would be closed only for these three months. Most would likely be closed at some stage in April, and would be re-opened in the autumn, probably after harvest and

establishment of new crops. Late summer is the busiest time of year for most farmers. August and September are peak months for mink catches (30% of the catch 2021-2024), so the overall impact of a summer closure would almost certainly be to reduce the annual catch by a third or more. This magnitude of catch reduction could, in itself, cause eradication to fail by diminishing the number of annual mink removals to below that of juvenile replacements.

b. Increasing cost. Even if the decreased catch did not prevent eradication altogether, it would inescapably slow the rate of mink population decrease, and in turn that would increase the duration and therefore cost of the eradication work. It could easily double or quadruple the cost of a year-round programme. Given how difficult it is to raise money for even the swiftest and most cost-effective operation, it is obvious that any significant (and avoidable) price hike could destroy any chance of success.

c. Volunteer fatigue and frustration. There is no realistic prospect of sufficient money being available to pay for a fully professional team of trappers to bring about mink eradication. For this reason, the current WRT operation has been largely based on harnessing the work of thousands of volunteer trap managers. To keep volunteers motivated and dedicated is challenging, especially over long periods, and many are irreplaceable in that they own stretches of waterway that are inaccessible to anyone else. By virtue of hard, careful work and good communications, and the promise that their efforts will be time-limited, WRT has managed to keep volunteer drop-out to low levels, but this could not be achieved if the operation was to be significantly extended. Gaps in coverage would soon appear, and they alone could lead to project failure. At best, professional staff would need to replace this lost coverage, and the cost of that would soon escalate to impossible levels.

d. Perception that trapping mink is inhumane. Many of the organisations and individuals managing mink traps are uncomfortable at the prospect of killing mink in the name of conservation, but do so because, on balance, they consider it to be justified. They are reassured by the fact that high standards of animal welfare are achieved by using RMD-monitored cage traps. The closure of traps in summer inescapably implies, rightly or wrongly, that to keep them open would cause animal distress or cruelty. This perception would be enough to persuade some that, on balance, they would prefer not to be involved any longer. Losing this trapping effort, alone or in combination with other factors above, could cause eradication to fail.

Discussion

The eradication of an introduced invasive predator on a landscape scale has rarely been achieved worldwide. Failure is common, especially with mustelids. Success depends, among other things, on a clear and realistic strategy, excellent methodology and attention to detail. There is no room for compromising the basic principles of eradication. The removal of American mink from Britain would be the largest INNS eradication in the world, by an order of magnitude. It can only succeed if there are no weaknesses. Failure would mean, among other things, the inhumane kill-trapping of mink and non-target animals in perpetuity and the end of any hope of significant water vole recovery.

This paper set out to investigate the consequences of pausing the trapping of mink in summer and, in doing so, it examined whether the original justification for the pause - animal welfare - has merit.

Whether the consideration of animal welfare is restricted to direct trapping consequences (i.e. trapped animals) or includes the indirect impacts of trapping (the impact on non-trapped animals), pausing trapping in summer demonstrably leads to far poorer welfare outcomes than were there to be no pause. With a pause, more mink will be trapped and destroyed overall (potentially many times the minimum number necessary), and far more broods of dependent young will perish - perhaps a hundred broods of mink prey species for every mink brood saved. Furthermore, the basic rationale for closing traps - to protect lactating mink - is clearly flawed. When they have dependent young, mink are rarely trapped - they comprise a mere 10% of the catch between May and July. In reality, most traps would not be re-opened in early August because late summer is the busiest time of the agricultural year, so the percentage of mink saved by the trap closure that had dependent young would be even lower.

In terms of the impact on water vole number and conservation, the closure of mink traps at the very time of year when voles feature in the mink diet most prominently would clearly be detrimental. If trap closures caused mink eradication to fail, as could easily happen (see below), then the consequences for water voles would be no less than catastrophic.

Finally, this paper considered whether closing mink traps in summer could lead to the failure or abandonment of mink eradication operations in Britain. The answer to this question is yes, on one or more of several grounds - feasibility, cost, increased duration and loss of volunteer/partner organisation participation. It is hard to imagine that the existing WRT-managed eradication programme, or indeed any large-scale INNS trapping operation globally, could succeed if anything more than a trivial number of traps were to be closed for a trivial amount of time. Such practice is simply inconsistent with a serious eradication operation.

Catch per Unit Effort (CPUE) results from the current WRT-managed eradication programme in Lincolnshire, England's second largest county, indicate that mink density declined by over 80% in the 12 months from Dec 2023. If this rate of decline is sustained, mink reproduction would cease after three or four years. When eradication can be accomplished within such a tight time period, every month of delay in setting up a trap network would be costly. There is no benefit in delaying trap placement, and much to be gained in deploying traps as soon as they, and the people to manage them, become available.

Reference

Strachan, C., Jefferies, D.J., Barreto, G.R., Macdonald, D.W. & Strachan, R. (1998). The rapid impact of resident American mink on water voles: case studies in lowland England. Symposia of the Zoological Society of London, 71, 339–358.

Annex1

Predation rate assumption

Mink consume a very wide range of prey, but mostly small mammals and birds varying in size from mice and water voles to lapwings and even herons. The number of prey items taken per day must vary considerably, but data on this subject are almost non-existent. For the purposes of this analysis, the likely very conservative assumption is made that each mink takes just one prey item per day.

The initial equation of interest is this:

$N_{prey} = N_{motherdays} + (Broodsize*N_{juvdays}) + (Ratio_{non\text{-}lact/lact} *N_{non\text{-}lact})$, **[Equation 1]**

Where:

N_{prey} is the total number of prey animals that will be predated as a result of one lactating female mink surviving due to trap closures.

$N_{motherdays}$ is the mean expected remaining lifetime, in days, of an adult breeding female mink (310 - estimated from the age frequency distribution of mink in the WRT database).

Broodsize is the mean brood size of feral American mink in England (estimated to be 5).

$N_{juvdays}$ is the mean expected lifetime, in days, of a nestling mink (estimated at 365).

$Ratio_{non\text{-}lact/lact}$ is the expected ratio of non-lactating to lactating mink in the catch in the months May-July if traps were open (estimated at 8.82).

$N_{non\text{-}lact}$ is the mean expected remaining lifetime, in days, of a non-lactating mink (males and females) (estimated as the mean juvenile life expectancy of 365 days).

Equation 1 therefore becomes:

$N_{prey} = 310 + (5*365) + (8.82*365) = 5,354$

If we now assume that half of the prey items are male, and very conservatively that just half of the females in just one month had dependent broods, then the number of perished broods would be

5,354 / 2 / 12 / 2 = 112