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1 INTRODUCTION

The water vole (*Arvicola terrestris*) is Britain's fastest declining mammal. Populations have undergone a long-term decline since 1900 caused by unsuitable riparian management and habitat fragmentation. This was followed by a sharp decline throughout the 60s and 70s, which coincides with the spread of American mink (*Mustela vison*) which are very able predators of water voles. Over the last 10 years water voles have declined further by a staggering 90%. Once common in Worcestershire, water voles are now only recorded in Bromsgrove District. Present populations are small and fragmented and therefore prone to extinction. To save the water vole from extinction in Worcestershire, action is urgently needed. Conservation action should focus on two main issues. Firstly, habitat will need to be created, restored and managed appropriately to enable re-connection of isolated populations. Secondly, a control programme will need to be implemented to reduce or eradicate the threat posed by mink. This report will explain the need for a strategic approach for the trapping of American mink and will outline the method, location and costs required to do this effectively.

1.1 WATER VOLES

Water voles are found in a variety of habitats, small streams and rivers as well as ponds, lakes and other wetland areas. They make burrow systems in steep banks, with entrance holes above and below the water line. They feed on a range of vegetation found alongside the water and often leave small piles of chewed vegetation at favored feeding stations.

The water vole is a UK BAP priority species and a 'flagship species'. Measures taken to conserve the species can achieve many other biodiversity targets for wetland habitat and species conservation. Water voles respond quickly to habitat change and are therefore an excellent biodiversity indicator species. Fragmented and isolated populations remain in Bromsgrove District, but due to their low population densities, these individuals are vulnerable to extinction.

1.2 DISTRIBUTION OF WATER VOLE IN WORCESTERSHIRE

Water voles used to be common throughout most of Worcestershire (*Worcestershire Biological Record Centre*). However, a countywide survey conducted in 1998 found that Bromsgrove District hosts the last populations of water voles in Worcestershire, with populations on the Worcester-Birmingham canal and within Bromsgrove town itself. In 2002 the Worcestershire Wildlife Trust (*Graham A. 1998*) surveyed thirty-two sites in Bromsgrove (not including the canal). Eleven sites (approx. 34%) showed positive signs of water vole activity. Compared with the national survey, (*Strachan C. et al. 2003*) which only found signs on 14% of the surveyed sites, this stresses the importance of the population in Bromsgrove. Water voles were found on the Battlefield, Spadesbourne and the Sugar Brooks.

1.3 MINK

The American mink is an introduced species. It was brought to Britain from North America in the late 1920's to be bred for the fur trade. Mink were released into the wild as fur farming became less profitable and many escaped. Mink have lived wild in the UK since the 1940's and have successfully established in the wild and are now common across most of the UK.

Mink live near water and are seldom found far from riverbanks, lake and marshes. Even when roaming, they tend to follow streams and ditches. Sometimes they leave the water altogether for a few hundred metres, especially when looking for rabbits, one of their favourite foods. Mink will live inside towns, if suitable water is available, though in Worcestershire this seems to be less common.

Mink are very effective hunters and are able to wipe out a colony of water voles in less than a few years. Like water voles they are semi-aquatic and forage predominantly along watercourses. Mink are slender enough to enter water vole burrows enabling them to catch over-wintering voles and young. The breeding season for mink starts before that of water voles. This causes damage to water vole populations when their numbers are at the lowest point (after winter/before breeding). (*Strachan R. & Moore T. 2006*)

Many studies have demonstrated the loss of water vole populations due to predation by mink (e.g. Barreto and Macdonald, 2000) and such losses often occur in habitats which have previously supported healthy populations of water voles.

2 AIMS OF THE PROJECT

The aims are to:

- Minimise the impact of American mink on the existing water vole population in Bromsgrove.
- Allowing the existing water vole population to expand downstream on the Salwarpe.

3 BACKGROUND TO THE PROJECT

Worcestershire Wildlife Trust (WWT), Bromsgrove District Council (BDC) and British Waterways (BW) are working together to safeguard the populations of water voles in the Bromsgrove District.

In 2002 BDC paid WWT to conduct a water vole survey on watercourses managed by BDC and to give management guidance and advice how to manage these watercourses positively. The report is called; 'Water Vole: A conservation strategy for Bromsgrove'. Unfortunately, BDC has not yet been able to carry out many the management proposals.

In 2007 BDC organised several 'watercourse task group' meetings in which the concern about water voles were raised and how commitments undertaken through the Worcestershire Biodiversity Action Plan (BAP) might be delivered. As a result of these 'watercourse task group' meetings BDC recently employed a 'biodiversity and environment officer' and will also provide officer time for the protection of water voles. **If you mean me, this is not accurate. The task group was one of the regular Councillors Scrutiny exercises, and this should be mentioned. My job was changed as a result of this but due to other things going on in my team, and I am not supposed to be involved in the practical side of things. My job title is Natural Environment Officer but I am still in the planning team so supposed to be 'strategic', although I get involved in practical where I can and am trying to develop this side of the post as I think it's important. I'm not the same as a 'Biodiversity Officer' would be.**

During the same period the Worcestershire Biodiversity Action Plan (BAP) for water voles has been reviewed (not yet published). This review was carried out by BDC, WWT **EA and BW. Should probably put full names not acronyms?** In this plan, a series of targets and actions are included for the protection of water voles. Some of the actions underline the urgency for monitoring and trapping of mink.

WWT owns a 27 ha wetland reserve (Christopher Cadbury Reserve at Upton Warren) just 2 miles south of Bromsgrove. It consists of open water, fen and reedbed and is situated on the Salwarpe downstream of Bromsgrove (Figure 1). Together with the adjoining sailing lake the reserve offers valuable habitat for water voles. Recently however, mink is frequently recorded on the reserve, which suggests a high density of mink present. This is likely to increase the amount of mink spreading to Bromsgrove and to the canal.

Recent informal surveys have found no water voles on the Worcester and Birmingham canal on sites where they were previously present. It is believed that the cause of this sudden disappearance is the impact of American mink. The same seems to be the case on sites on the Sugar Brook. All parties agree that the further spreading of mink into core areas will have to be tackled using a partnership approach, in order to safeguard existing water vole populations.

Do you want to mention the role of BW and the way we are tying in together to be more strategic?

4 PROJECT AREA

Refer to figure 1 for a map of the project area. The Worcester and Birmingham Canal stretches beyond Bromsgrove District and holds populations of water voles further north than Worcestershire. BW is undertaking a larger scale mink-trapping project on its canals throughout the West Midlands. Oh ok, it's here! ☺ Trapping on the Worcester and Birmingham Canal will therefore be co-ordinated and funded by BW itself and will not be discussed in detail in this strategy. BW will be working closely together with WWT and BDC regarding the trapping on the Worcestershire and Birmingham canal and Droitwich canal in Worcestershire. The methods and locations which are outlined below, only refer to the work to be done on the Salwarpe (inc. Upton Warren Reserve), Sugar Brook, Spadesbourne Brook and Battlefield Brook and do not include the work co-ordinated by BW.

5 METHODOLOGY

American Mink will be monitored and trapped using mink rafts designed by the Game Conservancy Trust (*The Game Conservancy Trust. 2007*). These rafts have proven to be the most successful method for the monitoring and trapping of mink and also save time. Monitoring and trapping will be performed according to best practice guidelines as stated in the water vole conservation handbook and TWT policy. (*Strachan R. & Moore T. 2003*)

5.1 MONITORING

Mink rafts will be deployed in 12 locations (figure 1). Five are in and around Bromsgrove town and 4-5 locations are in the Christopher Cadbury reserve at Upton Warren. The remaining 2-3 rafts will be deployed between the reserve and Bromsgrove and downstream of the reserve. Where proposed locations are situated on sites owned by private landowners, suitability of the location will depend on the permission and willingness of these landowners. Contacting landowners will be a joint responsibility between WWT and BDC.

A mink raft is a floating platform measuring approximately 2.4 x 1.2 x 0.6m. On top of the platform there is a tunnel. Within the tunnel there is a hole in the platform, which will be fitted with an open basket. This basket is then filled with florist-oasis and a clay/sand mixture. The oasis is in contact with the water and will keep the clay/sand mixture wet. Mink are curious creatures and will explore the tunnel. When exploring the tunnel they will leave their prints in the clay. Rafts can be checked by the landowner or BASC member (refer to section 5.2) once every week until the presence of mink is established.

Mink rafts can only be deployed with the permission and co-operation of the riparian landowner. Rafts should be placed outside the view of the general public to avoid vandalism and to increase the chance of trapping.

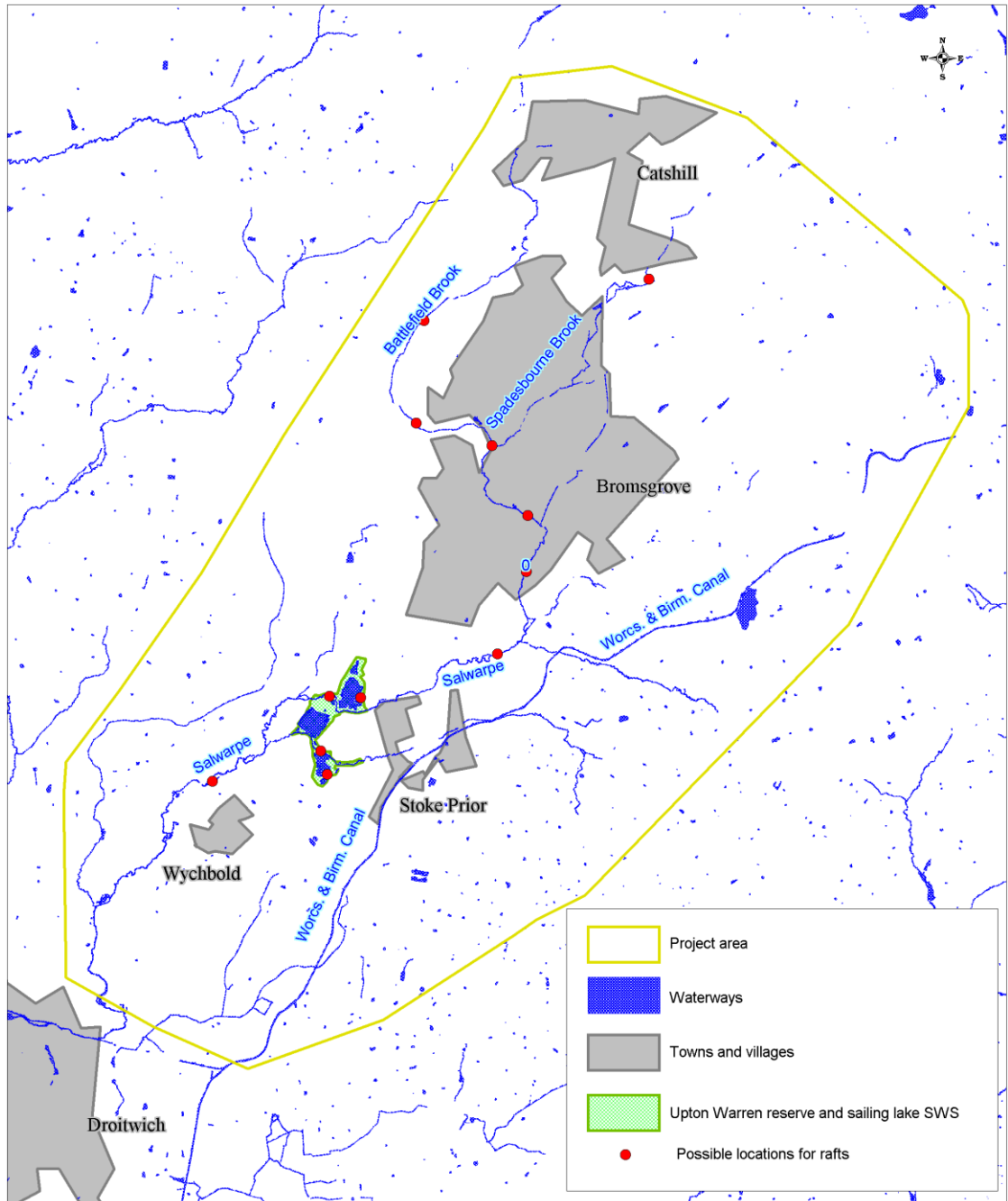


Figure 1. Outline of the project area and the proposed locations for mink rafts

5.2 TRAPPING

Once the presence of mink is established a live-trap (Albion, ALBI 009 tunnel trap) is secured in the tunnel, which will have to be checked at least once a day for animal welfare reasons. Using live-traps reduces the possibility of injuring and killing non-target species. Otter guards are fitted to the trap to exclude the possibility of trapping otters. If no mink is caught within a period of ten days the raft will be relocated.

Once a mink is caught it is an illegal offence to keep or transport a mink it under the Destructive Imported Animals Act 1932 and will therefore have to be dispatched. The only acceptable way of dispatching mink is by shooting. Shooting will have to be done by an experienced person that is licensed and experienced in the use of firearms. Since a part of the project area involves an urban area, safety has to be taken into account. When using an airgun within 50 feet of the centre of a public highway, it has to be ensured that no risk is caused to any member of the public using that highway to be injured, interrupted or endangered.

The trapping itself will be done with help from the British Association of Shooting and Conservation (BASC). Most of their members are experienced, licensed and skilled in the use of firearms. The person checking the trap will carry the tools to dispatch it immediately in order to reduce the time of mink being in discomfort.

The optimum time to trap is February-April prior to their breeding season. Trapping between August-November is another good time as this intercepts dispersing juveniles. Trapping should be avoided between mid-April and July as female mink are nursing young during this time. Separating dependent young from their mother is regarded not acceptable because of animal welfare.

5.3 HABITAT ENHANCEMENT

BDC is currently working to improve the management of their watercourses in order to create suitable habitat throughout their district. However, BDC is not the only riparian owner. Some work is undergoing with private landowners to improve habitat along the brook and to reduce fragmentation. Habitat creation in forms of backwater online pools and ditches around existing populations should be considered and appropriate funding should be identified.

In order to aid the recolonisation of water voles downstream, possible obstructions for dispersal will have to be investigated. The aim should be to remove all obstructions to natural dispersal to allow water voles to recolonise naturally. If this is found to be impossible, other means of aiding the dispersal might be considered, such as the relocation of water voles. Relocation is considered only as a last resort and can only be considered if the habitat of the receptor site is suitable for water voles and free of mink. Advice and support should be given to riparian landowners along the Battlefield Brook, Spadesbourne Brook, Sugar Brook and Salwarpe, to help improve riparian management and habitat for water voles.

6 TIME SCALE

Mink trapping will commence in November 2007. When the mink population is regarded to be under control, trapping could expand further downstream. Depending on the success of the recolonisation of water voles, the ultimate aim should be to trap mink throughout the Salwarpe catchment. Again, this will have to be supported and justified with improvement of the overall habitat. Monitoring for mink will have to be continuing to ensure the safety of the existing water vole population.

7 PROJECT MONITORING AND REVIEW

The presence of mink will be monitored weekly by the landowner, using the mink raft. Once presence of mink is positively identified by the landowner, the water and wetlands officer of WWT will be informed, who will then contact a trapper. The water and wetlands officer will record the number of mink identified, caught and killed on the Salwarpe and upper courses.

The water vole population will be monitored yearly during the first two years. This will be the responsibility of BDC and WWT. Success of the project will be reviewed yearly. This review will include:

- The numbers of mink monitored, caught and recorded.
- The amount of habitat sensitively managed, created and/or restored
- The distribution of the water vole population

The review will include the data recorded by BW regarding monitoring and trapping on the Worcester and Birmingham Canal. It will also suggest targets and actions for the coming year. These will be in line with the targets and actions as dictated by the water vole BAP.

8 TIME AND COSTS

Table 1 shows the costs of buying the materials for monitoring and trapping, WWT already owned 7 mink rafts, which will be used for this project.

Item	Costs
25 Kg clay	£ 24.11,-
25 Kg fine sand	£ 4,29
15 'handy baskets'	£ 4,95
Box of 20x oasis	£ 15,-
5 rafts (incl. clay, sand and baskets)	£ 295,-
11 traps incl. otter guards	£ 400.80,-
TOTAL	£ 744.15

Table 1. Material costs for monitoring and trapping

Table 2 shows the estimated time spent per activity.

Activity, September 2007 – April 2008	Estimated time needed	Work done by	Deadline
Contacting and instructing landowners	3 days	BDC, WWT	End 09.07
Methodology meeting with BASC volunteers	Half day	BDC, WWT	Half 10.07
Co-ordinating monitoring and trapping	1 day	WWT	Ongoing
Give habitat management advice to riparian owners	3 days	WWT, BDC	03.08
Train parks managers and mowers at BDC	1 day	BDC	09.07
Write water course management plan	2 days	BDC	12.07
Write project review	2 days	WWT, BW	06.07

Table 2. Workplan September 2007 – April 2008

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