

Creating ponds for water voles



A 50-YEAR PROJECT TO CREATE A NETWORK OF CLEAN WATER PONDS FOR FRESHWATER WILDLIFE

1. Introduction

Water voles have suffered a catastrophic decline in Britain over the last few decades. Changes in land use and management have resulted in loss and fragmentation of water vole habitat which has led to the loss of colonies, isolation of remaining populations and an increased vulnerability to predators, in particular feral American mink.

Making new ponds can help water voles, particularly where they provide habitats that:

- 1 **Extend or link existing water vole colonies**, helping to encourage spread, increase the size of populations and enhance chance of colony survival.
- 2 **Add complexity to wetland landscapes**, helping to confound hunting mink, which can eradicate water vole populations along simple linear features such as river banks.
- 3 **Provide a refuge for water voles during flood conditions**, in particular ponds not connected to water courses.



▲ Water voles forage on vegetation at the water's edge

2. Locating ponds

Create new water vole ponds near to existing populations to allow colonisation and spread from existing sites (see Figure 1). Ponds should be located as near to existing colonies as possible, up to a distance of around 1 km. Ideally, ponds should help to create or extend wetland complexes that include other ponds, ditches, rivers, backwaters or canals. Ponds provide good habitat for water voles, but often they are not used because the ponds are too isolated and/or too small. Creation of pond and wetland complexes that extend and link existing available habitats will be particularly good for water voles.

Key messages

- Locate ponds as near to existing water vole colonies as possible, up to a distance of around 1 km to allow colonisation and spread from existing sites.
- Minimum depth in new ponds created for water voles should be at least 1 m.
- Ponds created for water voles should have a minimum of a 50 m length of good quality bank-side habitat. A self-sustaining water vole population needs at least a 2 km length of such habitat.
- Create wide shallow-water zones 0 – 0.3 m deep which extend at least 2 m into the pond to encourage the marginal plants that water voles feed on.
- Manage woody vegetation on the pond bank by grazing or mechanical flail mowing approximately once every two years to prevent overshadowing.
- Manage bank-side vegetation in sections, staggered over time, so that areas of un-cut bank are retained for refuge.

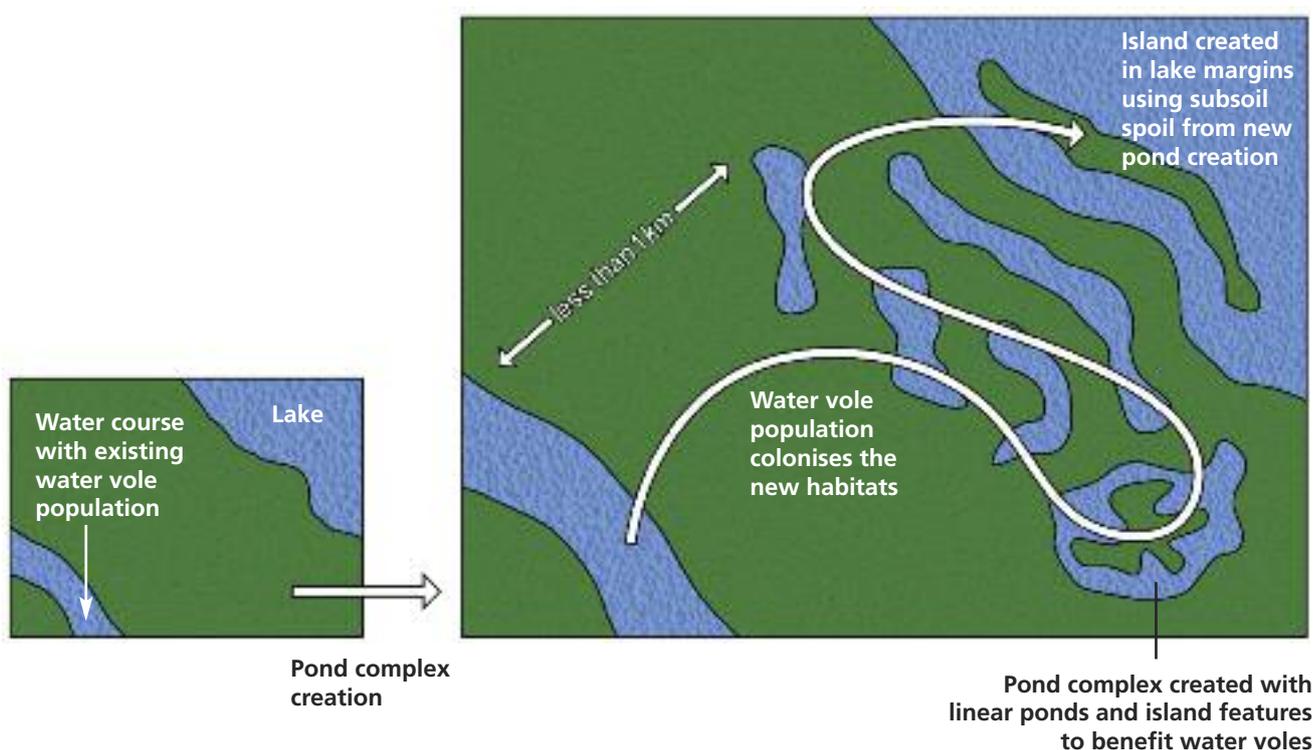


Figure 1. Locate pond complexes for water voles near to existing wetland features, such as water courses or lakes.

3. Water source

It is always best to ensure that new ponds are as clean and unpolluted as possible. However, water voles are not over-fussy about water quality: they are common on canals and rivers with turbid water and high nutrient levels. This is an advantage for pond creation in lowland Britain where good water quality can be a scarce resource.

Water levels should be relatively stable. Make ponds with an overflow to create a maximum water level which will ensure that water vole burrow systems are not flooded by high waters. Groundwater-fed ponds can be particularly suitable for water voles because when fed by aquifers, their water levels tend to fluctuate less than surface water ponds (see *Pond Creation Toolkit Factsheet 10*).

Ponds that are connected to water courses and those isolated from water courses can both be useful for water voles. Ponds connected to slow-flowing streams or ditches have good connectivity, they diversify the habitat, and enable water voles to move more easily across the landscape. However, stream and ditch-fed ponds often silt up rapidly, so if you create this sort of pond, consider plans for long-term management. Ponds not directly connected to river and ditch networks can provide useful refuges in times of flooding. They may also help water voles escape mink that can eradicate colonies along simple linear features such as rivers and ditches.

4. Pond shape, depth and size

Habitat creation for water voles could involve creation of a single pond, a complex of ponds or a mix of wetland habitats, including ponds and ditches, or modification of the edges of lakes and watercourses. In general, a number of small or medium sized ponds in close proximity are better than a single large pond of the same area.



Ponds created specifically for water voles should ideally be at least 1 m deep at low water level. This allows water voles to dive down to escape predators.

Ponds which have banks more than 10 m apart, without islands, are often avoided by water voles, perhaps because the far bank is too distant for the voles to use for foraging and burrowing. In ponds and lakes, islands are particularly valuable for water voles; they provide protection from terrestrial predators and also create additional bank habitat. A large round pond will only have one bank available for foraging and burrowing, whereas a long linear pond or a pond with islands will have two banks available to swim between. Ponds wider than approximately 10 m would benefit from the addition of islands to increase the bank-side habitat available and provide accessible shelter from predators.

Ideally, islands created for water voles should be designed not to become submerged during high water levels. However, without management, islands that are dry throughout the year will scrub over in time, which will reduce the amount of vegetation available for foraging. Therefore, some form of access onto the island for management works will be necessary for long-term maintenance of the water vole habitat. This could be as simple as a removable plank of wood. If access for occasional cattle grazing or machinery is required a shallow causeway connecting the island to the surrounding land may be necessary, however, this will not be as effective at keeping out terrestrial predators.

A pond scheme designed for water voles should, as a minimum, have enough bank-side vegetation to support one water vole breeding unit. A breeding female requires a minimum of a 50 m length of good quality bank-side habitat. This equates to a round pond with a diameter of 16 m (which should ideally have an island), or a linear pond around 25 m in length. A minimum of 30 breeding units are required for a self-sustaining population of water voles, and this equates to at least 2 km of available bank-side habitat.



▲ Water voles don't like to swim more than 10 – 15 m across open water.

5. Banks and edges

Design of the shallow-water edge area is critical. Water voles need extensive, thick fringes of tall wetland plants. Extensive stands of marginal vegetation are used both as foraging habitat and as protection from predators. Suitable plants such as sedges (*Carex* spp.), branched bur-reed (*Sparganium erectum*) and reed sweet-grass (*Glyceria maxima*) grow best in shallow water 0 – 0.3 m deep and so new ponds should be designed to have extensive shallow-water zones that extend at least 2 m into the pond. Areas with steep banks that open on to deeper water are also valuable to provide quick escape routes.

Above water level, pond banks need to be mainly clay, silt or earth so that water voles can burrow in to them easily and create nest chambers above the water table. Steep or stepped bank faces, close to the water are often preferred areas for burrows (see Figure 2).

The pond banks should generally be well covered by tall vegetation. Multi-layered mixes of tall grasses and herbs such as meadowsweet, willowherb or nettle are best.

Occasional trees such as willow and hawthorn are also useful to provide bark and roots for winter feeding. However, too many bank-side trees or shrubs will create problems by shading out vegetation, thus reducing access to forage and protection from predation for water voles.

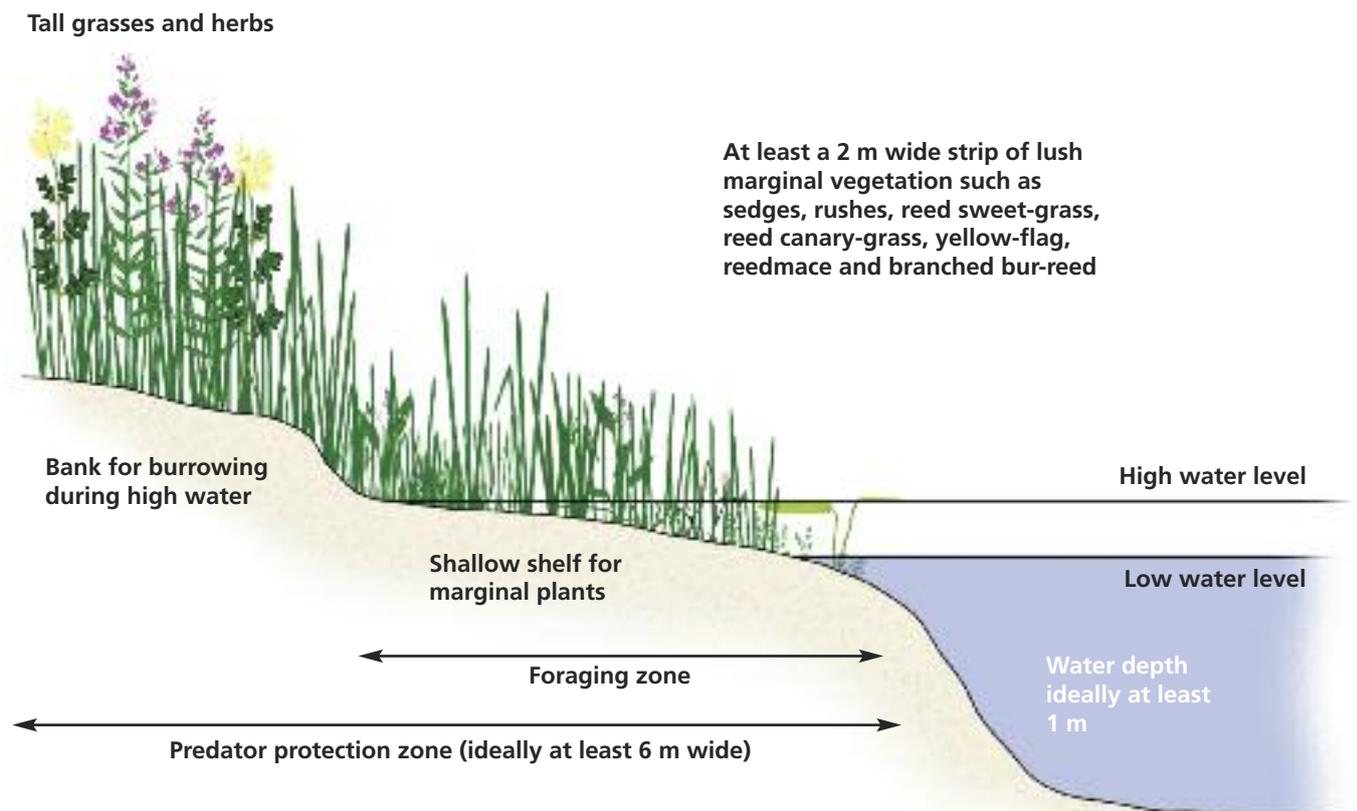


Figure 2. Suitable bank profile for water voles.

6. Planting-up

Planting up ponds is generally to be avoided (see *Pond Creation Toolkit Factsheet 8*). If the right bank structure is created, appropriate plants will usually colonise within a few years. However, there may be advantages in introducing some favoured plant species if there is a need for rapid colonisation to benefit water vole populations at risk. If so, use only native plants of local provenance, and take particular care not to introduce invasive alien plant species. Also avoid using some of our more invasive native plants, such as common reed (*Phragmites australis*). Water voles eat a wide range of wetland plants, including common reed, but it is not a favoured food plant.

Plants that are particularly valuable for water voles include reed-canary grass (*Phalaris arundinacea*), *Carex* spp. and yellow flag (*Iris pseudacorus*). Greater tussock sedge (*Carex paniculata*) provides excellent habitat for water voles; tussocks provide a platform upon which water voles can sit and eat and, if sufficiently large (approx. > 60cm diameter) they can provide a structure into which voles can burrow and nest. They can also be used as a refuge during flood conditions.



7. Vegetation management

It is important that ponds are left to develop the tall, thick marginal vegetation that water voles need. If the pond surrounds are grazed by stock then most of the pond margins may need to be fenced against this, although it is sometimes possible to allow permanent grazing if the stocking level is very low.

Occasional management may be needed to prevent excessive shading from tree or scrub growth on pond margins. Grazing or mechanical flail mowing of the pond banks approximately once every two years will be sufficient to manage woody vegetation. Management of bank-side vegetation should be undertaken in sections so that areas of un-cut bank are retained for refuge. Over zealous mowing up to the pond edge should be avoided.

8. Mink control

If ponds are being created specifically to enhance the conservation status of water voles in an area, it may be appropriate to consider whether additional mink control might also be beneficial to the water vole population.

Any mink control project aimed at helping water vole conservation needs to be properly carried out and monitored by experienced personnel. Proposals for mink control for water vole conservation should be sent to the UK Water Vole Steering Group for endorsement (see Useful contacts below). It is also recommended that the local wildlife trust is consulted – many wildlife trusts have a water vole project officer and will be able to advise in detail on the status of water vole and mink populations, and mink control measures in your area. If mink control is to be undertaken as part of a management strategy, it must be carried out strictly in accordance with best practice guidelines (see Further reading).

Useful contacts

UK Water Vole Steering Group
Lead agency: Environment Agency
www.environment-agency.gov.uk

The Wildlife Trusts
www.wildlifetrusts.org

Further reading

Strachan R. and Moorhouse T. 2006. *Water Vole Conservation Handbook* (2nd edition). Wildlife Conservation Research Unit, University of Oxford.

Game & Wildlife Conservation Trust Mink Raft Guidelines (available to download from www.gwct.org.uk)

For further information about the Million Ponds Project and to consult the Pond Creation Toolkit, please visit www.freshwaterhabitats.org.uk/projects/million-ponds



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This factsheet was prepared in consultation with Julia Armstrong and Dr. Tom Moorhouse.