

# NORFOLK MINK PROJECT

## CONTROL STRATEGY

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### Introduction

The Norfolk Mink Project (the Project) has been running for 8 years and over that period has developed in scope from an initial focus on the River Wensum and the Broads and gained considerable practical experience. This gradual development and the recent awarding to Norfolk of funds, via a collaborative EU project, mean that it is now appropriate to recast the aim of the Project and the strategy to be adopted to achieve this. The intention is that the revised Aim and Strategy will provide clarity for those funding, and those involved with the delivery of the Project until 2020. At this time a further fundamental review of progress will be needed.

#### **The aim of the Project is:**

To reduce mink population density to extremely low levels throughout the county, with as much of the area as possible being effectively free of mink.

#### *Recognising:*

- that there is good evidence that this will benefit native species such as water voles, particularly in association with other initiatives that maintain and enhance their habitat;
- that there is good evidence that community participation and adaptive management can remove mink from large areas;
- that total eradication will not be achievable while there is immigration into the county;
- that the strategy will need to be optimised for the long term and take account of the motivational and financial consequences of this;
- that the Project will need to engage with partners in neighbouring counties and nationally to promote and enhance the effectiveness of mink control and where possible promote this in the wider context of problems caused by invasive alien species;
- that the long term aspiration is for eradication throughout Norfolk as part of wider control of the species, with the Project acting as an exemplar for mink control and the control of Invasive Alien Species more generally.

## **Strategy**

The strategy will be to achieve the Aim of the Project by using resources to best advantage to facilitate mink control across the whole of Norfolk. In this the Project will adopt an adaptive approach using significant volunteer participation. This is a flexible model that adapts to changing circumstances and has been demonstrated as a successful approach in achieving the eradication of mink from large areas of Great Britain (Bryce et al., 2011).

The study by Bryce et al., (2011) also indicated that numbers of mink caught increased where there was greater connectivity with mink in other sub-catchments and, in their case, with productive mink habitat on the coast. This reinforces the intuitive assumption that total eradication is unlikely to be possible within Norfolk while there is immigration from adjoining counties. The Project will therefore need to plan for the long term and cope with continuing immigration.

The Project has initially chosen a further eight years as an appropriate period for the next phase and will use control tactics that facilitate long term participation by partners. The Project will work with neighbouring counties to try and reduce immigration and help maximise the biodiversity benefits of control. The current work along the River Waveney in conjunction with the Suffolk Wildlife Trust is a good example of such co-operation in action.

## **Governance**

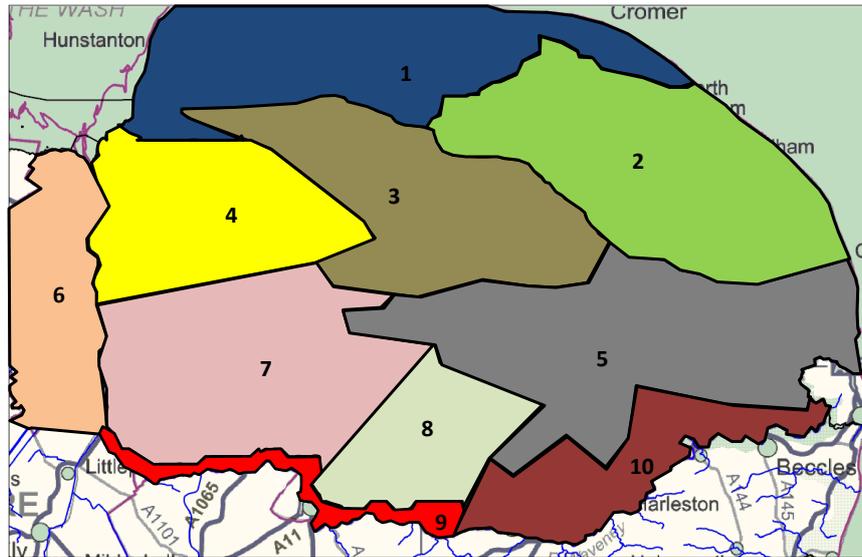
The Project is co-ordinated as part of the Norfolk Non-native Species Initiative and supported and funded by a number of other agencies including Norfolk County Council, the Broads Authority, Natural England, the Environment Agency, and the Water Management Alliance. It is guided by a Steering Group comprising key partners and individuals with relevant expertise. Day-to-day management is through the Co-ordinator of the Norfolk Non-native Species Initiative.

## **The Project Area**

The Project has developed from facilitating control on the River Wensum catchment, to now include the Broads, the rest of central Norfolk including the upper river Nar, Yare and Tas, and the river Waveney. With the recent success of the "RINSE" (Reducing the Impacts of Non-native Species in Europe) bid, mink control will be extended to the River Wissey. Given these developments, there is already control over a substantial portion of the county and it is now appropriate to develop a revised Aim and Strategy that encompasses the whole of Norfolk. The new Strategy will maximise the effectiveness of control by further reducing intra-county immigration. An objective is to have the whole county approach up and running effectively within the next 2 years.

To help the Steering Group better implement and manage the Strategy, Norfolk will be sub divided into ten 'Control Areas' (Figure 1). These are based on river catchments and designed to be 'relatively' discrete in terms of their mink populations, although in practice mink can move between them. The county has the advantage that immigration will

effectively only occur from the west and south, which should help maximise the proportion of the county that can be kept free of mink.



**Figure 1. Control areas based on catchments:**

- 1) North Norfolk Rivers, 2) Bure, 3)Wensum, 4) Nar, , 5) Yare, 6) Great Ouse, 7) Wissey & Cut Off Channel, 8) Thet, 9) Little Ouse, 10) Waveney

### Trapping Technique

Trapping will be based on the use of Game and Wildlife Conservation Trust rafts (Reynolds et al., 2004). These provide monitoring points and, when mink are detected, trapping locations. Mink are trapped on the rafts in cage traps and humanely killed as described by Bryce et al. (2011). Non target animals will be released unharmed.

### Control Tactics

Control will be based on the individual Control Areas. These will be classified annually on the status of their mink populations as:

- Red – mink regularly encountered in at least some part of the Area. Groups quite frequently detected and trapped.
- Amber – mink at a relatively low density, on average no more than 1 killed per 10 raft years in the Area during the year. There will be occasional groups detected and trapped.
- Green - effectively mink free, no mink trapped and no hard evidence for the presence of mink recorded.

The relationship with monitors and trappers partners in each area should reflect mink density and their overall chance of catching a mink since this has implications for the level of effort required and the sustained motivation of participants over the long term. It will be

necessary to ensure a reasonably even spread of monitoring activity, at appropriate levels, in every catchment, to ensure there is a reasonable knowledge of population density throughout the county. This may mean proactively targeting occupiers to become monitors and trappers where volunteers are not at sufficient density.

- In red areas trappers and monitors will be encouraged to actively engage with control for as much of the year as possible and the Project should aim to have rafts/traps at a reasonably high density (for example averaging every 2km along a main watercourse).
- In amber areas individual motivation is likely to be harder to sustain. Here the objective will be to maintain explicit long term relationships with monitors / trappers at key locations and encourage trapping at key times; for example when mink are detected by others in the area and at times of maximum mink movement. Other tactics such as rotating equipment between trappers/monitors might also be appropriate. The Project will aim for a lower trapping density than in red areas (for example averaging every 5km along a main watercourse).
- In green areas there will be little positive reinforcement from monitoring rafts but without any monitoring effort we are less likely to detect mink at low levels. Here the objective will be to develop explicit long term relationships with some key monitors / trappers such as conservation site staff or gamekeepers and encourage a monitoring-approach. Monitors are encouraged to focus efforts at key times of the year and look for mink sign in the environment. Trapping will normally be in response to mink sign. The Project will support the lowest density of rafts / traps in these areas, with rafts at key sites (for example averaging less than every 5km along a main watercourse)

In any area where mink are detected but nothing is caught within a relatively short time, additional trapping effort may be required. Equally, if an area of high mink activity is detected the Project may need to stimulate additional monitoring and trapping in that locality.

Records of mink sightings or signs can come in from both raft and non-raft locations, records might, for instance come in via the online non-native invasive species recording system. These are important to support planning both and the classification of areas (by presence or absence of reports), to focus trapping and to help motivate trappers in the particular area.

### **Measuring the outcomes in terms of mink control and the mink population**

For each trapping area we need to know the kill and trapping effort, as it is a change in numbers killed per unit effort that demonstrates the likely impact on a population. In isolation, numbers killed is of limited value as it may just mean that the population is rising.

For each raft / trap position each year we need to know:

<i>Area</i>	<i>Grid ref</i>	<i>Time in active use</i>	<i>Sign Recorded</i>	<i>No. mink killed</i>
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For each mink record that comes in through ‘Other Agencies’ we also need to know

*Area    Grid ref            Date    Type of record (sighting / dead animal)*

The data can be used to manage and develop control and report on progress in each area. The ideal outcome would be to have all areas to green but this would be extremely difficult given immigration and the limited resources available to the Project. However, it should be possible to see development of control effort in all areas over time and how effective the Project is at moving as much area as possible from higher to lower categories.

### **The Outcome of mink control for Native Species**

Invasive non-native species are the main direct cause driving biodiversity loss across the globe (Convention on Biological Diversity 2012) and many alien opportunistic predators have caused fundamental changes in ecosystems via their impacts on native species (Simberloff 2001). Specifically in relation to mink in Great Britain there is a body of scientific evidence that the presence of mink in water catchments has a detrimental effect on water vole populations and can lead to their local extinction in some cases (e.g. Halliwell & Macdonald 1996; Strachan C. 1998, Woodroffe 1994, Lambin 1996). Eastern England is a currently a relative stronghold for water voles, which have declined nationally by 94% in use of sites (Woodroffe, Lambin and Strachan 2008). It has been suggested that water voles may in future be confined to areas where mink are controlled (Woodroffe, Lambin and Strachan 2008). Mink are also noted as a major cause of the decline in water vole populations in the Norfolk Water Vole Biodiversity Action Plan (Norfolk 2002). Alongside the data on their impact there is also established good practice guidance on how control of mink can have a major beneficial impact on water vole populations (Strachan R. 1998). However, the relationship between predator and prey is not always straightforward as populations of water voles are also affected by other factors such as habitat quality, population fragmentation, or possibly through the resurgence of the otter population impacting on mink, all factors which are largely outside the remit of the Project.

Recognising the factors outlined above, the ultimate outcome of the Project is to promote biodiversity in Norfolk through the effective control of mink. However, in order to maximise the impact of limited resources, the Project will concentrate on mink control and measuring the impact that has on mink populations directly. It will encourage actions such as appropriate habitat management that also benefit water voles, but it will not seek to directly measure the outcome for water voles or other native species. We believe that there is sufficient evidence available that beneficial outcomes for water voles will accrue from good mink management and this will contribute significantly to the biodiversity outcomes sought for water voles in Norfolk (Norfolk Wildlife Trust, 2002).

It is also recognised that mink can have an impact on seabirds (Craik 1998) and waterfowl (Ferris & Macdonald, 1999) and are controlled by conservation managers to protect bird populations (the Broads is classified as a Special Protection Area). They are regarded as a pest by anglers, fisheries, gamekeepers and poultry keepers (Dunstone & Macdonald, 2008). Although the evidence for their wider impact in many of these areas is less clear than for

their impact on water voles (Dunstone & Macdonald, 2008), the affect of mink control is likely to be beneficial, at least locally, for these conservation and commercial ventures. People engaged with these are likely to be important partners in achieving the aim of the Project.

## Risks

There will always be a number of risks when launching an ambitious strategy and the following are some of the key ones identified. Key risks such as funding, stakeholder motivation and record keeping will be identified and mitigated or managed through the Project with the support of a Risk Register.

## References

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