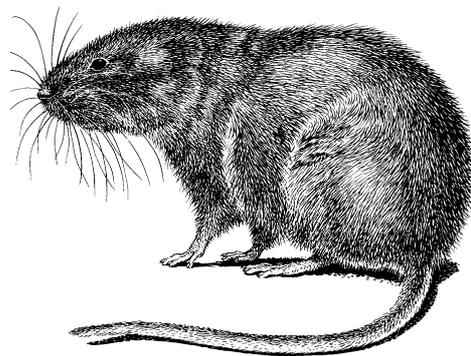


Species Action Plan for Sussex

Water Vole

Arvicola terrestris *ssp amphibius*



1. Introduction

The Water vole is a high priority 'Flagship species' and measures to conserve the species can provide many other biodiversity targets for wetland habitat and species conservation. Fragmented and isolated populations remain in the county which are currently vulnerable.

1.1 Habitat Requirements and Ecology

Water voles (*Arvicola terrestris ssp amphibius*) can be found in the majority of British freshwater habitats, from marshland and small flushes to ponds, lakes, streams, canals, ditches and rivers. They may also occur, (though often at lower densities), within dry ditches, hedgerows and at the edges of saltmarsh. Sites that are heavily shaded often have reduced herbaceous cover and tend to be less favoured (Strachan & Jefferies, 1993).

Water voles feed primarily on lush waterside vegetation, especially grasses, sedges, rushes and reeds, and habitats containing vegetation of this type (particularly those with over 60% herbaceous ground cover) are favoured. However, their diet varies seasonally, and in the winter months roots, bark, rhizomes, and bulbs provide vital food sources. In spring, aerial leaves, buds and shoots may be taken, and in autumn fruits are also included. Studies by Strachan *et al* have shown that their diet consists of at least 227 known species. Water voles need to eat up to 80% of their body weight daily, thus a secure food source is extremely important.

The densest water vole populations therefore tend to be found where water and a food source is permanent throughout the year. Sites that retain water throughout the year, especially during summer low flows are particularly favoured, while sites that suffer from flooding over long periods are not. Slow moving or still water courses of approximately 3m width and 1m depth, where water levels do not fluctuate greatly are preferred.

In Sussex, remnant populations tend to be found along floodplain ditch systems. However the linear and interlinked nature of these systems encourages predation and colonisation by American mink (*Mustela vison*). Healthy ponds and lakes isolated from main water channel systems can therefore provide refuges for remnant water vole populations as these are less easily colonised by mink. Reedbeds and fens, river catchment headstreams and small backwaters can also hold very good populations. Sites where remnant populations exist seem to have experienced lower mink predation or are better buffered against it. Some heavily kept areas (where mink predation is reduced) retain water vole populations.

In general, where soil conditions permit, water voles will excavate (with their teeth and feet) burrow systems along the water's edge. The favoured bank type is earth, as this allows easy burrowing,

particularly if this has a stepped or steep inclined profile. Water voles are unable to burrow into rocky or gravely substrates or where banks are reinforced or are flooded for protracted periods.

Burrow systems generally consist of residential burrows (with many entrances, inter-connecting tunnels, storage areas, bolt holes, and nest chambers), made up of short tunnels ending in a single chamber. Burrows can extend for 3 metres or more into the bank and entrances are also found below the water level. In the warmer months, especially in reedbeds, water voles may produce woven nests of vegetation above ground. These nests are approximately moorhen nest sized (a small football) and general woven into tussock sedges or vegetation of a similar nature.

Water voles are territorial in the breeding season (March-October) and during this time, females mark out exclusive areas along watercourses. The length of territories can vary from 20-300m depending on overall population density, season, habitat quality and the sex of the animal. The territories of males are larger and generally overlap that of several females. 'Territory ranges are marked by discrete latrine sites within, and at the boundaries of the female territory, large latrines can be found that the male mate scent marks'. (Strachan 1997)

Females can produce between 2 and 5 litters annually, generally of between 2 and 6 young (although exceptionally up to 10) which are weaned after 28 days. Five is the most common number of young, with litter sizes decreasing with breeding later in the year. The male is generally chased out to a separate nest chamber in the burrow before the young are born. Those young born in the spring may reach sexual maturity in the same year, but most breed the following year. Mortality is commonly around 70% (or higher) over winter. Average life expectancy is less than 6 months because of the high juvenile death rate, though occasionally an individual will survive in the wild for three winters.

1.2 Current distribution in the UK & Sussex

Water voles are currently the fastest declining mammal in Britain.

In the British Isles, the water vole was formerly widespread and common. However, there has been a gradual decline in populations for at least the last 70 years due to habitat loss, degradation and fragmentation. This process accelerated after the Second World War with the intensification of farming. In the last three decades mink predation has been a significant factor in the further decline of water vole populations.

The first National Water Vole Survey, funded by the Vincent Wildlife Trust, was undertaken in 1989/90 and repeated during 1996/98 (Strachan & Jefferies, 1993; Strachan *et al.*, 2000). The first survey indicated that water voles had been lost across Britain from some 68% of sites since 1939. The second survey revealed that this loss had continued and had actually accelerated; water voles being lost from 88% of those sites which had held them only seven years previously. The water vole is now on the point of extinction in several counties.

In Sussex, the first National Survey carried out during 1989/90 found that 71% of sixty three sample sites had positive signs of water voles. By the time of the second National Survey, in 1996/98, only three sites were still positive. A report commissioned by the Environment Agency in 1998 concluded that the species was on the brink of county-wide extinction (Ryland, 1998).

1.3 Summary of Important Sites

Water vole populations currently exist in a few pockets in West Sussex in the Chichester/Pagham coastal plain between Pagham and Emsworth (Rob Strachan - approximately 100 individuals pers comm) and in East Sussex around Rye (probably a more healthy population linked to Romney

Marsh, Kent). Elsewhere across both counties water voles appear to have been lost almost completely, with only a few remnant populations continuing in the more isolated or urban areas (Booth, 1998; McConnell, 1998; Jennings & Bramley, 2001).

Water voles were re-introduced to the Wildfowl and Wetland Trust on the River Arun in a combined initiative between WWT, the Environment Agency and Sparsholt College following their extinction in this area. The population was re-introduced to the site in autumn 1999 and spring 2000 and the success of the various release techniques has been monitored. Unfortunately the flooding in 2000/2001 has seriously reduced the size of the colony, and research work will be carried out in April 2002 to monitor if any water voles have survived.

Another population was confirmed on the Cuckmere River (2001) but is thought to have perished overwinter, and it is likely that there are remnant populations in and around Pevensey levels. Reported sightings will be followed up in 2002 at other sites. All remnant populations are extremely vulnerable.

1.4 Legal and Conservation Status

- Habitats Directive; - The water vole is not listed as having European conservation status and so is not incorporated specifically into Habitat Directive requirements. Other conservation measures implemented for other wetland species and habitats may however help the water vole in broad terms (i.e. the Reedbed, Farming and Wet Grassland HAPs and the Otter SAP). The water vole is also listed under the Bern convention Appendix 2.
- In April 1998 the water vole was given protection under Schedule 5, Section 9(4) of the Wildlife and Countryside Act 1981 (amended 1998). Section 9(4) of this Act makes it an offence to intentionally damage, destroy or obstruct access to any structure or place that water voles use for shelter or protection. It is also an offence to disturb water voles while they are using such a place. A current review is underway (2002), to allow the full protection of the water vole under this legislation. Pending legal protection, a licence must be sought from English Nature if you intend to trap or radio track water voles. (Strachan 1997).
- The CROW act updated the Wildlife and Countryside Act to the amended phrase ...'offence to intentionally, or recklessly, damage, destroy
- As a protected species, the water vole is covered in the UK by the DETR Planning Policy Guidance notes (PPG9) which requires that the presence of this species be given material consideration when determining planning applications.
- The water vole is protected from persecution under the Wild Mammals (Protection) Act 1996.
- The water vole is a Priority Species for conservation under the UK Biodiversity Action Plan (DoE 1995) and is listed as BAP list 1 – endangered. A National Species Action Plan has been produced (WVSG, 1997).
- The water vole is listed as a UK Red Data Book species (Morris, 1993) EC Annex 2 & 3.

2. Current Factors Causing Loss or Decline

The decline in the water vole population has been nationwide due to a number of factors acting cumulatively.

2.1 Habitat degradation

(Importance: High)

Heavy grazing and bankside trampling by domestic stock

Heavily grazed sites tend to be denuded of luxuriant growth and are often heavily poached. In these sites water vole burrows are often collapsed, the bank profile is altered and there is little riparian vegetation.

Unsuitable management/Waterway maintenance

Unsympathetic bank and channel maintenance can be destructive to water vole habitats, particularly when carried out with heavy machinery. Inappropriate spreading of soil can smother borrow systems and foraging areas and encourage the dominance of low diversity riparian vegetation. Extensive bank reinforcement involving sheet piling or concrete destroys water vole habitat, removes emergent vegetation and denies animals burrowing opportunities.

Repeated close mowing and strimming of vegetation on the banks of ditches and streams removes cover, facilitates predation and reduces food supply. Conversely, a lack of management can ultimately result in the loss of water vole habitat through the scrubbing over and heavy shading of watercourses, or through the dereliction and siltation of ditches.

River/wetland engineering

Across the UK (especially during the last 100 years), large scale widening, straightening and deepening of rivers has had profoundly damaging impacts on riparian ecosystems. Small-scale drainage schemes (i.e. associated with farming), which were encouraged during the 1950s, 1960s and 1970s, have further reduced both the quality and extent of many wetland habitats.

Development and recreation

Developments that involve loss of riparian habitat can adversely affect water vole populations; particularly damaging developments include culverting, hard banking, inappropriate landscaping and planting. Increased levels of powered boat traffic on navigable waterways can cause reduction in water vole populations due to loss of marginal plants and increased bank erosion.

2.2 Fluctuations in water level

(Importance: High)

Access by water voles to food, cover and burrows are affected by water level fluctuations. The magnitude and frequency of water level fluctuations has increased due to changes in land use and drainage, flood defence engineering and water abstraction. Low summer flows have been exacerbated and winter flash floods increased. Very high water levels often causes high mortality (through increased predation/starvation) as water voles are forced out of inundated burrow systems.

2.3 Population fragmentation

(Importance: High)

Survival of water vole populations, especially following local declines, often depends upon the movement and exchange of individuals between neighbouring colonies and habitats. Many of the above can result in the separation of remnant populations into isolated 'islands'. Due to the variable reproductive capacity of water voles, together with the high mortality rates over winter, this leaves them more vulnerable to unpredictable stochastic events and extreme environmental conditions. Opportunistic mink predation of fragmented populations can subsequently result in local population extinctions.

2.4 Predation

(Importance: High)

Predation by American mink (*Mustela vison*) is a major influence on the current distribution of

water voles in the UK. Mink are an effective predator of water voles and often hunt in a linear fashion along the edge of waterways where water voles occur. Female mink are small enough to enter water vole burrows and when rearing young, may specialise in capturing water voles.

There is some evidence that the quality and extent of the riparian habitat, for example expansive wetlands and reedbeds, does mitigate to some extent the impact of mink predation. However, it appears that only in very few situations can water vole and mink populations coexist over extended time periods (Rob Strachan, pers comm). Other predators of water voles include fox, heron, weasel, pike, brown rat, hawks and owls and domestic cats.

2.5 Pollution

(Importance : Undetermined)

A variety of contaminants have been introduced into the aquatic environment during the last 100 years, including heavy metals, oestrogen mimics and organochlorine insecticides, their effect on water voles is largely unknown, although pollution can affect breeding success and immune system function. Distribution data of water voles indicates that this species may be fairly tolerant of poor water quality.

2.6 Persecution

(Importance : Undetermined)

Water voles are easily confused with brown rats and are susceptible to rodenticide poisoning. Water vole colonies are known to have been lost to improper rodenticide use.

2.7 Disease

(Importance : Undetermined)

There is no current evidence that disease has played a part in water vole decline.

2.8 Competition

(Importance : Undetermined)

No detailed study has yet been undertaken to determine the interactions between water voles and brown rats (WVSG, 1997). Although adult brown rats are known to prey on water voles, co-existence over several centuries would suggest that brown rats are not the major factor currently influencing water vole decline.

3. National Species Action Plan

A UK Species Action Plan was produced by the UK Water Vole Steering Group in July 1997 and should be consulted for further detail. The key Aims of that Plan (which are subject to review) are:

- Maintain the current distribution in order to arrest the decline of the species in Britain
- Maintain the current abundance in order to arrest the decline of the species in Britain.
- Restore water voles to their former widespread distribution, using the Vincent Wildlife Trust Survey of 1989/90 as a baseline, by the year 2010.

It is proposed that these aims will be achieved through specified objectives and targets, which themselves are attained by undertaking a number of proposed actions. The key objectives, targets and actions of the National Water Vole SAP (in addition to the main aims) are:

- To incorporate water voles into any relevant existing or new national and regional policies (including agri-environmental schemes). This has already been partially achieved by the inclusion of this species on Schedule 5 of the Wildlife and Countryside Act.
- Identify large, viable breeding populations of water voles and retain these with appropriate

management and monitoring as key and designated areas.

- Incorporate water vole conservation into area management plans (e.g. local BAPs and LEAPs).
- Ensure that development schemes do not affect the integrity of water vole populations.
- To continue conservation research and survey (including repeats of the National Survey) for the water vole. Use this information to establish the ecology and conservation requirements of water voles and also to determine the extent of water vole populations, level of fragmentation and identify of re-establishment sites.
- Where necessary employ appropriate mink control as a conservation tool to protect large breeding water vole populations.
- Establish a co-ordinated programme of translocation and re-introduction of water voles with local provenance, where it is deemed appropriate and effective.
- Ensure information on water vole conservation requirements and appropriate habitat management is available to all riparian landowners, managers and advisors.
- Promote European co-operation in the study and conservation of threatened populations of water voles.
- Encourage the submission of data collated on a local level to Local Records Centres for incorporation into a national database and to facilitate easier access to information.
- To encourage the publication of material to raise the profile of the species.
- To prepare educational resource material for nation-wide distribution.

4. Current Action

A full analysis of the last National Survey (1996-1998) has been undertaken, leading to the publication of a mink control statement by the UK Water Vole Steering Group (UKWVSG) in Nov 2001. The statement concluded that “without strategic mink control being carried out in combination with habitat enhancement, we will lose the water vole from the vast majority of the British countryside in our working lifetimes”.

The statement outlines mink control guidelines for water vole conservation, and highlights 9 key ‘defendable’ priority areas for mink control, based on river catchments. The Kent and Sussex coast is one of these key areas. The UKWVSG will work with WildCRU to model the impacts of mink control in the 9 priority areas. A national co-ordinator would oversee this work.

Best practice procedures in habitat management for the conservation of the water vole are outlined in *The Water Vole Conservation Handbook* (Strachan, 1998), and this document is supported by a range of published material on habitat management (e.g. Holmes, 1994; RSPB *et al.*, 1994). A booklet on habitat management techniques for water voles and otters in Sussex has been produced by the Sussex Otters and Rivers Partnership (2001) and this compliments material on water voles already published by Hampshire Wildlife Trust (Hampshire Wildlife Trust, 2000).

‘The Mink and the Water Vole: Analysis for Conservation’ was published in 1999 (Macdonald & Strachan, 1999) and this document draws together all current research on the interaction of these animals.

The Sussex Wildlife Trust has published a statement on the control of mink for conservation purposes. The Wildlife Trusts UK has also produced a national position statement on the control of mink for water vole conservation.

Guidance on water voles for planners and developers and a fact sheet on water voles have been produced by English Nature (EN, 1998, 1999).

A leaflet highlighting the potential risk of rat control methods to water voles has been published (BBONT, 1999).

The People's Trust for Endangered Species and English Nature also recently investigated water vole decline, using National Key sites a strategy for water vole conservation was designed. (Bright & Carter, 2000).

During 1997-98 the Wildlife Trusts organised the Water Volewatch project; which was the first nation-wide water vole survey to involve schools, junior wildlife groups, anglers and other members of the public. Over 1,000 survey forms were completed in this project and relevant records of water voles distributed to each county Trust.

In Sussex much of the pro-active water vole conservation work is being undertaken by reserve managers, landowners and other conservation organisations. In particular, the Environment Agency, Sussex Wildlife Trust, Sussex Otters and Rivers Partnership, British Waterways, the Western Rother Valley Project, the Farming and Wildlife Advisory Group (FWAG), WildCru, English Nature and the Wildfowl and Wetlands Trust. Many landowners and organisations are now actively trapping mink.

In West Sussex, WildCru, Pagham Harbour Nature Reserve and FWAG are currently working with other organisations on water vole conservation in the Chichester Coastal Plain Project. On the East Sussex/Kent border, the Environment Agency, Rye Harbour Nature Reserve, Romney Marsh Project and others are working to protect existing water vole populations by encouraging appropriate and sympathetic habitat management and mink trapping.

Funding for water vole conservation comes from a variety of sources including English Nature's Species Recovery Programme and biodiversity grant scheme, from the Environment Agency, Countryside Stewardship and other agri-environment schemes.

5. Objectives

1. To arrest and reverse the decline of the water vole in Sussex
2. To identify and subsequently ensure, the long term protection of existing Key Sites for water voles in Sussex
3. Finding all remnant populations of water vole in Sussex, (preferably one in each catchment area), and to restore them to viable populations.
4. Minimising the risk to water voles of pest control procedures
5. Ensuring appropriate and sympathetic management of watercourses and wetland habitats for water voles (and in general) across Sussex through the dissemination of information to landowners etc.
6. Using the water vole as a flagship species for good riparian and wetland habitat management, and for wetland restoration.
7. To develop a strategic mink control policy based on key site conservation.

6. Targets and Costs

This Species Action Plan is now archived

7. Action plan

This Species Action Plan is now archived

8. Monitoring/Review

This Plan is a working document. It is proposed that a Sussex Water Vole SAP Working Group meet on an annual basis to assess and monitor the implementation of this Plan. Concurrent with this annual meeting, the Plan will be reviewed by the Lead Agency (EA) in conjunction with the Sussex Biodiversity Partnership and updated and amended as necessary. The Sussex Biodiversity Records Centre will hold all records passed to them by the SORP, EA etc.

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10. Consultation

The first draft of this SAP was produced in July 1998 by Mark Elliott, of the Environment Agency, Kate Ryland, of Dolphin Ecological Surveys and John Patmore, of English Nature. That document was circulated within the EA (Sussex Area staff) and to West Sussex County Council, Sussex Ouse Valley Project, Arun Valley Project, Sussex Wildlife Trust, English Nature, Pagham Harbour Nature Reserve, East Sussex County Council, SE Otters and Rivers Project, WildCru, Sparsholt College, Farming and Wildlife Advisory Group and others. Comments received on the first draft have been incorporated into this the second draft.

The second draft has been circulated to all recipients of the first draft and in addition to:

South East Water

FRCA
Chichester Harbour Conservancy
Rye Harbour Nature Reserve
Kent Area EA
Kent Wildlife Trust
Surrey Wildlife Trust
Hampshire EA
Thames EA
Highways Agency
Railtrack
Sussex Mammal Group
Western Rother Valley Project
Sussex Downs Conservation Board
Sussex Ornithological Society
Sussex Biological Records Centre
Sussex Amphibian and Reptile Group
Romney Marsh Countryside Project

In this second round of consultation, organisations that work mainly outside Sussex, such as EA (Kent), have been asked for comments. It is hoped that this will ensure that the Sussex water vole SAP and its Objectives/Targets are consistent with the SAPs and initiatives being undertaken in surrounding areas.

11. Appendices

Contacts for advice

Advice on water vole conservation and sympathetic habitat management of waterways and wetlands in Sussex can be obtained from:

Environment Agency (Sussex Area)
Conservation Team, Saxon House, Little High Street, West Sussex, BN11 1DH
Telephone: 01903 703850

Environment Agency (Kent Area)
Conservation Team, Orchard House, Endeavour Park, London Road, West Malling, ME195SH. Telephone:-
(01732) 875587

Sussex Otters and Rivers Partnership Officer
The Lodge, Arlington Reservoir, Berwick, Polegate, East Sussex BN26 6TF
Telephone: 01323 870810

Grant information can be obtained from the above contacts and also:

Farming and Wildlife Advisory Group
Plumpton College, Lewes, East Sussex, BN7 3AE
Telephone: 01273 891190

English Nature Biodiversity Grant Scheme
Northminster House, Peterborough, PE1 1UA
(01733) 455101

Best practice procedures for habitat management and planning guidance can be found in:

English Nature. 1999. *Water vole. Guidance for planners and developers*. English Nature: Peterborough.

Sussex Otters and Rivers Partnership 2002. *Water vole guide for landowners. Habitat management techniques*. (as above).

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Sussex Otters and Rivers Partnership (2001). *Otters and water voles*. Sussex Otters and Rivers Partnership, The Lodge, Arlington Reservoir, Berwick, Polegate, East Sussex.

Glossary of abbreviations used:

BAP = Biodiversity Action Plan

BBONT = Berkshire, Buckinghamshire and Oxfordshire Nature Trust (now Wildlife Trust).

DEFRA = Department for Environment, Food and Rural Affairs

DETR = Department of Environment, Transport and Regions

DoE = Department of the Environment (now DETR)

EA = Environment Agency – Kent and Southern regional offices

EN = English Nature

FRCA = Farming and Rural Conservation Agency

FWAG = Farming and Wildlife Advisory Group

HA = Highway Authority

HAP = Habitat Action Plan

IDBs = Internal Drainage Boards

KBAPSG = Kent Biodiversity Action Plan Steering Group

LAs = Local Authorities

LBP = London Biodiversity Partnership

LEAP = Local Environment Agency Plan

PHNR = Pagham Harbour Nature Reserve

RHNR = Rye Harbour Nature Reserve

SAP = Species Action Plan

SBRC = Sussex Biological Record Centre

SMG = Sussex Mammal Group

SOS = Sussex Ornithological Society

Surrey WT = Surrey Wildlife Trust

SussexORP = Sussex Otters and Rivers Partnership

SWT = Sussex Wildlife Trust

WVSG = Water Vole Steering Group (National)

WRVPO = Western Rother Valley Project Officer

WWT = Wildfowl and Wetlands Trust

Acknowledgements

The Sussex Otters and Rivers Partnership would like to thank all those individuals and organisations who have assisted so far in the production of this Species Action Plan. It is hoped that the focus brought to water conservation by this plan and the work already being undertaken by several groups will enable the water vole to continue as an extant species within Sussex.