

A close-up photograph of a water vole standing on a mossy bank. The vole has brown, shaggy fur and is looking towards the camera. The background is filled with green foliage and small blue flowers.

# The Water Vole

THE STORY OF ONE OF BRITAIN'S MOST  
ENDANGERED MAMMALS

**CHRISTINE GREGORY**  
FOREWORD BY CHRIS PACKHAM

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Adult water vole on a bed of water crowfoot in July.

# Foreword

**'Plop'. What would life be like without that characteristic 'plop', that little cork-pulling wet pop, which, if we are lucky, we can still hear as we wend along a wilder stream? It tells us that we have been spotted or heard by a nibbling water vole which has just leapt into the water, submerged and swum to safety. Luckier still and you might see a brief silvery flash as it paddles away downstream and then bobs up on to a mat of weed to continue chewing.**

Round and brown, cricket ball-sized, with tiny ears and prominent, beady eyes, it looks cuddly and cute. But when you see its huge and sharp yellowy incisors, which can deal a decent bite, then you may want to reassess any anthropomorphism. Not that others haven't been tempted; Kenneth Grahame made the misnamed 'Ratty' a household name thanks to the water vole's role in *The Wind in the Willows*. No bad thing either because loving these creatures in any way possible may just be their salvation.

You see poor old 'Voley', and 'Mrs Voley' of course, are in big trouble. They have become the fastest declining mammal in the UK. Only the hedgehog is giving them a run for their money in the extinction race. And who would have thought it? They were once so common, but since canalisation of our waterways, pollution, abstraction and the unfortunate introduction of the American mink those 'plops' have become a sound of yesteryear. It's not all doom though as we understand the problems and have solutions in the form of habitat creation and reintroductions and in some places water voles are making a comeback.

This book provides pretty much all you need to know about these charming creatures: a field guide to the species, an encyclopaedia of volery and a volume of vole stuff to inform and interest all. Superb!

**Chris Packham**  
2015



Adult water vole at a burrow entrance eating water crowfoot stems.

AS HE SAT ON THE GRASS AND LOOKED ACROSS THE RIVER,  
A DARK HOLE IN THE BANK OPPOSITE, JUST ABOVE THE WATER'S EDGE, CAUGHT HIS EYE,  
AND DREAMILY HE FELL TO CONSIDERING WHAT A NICE SNUG DWELLING-PLACE IT WOULD MAKE  
FOR AN ANIMAL WITH FEW WANTS AND FOND OF A BIJOU RIVERSIDE RESIDENCE,  
ABOVE FLOOD LEVEL AND REMOTE FROM NOISE AND DUST.  
AS HE GAZED, SOMETHING BRIGHT AND SMALL SEEMED TO TWINKLE DOWN IN THE HEART OF IT,  
VANISHED, THEN TWINKLED ONCE MORE LIKE A TINY STAR.  
BUT IT COULD HARDLY BE A STAR IN SUCH AN UNLIKELY SITUATION;  
AND IT WAS TOO GLITTERING AND SMALL FOR A GLOW-WORM.  
THEN, AS HE LOOKED, IT WINKED AT HIM, AND SO DECLARED ITSELF TO BE AN EYE:  
AND A SMALL FACE BEGAN GRADUALLY TO GROW UP AROUND IT, LIKE A FRAME ROUND A PICTURE.

A BROWN LITTLE FACE WITH WHISKERS.

A GRAVE ROUND FACE, WITH THE SAME TWINKLE IN ITS EYE THAT HAD FIRST ATTRACTED HIS NOTICE.

SMALL NEAT EARS AND THICK SILKY HAIR.

IT WAS THE WATER RAT!

THE WIND IN THE WILLOWS, KENNETH GRAHAME (1908)

# Introduction

The water vole is Britain's fastest declining mammal. The Vincent Wildlife Trust conducted two national surveys, between 1989 and 1990, and 1996 and 1998, that first demonstrated the dramatic decline of this cherished species across Britain. Since then the number of sites once occupied by water voles has diminished even further, but they are doing well in many parts of Britain where conservation efforts have been focused. This book explores the fortunes past and present of the water vole, principally in Derbyshire, where just over a hundred years ago the great Victorian naturalist Jourdain described it as being 'found commonly in all our slow flowing streams'.

Over several years spent searching the rivers and canals of Derbyshire I have met many people who know and love their water voles; they can point to their burrows and places where they feed and they know when the voles have gone. I have also had numerous conversations about places where you 'can always see water voles', but when pressed I have found that 'always' is not this summer or even the last, and 'recently' may stretch back as far as five or even ten years. Today there is much talk of the 'new normal' where we have become used to scarcity and absence and any wildlife sighting is a cause for celebration and reassurance that all is well. In the spring and summer of 2014 I knew of several places where I was likely to see water voles; in 2015 I have struggled to find any at all.

Twenty-five years ago I moved to Youlgrave and lived with my family in a cottage perched high above Bradford Dale. Water voles were a common sight then, sitting close by the paths quietly munching their way through grasses or waterweeds they had dragged to their favoured haul-out platforms. Walks along the River Bradford were often punctuated with the distinctive plop sound of the water voles' watery vanishing trick. Around the mid 1990s the water voles vanished altogether and there were rumours of mink in the dale. In 2007, after a slow process of recolonising the river over previous years, the water voles were back and I spent many May mornings filming their antics on a camcorder amid the reeds at the southern end of the dale. On 25 June 2007, a summer deluge caused devastating floods and the deaths of two people in Sheffield. It also washed away this small colony of water voles. Four years later the river dried up completely and later flooded in 2012 in a pattern of extreme weather events experienced all over the country. Water voles have been seen sporadically on the Bradford since then but are currently scarce. Their fortunes on this little limestone river over the last quarter-century mirror a more general picture of a species under pressure from numerous threats.



Scientists are now in agreement that we face a biological crisis on Earth, so great that it is without precedent in the planet's history. In an article in *The Observer* on 21 June 2015, Jan Zalasiewicz, professor of palaeobiology at the University of Leicester, drew attention to new research indicating that the Earth is now on the brink of the 'sixth great mass extinction.'<sup>1</sup> The fifth was that which extinguished the dinosaurs. The current crisis is caused entirely by human activity. In a scientific paper published on 19 June 2015, Gerardo Ceballos of the National Autonomous University of Mexico and his colleagues judged that by the most conservative estimates the rate of vertebrate species extinctions since 1900 is between 10 and 100 times faster than long-term baseline rates (rates vary between different groups of animals with amphibians the fastest declining). The baseline or background rates are determined before 'the period during which *Homo sapiens* truly became a major force on the biosphere'. Since 1900, across all vertebrate

groups, nine extinctions would be the baseline figure of naturally occurring extinctions. But in that time 468 species no longer exist, 69 of which are mammals. In his shocking article Zalasiewicz also draws attention to the sheer bulk of humanity as measured by scientist Vaclav Smil, of the University of Manitoba. Smil has calculated that humans now make up a third of land vertebrates in terms of mass and the animals that we keep to eat make up most of the other two thirds. All of the world's wild animals constitute just five per cent of land vertebrate biomass on earth. Humans have pushed wild animals to the brink. The water vole is close to extinction in Britain although it is not on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species as it is still common elsewhere. But the story of the water vole's demise, long before the arrival of American mink, reflects the global picture of the replacement of wild animals with those kept to feed humans.

The immense wealth of scholarship and detailed research dedicated to the cause of the water vole leaves no room for doubt as to how we can best save it, but despite many public policy statements on protecting biodiversity, wildlife comes low on the government's agenda in austerity Britain. As Chris Packham says in the foreword to this book, love may just be the thing that saves the water vole – that and public pressure.

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1) Zalasiewicz, 'The Earth stands on the brink of its sixth mass extinction and the fault is ours', *The Observer* (21 June 2015) [online] <<http://www.theguardian.com/environment/2015/jun/21/mass-extinction-science-warning>>

**The first two parts of this book are focused on water voles, on what they are and how they live, with suggestions on how to find them. Part 3 summarises their legal status as a highly protected species. Part 4 provides a brief historical account of the water vole in Derbyshire, a guide to the principal rivers, their catchments and associated canals, and an outline of what is currently known of the water vole's presence across the county.**

At the close of Part 4 there are sections outlining some of the principal threats to water vole survival in the remaining places where they can be found in Derbyshire. Part 5 has an account of the evolution of the water vole from fossil records of its earliest ancestors through to its accelerating decline. It explores some of the impacts that humans have had on this island from the first farmers through to the present day. There is also an account of water voles that do not live anywhere near water and which were once common and widespread in Britain. Changing land use is a constant theme in both parts 4 and 5, whereas Part 6 takes us to the most recent chapter in the decline of the water vole and the interlinked fortunes of three species of mammals, the otter, the mink and the water vole. The final part of the book looks to the future of the water vole with a consideration of the negative impacts of alien species, climate change and damaged ecosystems as well as the recovery of our rivers and the positive success stories of water vole reintroductions, habitat restoration and conservation.

I have had the privilege of meeting many inspiring people in the making of this book and seen many examples of the healing powers of nature. The sculpted slag heaps of north-east Derbyshire, where the hills once glowed red in the night from the volatile substances stacked high within them, are now cloaked with some of the finest and most extensive species-rich meadows in the county. Once raw, scarred, crumbling cliffs of eroded earth have been transformed into flower-decked banks on the River Derwent.

There is now an extremely high level of understanding of the optimum conditions needed for water voles to survive and even to thrive. There is much cause for hope here. Decades of dedicated research, analysis and an understanding of the causes of the decline and the precise requirements for the recovery of this species now aid recovery programmes. The effort and goodwill of thousands of volunteers who have put in many hours on species monitoring are aiding research and restoring habitats. The visionary work of conservationists has healed and restored some of the most blighted landscapes in Britain, and nature itself reclaims spaces and flourishes once the pressure is off. Many fishing clubs and estates who know the most about the complex web of life sustained by our rivers have seen beyond the private joys of fly fishing to the greater project of rebuilding the health of Derbyshire's glorious rivers and engaging local communities with their ideas.

We can all become part of the water vole's future. There is a list of organisations at the back of this book you can contact if you want to be involved in monitoring, reporting or habitat restoration work. The People's Trust for Endangered Species has launched a new national survey in which members of the public are invited to take part. So go out, start looking and get your children and grandchildren involved. Join your local Wildlife Trust and experience the joy of sharing the world with an animal common in Britain long before humans were part of the story.

**Christine Gregory**

October, 2015

'Avoiding a true sixth mass extinction will require rapid, greatly intensified efforts to conserve already threatened species and to alleviate pressures on their populations – notably habitat loss, over-exploitation for economic gain and climate change ... but that window of opportunity is rapidly closing.'<sup>2</sup>

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2) Ceballos, Ehrlich, Barnosky, Garcia, Pringle and Palmer, 'Accelerated modern human-induced species losses: Entering the sixth mass extinction' in *Science Advances*, Vol.1, No.5 (19 June 2015).



# part 1

The Water Vole

# What is a water vole?

*Water rat, water ratten, water mole, crabber, waterdog, earth bound, water campagnol.*

The water vole (*Arvicola amphibius*) is a medium-sized rodent native to Britain.<sup>1</sup> It is in a group of animals called Cricetidae, which includes voles, lemmings and hamsters. The Cricetidae family is large but in Britain there are just four species, all of which are voles. Mainland Britain is home to the bank vole (*Myodes glareolus*), the field vole (*Microtus agrestis*) and the water vole (*Arvicola amphibius*). There is also an island population of voles that are similar to the field vole but considerably larger – the Orkney vole.

The water vole is by far the largest of the British voles and is similar in size to the common rat (*Rattus norvegicus*). *Arvicola amphibius* is one of three types of water vole that inhabit the northern hemisphere across Europe, Asia, North Africa and parts of the Asian Peninsula. *Arvicola sapidus* occurs only in France and the Iberian Peninsula, *Arvicola scherman* is present in France and Germany while our water vole, *Arvicola amphibius*, is widespread and can be found from Western Europe to eastern Siberia.<sup>2</sup>

The defining characteristics of the water vole are its large size relative to other voles, its rounded appearance, small ears, and a tail that is longer than that of other voles. It has open-rooted teeth that continue to grow throughout its life while being worn down by grinding on fibrous or hard plant material.

The water vole is widespread throughout mainland Britain and is present on both the Isle of Wight and Anglesey but it does not occur on most of the offshore islands or Ireland.

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1) Linnaeus developed a system of naming and classifying species in the 18th century that we still use today (taxonomy). He named both *Mus terrestris* and *Mus amphibious* in 1758. '*Arvicola*' was first used to name the genus for all water voles in the 1790s. The scientific community has alternated between '*terrestris*' and '*amphibius*' or '*terrestris amphibius*' in recent years. Now '*amphibius*' is adopted as the correct name and will be used in this book. The historic names given are listed in Harris and Yalden, eds., *Mammals of the British Isles*, (2008). 2) Ibid.



Water vole eating an ash leaf; its lengthy tail (around two-thirds body length) is clearly visible.

## IDENTIFYING THE WATER VOLE

There are really no other species similar to the water vole other than the common rat (*Rattus norvegicus*) although I have been put on the trail of a water vole by teenagers from London who had spotted a 'beaver' on the River Bradford near Youlgrave. On another occasion a family had seen a water vole with a very long nose by Linacre Reservoir near Chesterfield that turned out to be a (much smaller) water shrew.

A baby water vole could be mistaken for a bank vole or (the heavier) field vole, but the long tail, larger head and hind feet make identification clear.



Water vole pup, soon after its first forays out of the burrow, is similar in size to an adult field vole.





Adult bank vole, with smaller head and feet, short tail and more prominent ears than the baby water vole.