Water Vole (Flagship) Species Action Plan

"I wish a water-rat would glide,
Slowly to the other side;
Or a dancing spider sit,
On the yellow flags a bit"

On the Bridge, Kate Greenaway (1885)

1 Aims

- To reverse the local extinction of water voles on the Hogsmill and strive towards supporting self-sustaining, viable and thriving populations by utilising evidence-based conservation actions.
- Promote water voles as a 'Flagship Species', to encourage a wealth of beneficial conservation practices that support an array of other less known and less *charismatic* species.
- To raise the awareness amongst Council Officers and the public of the importance of water voles to encourage greater levels of council & community driven conservation and appreciation across the borough.

Acknowledgements

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2 Introduction

Water Voles (*Arvicola amphibius*) are one of the UK's most endearing and charismatic mammals, immortalised in British culture in famous tales such as The Wind in the Willows; Ratty was indeed a water vole and not a rat. Water voles therefore hold a special place in British hearts. However, they are sadly the UK's fastest declining wild mammal and without proactive conservation measures, they will likely become extinct. The research demonstrates that water voles have suffered extreme population declines, with an estimated loss of 97% of their populations in the last 30 years and less than 77,000 individuals estimated to be living across the UK.

Water voles are the largest of the four vole species native to the UK, with males weighing up to 350g and females being slightly smaller. They are typically associated with rivers where they can dig into the banks to create elaborate burrows. These herbivores have an incredibly broad diet and have been recorded to eat 227 species of plant.

Kingston has an interesting history entwined with the water vole. In 1851 the famous pre-Raphaelite painter John Evert Millais painted the background of Ophelia on the banks of the Hogsmill. Inspired by the teaming population of the time, Millais decided to include a water vole in his painting paddling next to Ophelia, after his assistant had fished one out of the river. However, due to the disapproval of his peers who also mistook the water vole for various other animals, Millais decided to paint it out of the final piece. In more recent years (approximately 30 years ago) local residents remember a time where water voles populated the river in good numbers, enriching people's daily lives.

The last water vole was recorded on the Hogsmill in 2017 at the Hogsmill Sewage Treatment works. In 2018, the local conservation organisation 'Citizen Zoo' set up the 'Get InVOLEd' project, which has empowered the community to conduct habitat and mink surveys, river restoration projects and successful fundraising campaigns. This progress alongside the work of the Hogsmill Catchment Partnership means that in August 2022, 101 water voles were reintroduced to the river.

As with the other species highlighted in this biodiversity action plan water voles are an 'umbrella' species, meaning conservation action that directly benefits water voles will have positive reverberations to the wider health of the ecosystem.

3 Current status

a. **Legal / policy status** – Water voles are fully protected under section 9 of the Wildlife and Countryside Act 1981 (as amended). Schedule 5 of this act makes it an offence to intentionally kill, capture or injure water voles and to intentionally or recklessly damage, disturb or obstruct access to their burrows. Water voles are also a species of principal importance under the Natural Environment and Rural Communities (NERC) Act 2006. Local authorities and other public bodies therefore have a legal duty to take their conservation into account. They are also a material consideration in the planning process.

b. **Conservation status** - Water voles are classed as being vulnerable to extinction in Great Britain and are endangered in England. As such, they are a priority species in both the London and UK Biodiversity Action Plans. A programme to reintroduce them to the Hogsmill catchment is currently underway.

c. **Distribution -** Note that this map depicts records from the last 20 years. In 2019. water voles were considered to be extinct in the Hogsmill catchment but were reintroduced to the river in 2022.

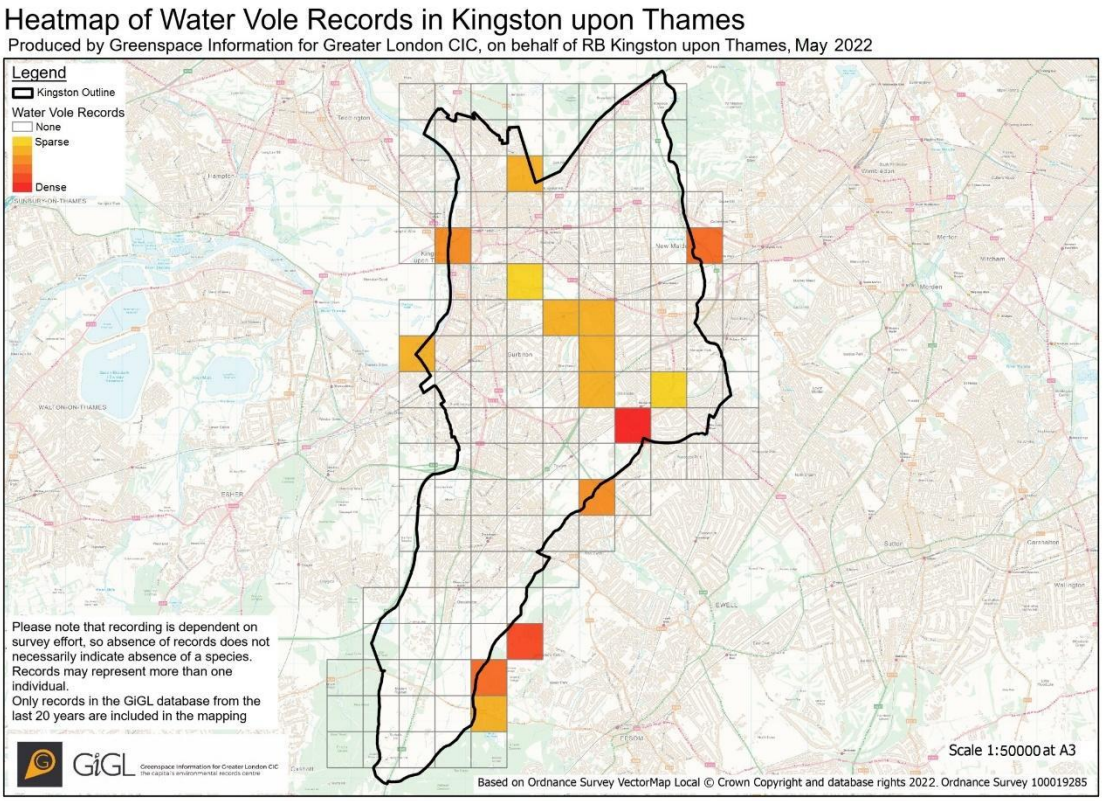

Figure 1 Distribution of the water vole across RBK over the last 20 years.

4 Key Habitats

Water voles live along rivers and streams, standing open water, wetland habitats and even ditches that have slow flowing water. They prefer soft and undisturbed earth banks which can easily be burrowed into, surrounded by dense native vegetation. Ideal sites are those with wide, clay banks with a range of vegetation, from grasses to herbs, sedges, rushes and reedbeds. They also feed on the bark and roots of trees, as well as bulbs and rhizomes during the winter months. However, areas that are too densely shaded, that are frequently trampled or are heavily grazed will be avoided.

Water voles have a relatively long breeding season with up to 5 litters produced per year and 5-8 pups in each litter. During this time, the males eat around 80% of their body weight every day to maintain their condition while breeding females may require double that amount. It is therefore vital that there is 2-5 metres of bankside vegetation available for food and cover from predators between the months of March and September, along with up to 300m of territory along a bank. This means that managers need to avoid cutting vegetation to ground level during these months as leaving bare gaps in vegetation robs this species of vital resources.

In the following spring, young adults move out and into new banks close to their original colony. Therefore, for populations to expand, there must be more suitable and accessible habitat nearby to support them. If a plentiful food supply is available, then water vole populations will quickly expand. Once established, they tend to manage the environment themselves while also increasing biodiversity. By managing habitats for water voles, a number of non-target species such as bats, otters and insects are likely to benefit.

5 Ecosystem Functionality and Services (Role in the Climate Emergency)

5.1 Trophic Position

Water voles are close to the bottom of the food chain and provide a source of food for many predators which helps to support the trophic cascade. As herbivores, they also play an important role in maintaining healthy ecosystems by preventing the overgrowth of vegetation. Furthermore, their role in seed dispersal supports plants that are important for the survival of other animals in the landscape.

5.2 Habitat Creation

Water voles positively impact their environment by creating and maintaining their habitats. By creating burrow networks, water voles dry the surrounding soil which promotes microbial activity. This, in turn, regulates the availability of nutrients to plants by increasing the conversion of ammonium into nitrates and other inorganic compounds. In this way, water voles gradually fertilise plants near to the root system and over time, plant species that were once rare become more common and the landscape more diverse (Bryce, 2006; Bryce *et al.,* 2013).

Water vole foraging activity also increases the range of grasses and wildflowers on site for bees, moths and butterflies, which then become a food source for birds, bats, swifts and other important predators. In addition, their complex underground

burrows provide refuge for various reptiles, amphibians and insects. Overall, this means that water voles are an incredibly valuable but endangered keystone species, whose populations have a disproportionately large impact on nutrient production and biodiversity along our waterways.

5.3 Climate Change Mitigation

By increasing biodiversity and maintaining healthy ecosystems, water voles help to build resilience in their habitats which is important for mitigating the impacts of climate change and global biodiversity loss.

6 Threats to Species

Habitat Loss & Fragmentation

Development and the urbanisation of floodplains have led to the direct loss of water vole habitat and riparian vegetation. As the availability of suitable habitat declines, water voles become vulnerable to fragmentation, limited genetic diversity and local extinction.

Water voles have recently been reintroduced to Kingston upon Thames, by a project coordinated by Citizen Zoo. As part of this initiative, several habitat improvement projects have already taken place to increase the quality of the reintroduction zone, such as tree works to increase light availability and create grassy areas in the catchment, invasive species removal and subsequent planting of native species, litter picking and American mink monitoring. A series of dead hedges have also been implemented to protect areas of bankside habitat to establish core areas of habitat for water vole.

Predation by American Mink

American mink escaped and were actively released into the UK as a result of fur trade in the 1970's. Predation by American mink in conjunction with habitat loss and extreme weather has led to a crash in water vole populations, making them the UK's fastest declining species. Mink territory can extend up to 2-3 km along the bank of a waterway which means they are particularly vulnerable to predation by American mink. Inevitably, the extinction of colonies can ensue within a matter of weeks (Aars *et al.,* 2001; Rushton *et al.*, 2000).

Mustelids (fur-bearing carnivores) are notoriously difficult to detect due to their high mobility. Fortunately, extensive monitoring by Citizen Zoo has detected only 1 American mink along the Hogsmill in 2022, as part of a control programme that has been active since 2019. This involves a series of 10 floating rafts deployed across the catchment. As part of this programme, the floating rafts with clay pads are deployed and checked for footprints at regular intervals by volunteers.

10 rafts remain in fixed locations across the catchment while checked for footprints of American mink. If suspicious prints are found, a camera trap is deployed to confirm the presence of mink and in the event of mink being confirmed, the clay rafts are swapped for a humane trap as part of Citizen Zoo's mink protocol. Any non-native species caught in these traps are then humanely dispatched.

Furthermore, there are a series of 'remoti'

rafts which are continuously deployed in locations surrounding the water vole release site. This approach has been successfully proven to remove and control mink in other areas across the UK most notably East Anglia.

Pollution
It is not known the extent to which pollution in urban areas has impacted water voles. However, research has shown that water quality is an important factor for Eurasian otters who directly compete with and displace American mink – an important predator of water voles (Bonesi, Strachan & Macdonald, 2006). Logically, pollution can also contribute to terrestrial habitat degradation which may diminish available habitat for water voles.

River Engineering
Free movement along rivers, streams, ditches and wetlands is essential for water voles who depend on lush bankside habitats. Culverts and other crossings which interrupt the riparian corridor can create barriers which prevent them from accessing feeding grounds and expanding their populations. Protecting, enhancing and expanding remaining sites, and designing river crossings which are sympathetic to wildlife, can help to reduce the risks that are associated with modern river engineering. South East Rivers Trust, have proactively worked to improve fish passage and general ecological connectivity along the Hogsmill, with the successful removal of a series of weirs.

Poisoning
As rodents, water voles are commonly mistaken for rats and can be targeted as a result. Using best practice guidelines, rat control can be carried out effectively and even benefit water voles, as brown rats who are common in urban areas have been known to predate pups (Dean e*t al.,* 2016).

Disturbance
Disturbance such as the poaching and trampling not only causes the loss of riparian vegetation but also makes riverbanks unsuitable for water voles. Inappropriate management of both the waterside vegetation and the channel itself can also lead to the loss of suitable habitat. Other disturbances which can degrade banks include heavy grazing by livestock, high footfall from the public and use of the waterway by dogs. Measures such as the implementation of dead hedges and dog walker engagement can be used to mitigate these impacts.

Citizen Zoo has launched a Dog Walker Engagement Strategy called ‘Wild Walking with Dogs’ to work alongside dog walkers to educate them about the issues and empower them to engage with other dog walkers to promote wildlife friendly dog walking practices.

Climate Change
Flooding, drought and extreme weather events are expected to increase with climate change, all of which pose a threat to water voles. Flooding events during the breeding season are particularly worrisome, as these can cause the loss of young pups who are unable to swim.

7 Conservation actions (Tabulated)

Action	Timeframe	Lead	Partners	Evidence base
WV01 - Identify sites which have the potential for habitat creation, enhancement or expansion and increase connectivity across these sites.	2023 - ongoing	Citizen Zoo	Hogsmill Catchment Partnership, RBK	Water Voles on Your Land - PTES Managing for Water Voles – Sussex Wildlife Trust
WV02 - Encourage landowner / manager involvement in water vole conservation via liaison with local conservation groups, distributing management advice and information on grant schemes.	2023 - 2028	Citizen Zoo	Hogsmill Catchment Partnership, RBK	See **WV01**
WV03 - Support efforts to reintroduce and monitor water voles in RBK, including public engagement.	2023 – ongoing	Citizen Zoo	Hogsmill Catchment Partnership , RBK	Reintroducing Water Voles to the Hogsmill - CZ Monitoring Water Vole Populations with Sniffer Dogs - GOV.UK
WV04 - Monitor and manage American mink populations along waterways in RBK.	2023 – ongoing	Citizen Zoo	Hogsmill Catchment Partnership, RBK	See **WV03** Mink Rafts - GWCT Operational Plan - WRE

				Best Practice Guidance – WRE Good Practice Guide – RAPID
WV05 - Implement dead hedging or fencing where appropriate to protect water vole habitat.	2023 – ongoing	RBK		See **WV01**
WV06 - For key areas, prepare and implement supplementary planning guidance and local spatial strategies to ensure the long-term safeguarding / management of populations.	2023 – ongoing	RBK		Advice for Making Planning Decisions - GOV.UK Water Vole Mitigation Handbook – The Mammal Society
WV07 – Contribute to local and national species monitoring programmes (e.g. GiGL, NWVMP).	2023 – ongoing	Citizen Zoo	RBK	Returning Water Voles to the Hogmsill - Citizen Zoo National Water Vole Monitoring Programme - PTES Greenspace Information for Greater London
Engagement & Awareness	**Timeframe**	**Lead**	**Partners**	**Evidence base**
WV08 - Develop water vole based environmental	2023 - 2028	Citizen Zoo	RBK	N/A

education initiatives & provide opportunities to see water vole habitat in the wild.				
WV09 - Engage with dog walkers around water vole conservation.	2023 – ongoing	RBK, Citizen Zoo		Fencing Out Man's Best Friend – watervole.org.uk Wild Walking with Dogs
WV10 – Develop campaign to raise awareness of and provide guidance on rat control and water vole conservation.	2023 - 2028	RBK		Rat Control & Water Vole Conservation – Wildlife Trust

8 Planning Context - Biodiversity Net Gain

As a priority species for the borough, water voles should be protected through the planning system and, where possible, habitat creation and enhancement for water voles is encouraged. Planning conditions should be applied which enhance connectivity between relevant habitats and prevent or mitigate their deterioration.

9 Monitoring

Metric	Process of Monitoring	Timeframe	Lead	Partners
WV01 – Database of sites identified for potential habitat enhancement	Annual account	2023 – 2028	RBK	

WV01, WV02, WV05, WV06 – Number of habitat enhancement projects supported / undertaken	Annual report	2023 – ongoing	RBK	CZ, ZSL
WV02, WV09, WV10 - Collation of materials used	Ad hoc, Annual account	2023 – 2028	RBK	
WV03 - Number of reintroductions supported	Annual report	2023 – ongoing	RBK	CZ, ZSL
WV02, WV04, WV06 - Number of monitoring programmes supported / undertaken	Annual report	2023 – ongoing	RBK	CZ, ZSL
WV06 – Record of supplementary planning guidance produced	Update as needed	2023 - 2028	RBK	
WV07 – Database and map of records	Annual report	2023 – ongoing	RBK	
WV08 - Collation of materials used, number of events and number of attendees	Annual account	2023 – 2028	RBK	

10 Other relevant HAPs/ SAPs

a. Grassland
b. Hedgerow
c. Rivers and Streams
d. Standing Open Water
e. Amphibians
f. Reptiles

11 References

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12 Abbreviations

CZ - Citizen Zoo
GiGL – Greenspace Information for Greater London
NWVMP – National Water Vole Monitoring Programme
PTES - Peoples Trust for Endangered Species
RBK – Royal Borough of Kingston Upon Thames
ZSL - Zoological Society of London

13 Contact information

Elliot Newton (Biodiversity Officer)
The Royal Borough of Kingston upon Thames

Guildhall 2
High Street
Kingston upon Thames
KT1 1EU

Email: elliot.newton@kingston.gov.uk