National Water Vole Database and Mapping Project

PART 1: PROJECT REPORT for period 2009 – 2018

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Protecting wildlife for the future

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INTRODUCTION

The National Water Vole Database and Mapping Project (NWVDMP) is the only project of its kind in the UK. It brings together and maps water vole and mink data, and therefore can inform conservation efforts for water voles. Information about the project, including an interactive map, is held here: <u>https://www.wildlifetrusts.org/national-water-vole-database-mapping-project</u>.

The NWVDMP began in 2008, following revisions to the Biodiversity Action Plan (BAP) targets for water voles which sought to create a shared vision for conservation across the devolved nations. The targets were: firstly, to maintain the range of water voles, (730 occupied 10km grid squares, according to data available at the time), and secondly, to increase the range by 105 additional occupied 10km grid squares by 2015.

A standardised method for storing and managing water vole and American mink data was devised, including setting out which data would be necessary to identify trends in distribution, and providing a standard method for analysing and mapping this data.

The project has two primary aims:

- 1. To assess the national status and trends of water vole distribution, and,
- 2. To use a geographic information system, or GIS, to enable strategic water vole conservation at the local, regional and national level.

Previous reports tracked progress up to and beyond the 2015 target date, with the data available at the time suggesting that in the 10 years to 2015, there was a 30% decline in the places that these river mammals once lived across England and Wales.

2009-2018 Report

This report presents the latest annual update to the project, building on the detailed report to December 2017 which had sought to update our understanding of progress against the UK BAP targets. This report covers data for the 10-year period from January 2009 through to December 2018. In recent annual updates we have obtained substantial data pertaining to England and Wales, with more limited data relating to Scotland. For this report, with funding from NatureScot we have been able to complete a full update to the Scottish data and maps.

This report therefore provides the first complete update to the water vole alert areas for the whole of Great Britain since 2008.

Funding to update the distribution and alert maps and create this report was provided by The Wildlife Trusts and NatureScot.

METHODOLOGY

Data Collation and Formatting

Each year, data requests for water vole and mink presence and absence data are made to Local Environmental Records Centres (LERCs), PTES, individual Wildlife Trusts and other suppliers. This year, data was sourced from suppliers in Scotland, England and Wales. The data is quality checked, cleaned, and formatted in Excel, ready for import and analysis in GIS.

Key Area Data Analysis and Mapping

The data is used to generate three tiers of map which are explained in Fig. 1.





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The aim of the alert and key areas maps is to identify the areas known to support water vole populations and areas where some of the more robust populations may be found. Data covering a 10-year period is analysed in order to avoid the skew caused by differences in availability of data each year and to ensure alert areas are not lost due to changes in surveying capacity over time.

The methodology for producing the alert and key areas mapping is based on work undertaken originally by the Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust, which is summarised in the second edition of the Water Vole Conservation Handbook (Strachan and Moorhouse, 2006). Mapping is produced by buffering water vole records to capture some of the potential surrounding habitat and areas within average water vole dispersal distance. A figure of 0.5km (measured from occupied watercourses) has been used to capture some of the surrounding habitat and a figure of 2km, as measured up- or downstream from water vole records, has been used to capture dispersal distance.

The three tiers of mapping (alert, local and regional key areas, Fig. 1) have been produced for the 10 English River Basin Districts, for Wales, and for Scotland (12 sets of maps in total). A further map shows the Regional Key Areas across the UK and, in the previous report, an additional set of maps was introduced in response to feedback from users, displaying current alert areas alongside alert areas based on historic data in order to show areas previously favourable for water vole. In this update, a new map has been introduced to show changes in RKAs since the previous report (see <u>NEW MAPPING</u> section). A final map indicates the broad locations of water vole reintroduction projects. The full suite of maps is available in Part 2 of the report.

The methodology used to derive the alert maps is explained further in the 2017 project report published by Hampshire & the Isle of Wight Wildlife Trust and The Wildlife Trusts (McGuire & Whitfield, 2017):

https://www.wildlifetrusts.org/sites/default/files/2018-05/water_vole_report_2006-2015_final.pdf

Limitations

Data accuracy

Data received for this project has been through a process of verification resulting in a good quality dataset. It is further cleaned and formatted and only those records with a minimum 6 figure grid reference are included in the analysis. However, there may still be errors in the original data such as transposed numbers placing records in a different, incorrect location. Spot checks are carried out but due to the volume of records in the database it is not possible to check each one for accuracy.

Recorder effort

Recorder effort is an important factor to consider when comparing distribution over time; and budgets for conducting water vole surveys have reduced over recent years. However, by comparing averages between five-year periods, the impact of variations in effort over time are reduced. Variations in spatial recorder effort are further reduced by analysing distribution by 10km grid squares.

Population versus distribution

It is important to note that the outputs do not show population sizes, but rather the distribution of the species. Users of the maps should also be aware that one record in a square turns it positive, i.e., a record from even a single 1 hectare site within the grid square would create the same output on the distribution map as records from multiple (or even all) 1 hectare sites within that 10km grid square.

Areas of known water vole absence

In some parts of the UK it is known that water voles are functionally extinct. Due to the 10year coverage in this report, some of these locations will feature alert areas despite only absences being recorded within these areas in recent years. This means that very recent localised distribution changes will not be shown. However, the fact that these areas have, within the last 10 years, supported water vole populations to a greater or lesser extent suggests there is potential for re-establishment of water vole populations, given appropriate management. It is hoped that the alert areas will continue to inform these conservation efforts such that robust water vole populations may be restored in the future.

Project scope

The updated distribution and alert maps cover Scotland, England and Wales.

RESULTS

Distribution

Key findings

- After a period of apparent growth in distribution of water voles, this appears to have stalled in recent years, with average annual occupancy remaining between 828 and 849 occupied squares since 2015.
- Based on the data now available, the overall decline in water vole distribution across Great Britain between January 2006 and December 2018 is currently estimated at 23%.
- Since the last report, 10 new RKAs have been identified but 6 long-term RKAs have been lost.

The 2006 UK Biodiversity Action Plan set two key targets for water vole distribution, based on the data available at the time:

- Target 1: Maintain the current range (730 occupied 10km squares) of water vole in UK.
- Target 2: Achieve an increase in range by 50 new occupied 10km squares in the UK by 2010. Achieve a further increase in range by 55 new occupied 10km squares by 2015.

The NWVDMP has continued to assess the distribution of water voles against these targets since 2008. Data has been analysed in five-year blocks to avoid the skew caused by fluctuations in recording effort. The overall pattern of distribution since 2006 of decline followed by slow growth and levelling off remains unchanged. However, whilst distribution has not dropped below the original baseline *target* of 730 occupied 10km squares, it is substantially lower than the *actual* baseline of 1,078 occupied 10km squares, based on the data that is available now (Fig. 2).

As more historic data is incorporated into the national database our understanding of the distribution of water vole is enhanced. Whilst the original 2006 targets represented positive goals based on the available data, they have lost relevance because the baseline and goals would have been set much higher, had more data been presented. Consequently, whilst considerable effort has been made to reverse the decline in water vole distribution, it must be recognised that distribution has nonetheless fallen, and remains, significantly below the 2006 distribution. Furthermore, this decline is set against the context of an earlier extrapolated 94%

decline in distribution between 1900 and 1998. (Strachan et al, 2011). Since 2015, expansion of distribution appears to have stalled.





Change in Regional Key Areas

The RKAs have been compared between the last report, covering the period 2008-17, and this report, covering the period 2009-18. The results have been mapped (<u>NEW MAPPING</u>) and are available in Part 2 of this report. A summary of the findings is presented in <u>Table 1</u>, below.

Status	Number of RKAs affected	Average area of change (sqkm)
New	10	54.32
Increased in area	17	16.61
No change / less than 1sqkm change +/-	13	0.15
Decreased in area	32	114.31
Area decreased to below RKA threshold / RKA lost	6	47.43

Table 1: Summary of changes in Regional Key Areas between 2008-2017 and 2009-2018 reports

Ten new RKAs have been identified, three of which are in England with the remaining seven located in Scotland. It is possible that the seven new Scottish RKAs have been present for some time, as a Scottish data update has not been carried out until now. The new RKAs in England represent the growth of existing alert and/or LKAs to the extent that they now meet the criteria for RKA. For example, the new RKA in Northumberland is confirmed as due to

extensive work to control American mink, restore habitats and reintroduce water voles under the *Restoring Ratty* project. For further details, see: <u>THE MAPS IN ACTION</u>.

A further 17 existing RKAs have increased in area, with an average expansion of just under 17sqkm, with 13 RKAs remaining fairly stable.

Of concern, is the decrease in area of 32 RKAs. Whilst remaining above the threshold for RKA status, in most cases RKAs have seen an overall contraction from the extremities. Of particular concern are those RKAs where the decrease in area has split previously large, single RKAs into two smaller RKAs. This increases the risk of smaller, increasingly isolated populations which could become less viable in the long-term.

The remaining six RKAs that were present at the time of the last analysis have decreased in area below the 35sqkm threshold for RKA status, either through contraction or the loss of connecting alert area (Table 2).

RKA Location	Change
Lune Forest, County Durham	Contraction in area to LKA status (less than 35sqkm)
Llyn Peninsular, Gwynedd	Loss of connecting alert area resulting in two LKAs and one alert
	area fragment
Betws-y-Coed, Conwy	Loss of connecting alert area resulting in one LKA and three alert
	area fragments
Whitchurch, Shropshire	Contraction in area to LKA status (less than 35sqkm)
Nr Scuntunthorpe, Lincolnshire	Contraction in area to LKA status (less than 35sqkm)
/North Lincolnshire	
Between Maldon and	Loss of connecting alert area resulting in two LKAs
Chelmsford, Essex	

Table 2: Assessment of changes resulting in loss of RKA status

Further work is critical to establish which of the changes are due to survey effort and which may be due to a genuine decline in water vole populations, particularly as RKAs represent some of the best habitat available to support water voles in the long-term.

Revising the BAP targets

The original targets for maintaining a baseline and increasing distribution of water voles were based on the data available at the time, which comprised 36,898 water vole presence records (<u>Table 3</u>). Since then, over 23,000 additional records dated to the end of 2009 have been submitted to the project. Consequently, the original targets can no longer be considered appropriate due to greater understanding of past distribution. On the basis of data currently available, assessment of whether baseline occupancy has been maintained should be

undertaken against a revised target of 1,078 occupied 10km squares, which is now understood to be the occupancy at the time the BAP targets were set, according to the data now available. Using the same targets for increase as originally proposed, this would set an initial target of increasing distribution to 1,128 occupied 10km squares, and a subsequent target of 1,183 occupied 10km squares. This analysis will be formally presented to the UK Water Vole Steering Group with a recommendation that the new understanding be used to set future targets e.g. for 2025 and 2030 (see <u>CONCLUSION</u>).

Extent of Dataset

<u>Table 3</u> shows the cumulative number of presence and absence records for water vole and mink held in the database, since publication of the first report in 2009. The figures in each column represent the total number of *records held* in the database up to the end of the year stated in that column. The total number of positive water vole records held to date is 101,049.

It is important to note that the figures in the table represent the cumulative data held in the database for both presence and absence records used to analyse the spatial distribution of water voles, and do not suggest an increase in population size of either species.

Year	Water vole presence	Water vole absence	American mink presence	American mink absence
2009	36,898	10,288	7,883	4,213
2010	42,006	10,463	8,582	4,213
2011	50,717	11,734	9,146	5,136
2012	62,080	12,512	12,730	5,282
2013	67,161	12,661	15,460	5,451
2014	71,922	12,913	16,109	5,645
2015	75,063	13,541	16,377	5,790
2016/17	94,474	16,089	18,456	6,637
2018	101,049	16,516	19,459	6,782

Table 3: Total cumulative number of records held in the national database by year

Some of the datasets collated by the project are extensive and include records dating back to the 19th Century. The earliest water vole and American mink records are dated 1861 and 1952 respectively. The majority of data, however, are from the mid-1990s to the present day. As refinements are made to databases held by Local Environmental Records Centres and additional past records are validated and digitised or removed due to ambiguity, revised datasets are occasionally supplied to replace some existing records in the project database.

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Records by data supplier

Data for the current update was received from 42 different data suppliers across England Scotland and Wales with historic records included from 41 further data suppliers. The full list of current and historic data suppliers is included in Appendix 1.

THE MAPS IN ACTION

Restoring Ratty – Bringing the water vole back to Kielder by Graham Holyoak, Northumberland Wildlife Trust

Kielder Forest in Northumberland once had a thriving water vole population but, as in so many places, habitat loss and American mink had wiped out the population. The situation started improving in the 1980s as the replanted forest blocks were planted away from the water courses creating the start of a network of good quality riparian water vole habitats. The Forestry Commission wildlife rangers also managed to get on top of mink populations and created an environment suitable for the reintroduction of water voles.

Northumberland Wildlife Trust, Forestry England and Tyne Rivers Trust have been working together for the last seven years, with funding from the National Lottery Heritage Fund, to bring water voles back to Kielder. The first two years comprised ensuring that the area was mink free and there was a public will to have these iconic native mammals back. The last four years have seen eight water vole releases totalling 1,762 voles released Fig. 3. These voles have been captive bred from wild caught voles from populations in the North Pennines and Scotland. This has been combined with an engagement and education programme with over 1,000 pupils working on the project.





Fig. 3: Preparing to release water voles at Kielder Forest as part of the Restoring Ratty project

Image credits: Northumberland Wildlife Trust

The National Water Vole Database & Mapping Project has allowed us to look further afield as we look at the next stage of the project and our goal of connecting the new Kielder population with its donor population in the North Pennines. We will be looking at the next steps which will include further mink control and working with local landowners on water vole habitat – followed by more reintroductions on the tributaries of the North Tyne . <u>Naturally Native</u>, a recently funded mink control and habitat improvement project across the river catchments of the Tees, Wear and Tyne, will help us towards this goal. *Naturally Native* is a partnership project between Durham Wildlife Trust, Northumberland Wildlife Trust and Tees Valley Wildlife Trust again funded through the National Lottery Heritage Fund.



Fig. 4: Water vole are now thriving in Kielder Forest thanks to the Restoring Ratty project. Image credit: Northumberland Wildlife Trust.

Essex Mink Control Programme — strategic water vole conservation in action

by Darren Tansley, Essex Wildlife Trust

By 2006, water vole Arvicola amphibius had been reduced to 17% of their historic range in Essex following the expansion of predatory mink Neovison vison first recorded in the county in 1962 (Dobson & Tansley, 2014). Mink control efforts were already underway in Suffolk and Norfolk, the other two coastal counties of East Anglia. Initially, a Water for Wildlife Project Officer was employed at Essex Wildlife Trust on a three-year contract with Water Vole Recovery as one of the key objectives. Anglian Water, The Environment Agency and Essex and Suffolk Water continued to fund the project after the initial period and Essex Wildlife Trust hosted the role.

The strongholds for water voles in 2007 were along coastal grazing marshes so a 350km² area of the Tendring Peninsula was selected as a pilot for mink removal. During the subsequent 10 years the project was expanded inland along the River Colne, close to the Suffolk border then south through the county, catchment by catchment. The budget of £5000 per year from Water for Wildlife was used to provide free training and equipment to landowners, land managers and volunteers who delivered the mink control under coordination by Essex Wildlife Trust (Fig. 5). Within three years, water voles began to expand their range and by 2014 had recovered to 25% occupancy (Fig. 6).





Fig. 5: Mink control in Essex: Left: Using ecorafts with wrapped edges to prevent microplastic pollution from shedding polystyrene Right: Still from webcam showing mink on ecoraft Image credits: Darren Tansley/Essex Wildlife Trust



Fig. 6: Water vole have expanded their range in Essex where mink have been eradicated. Photo credit: Russell Savory/Essex Wildlife Trust.

Mink capture and water vole data have been collected throughout and supplied to the National Water Vole Database & Mapping Project (NWVDMP) to inform the regional distribution maps. However, volunteer led mink control is difficult to maintain at a constant level and project fatigue or complacency after initial successes can result in gaps in the network and the return of mink. So, in 2019 a new regional group, Waterlife Recovery East¹, was constituted to bring together relevant stakeholders across nine counties of the Eastern Region. The aim was to fund a landscape scale mink eradication pilot across 5000km² of Suffolk and Norfolk, surrounded by an 80km mink control buffer including the whole of Essex (Fig. 7). In 2020 this moved from the planning to the funding phase.

The results of the ten-year review by the NWVDMP have been a key part of informing this regional pilot, attracting funding and identifying the necessity to move from open-ended, potentially patchy mink control, to properly funded eradication. The NWVDMP will provide the ideal opportunity to compare the eradication zone with similar areas where mink control is absent or small scale and assess the impact for water vole conservation.



Fig. 7: Eastern Region mink control zones. Image credit: Essex Wildlife Trust.

Green: Pilot mink eradication zone; Orange and Red lines: 30km and 60km buffers, respectively.

¹ waterliferecoveryeast.org.uk

WATER VOLE CONSERVATION IN A POLICY CONTEXT

A common starting point

The NVWDMP considers water vole data for the whole of the UK excluding Northern Ireland, (since water vole are absent from the island of Ireland).

Due to the presence of the species in England, Wales and Scotland, the findings of the project are of relevance for conservation policy and delivery across the countries, and conservation efforts for water vole were previously driven at UK level (Joint Nature Conservation Committee 2019a,b). However, nature conservation is now a devolved issue, meaning that the policy and legislative drivers and the approaches taken in each country can differ. Whilst this offered the opportunity for nations to stride ahead with their conservation efforts, it also brought with it a risk that where approaches differed, they would not collectively amount to a coherent and strategic conservation approach. For water vole, the NWVDMP was established to lessen this risk.

In order to understand the opportunities via which the outputs of this work can be utilised, it is necessary to consider the frameworks that now exist across England, Scotland and Wales. Where they differ, country-specific opportunities may arise for water vole conservation, whilst the commonalities in the countries' approaches may also point towards common uses for the NWVDMP's outputs. This report considers the policy context for England. That for Scotland and Wales will feature in the next project report.

England

In England, statutory lists of priority species and habitats have been drawn up as required under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (England). Whilst similar approaches apply in the other devolved nations, is it then the onward evolution of the legislation that creates a variety of differing policy or legislative drivers for water vole conservation.

The NERC Act places upon public authorities in England a **duty to conserve biodiversity**, requiring local authorities and government departments to have regard to the purposes of conserving biodiversity in a manner consistent with the exercise of their normal functions; for example, in policy formation and decision-making.

In England, the forthcoming **Environment Bill** contains clauses which will strengthen the requirements of the NERC Act, requiring public authorities not just to conserve biodiversity, but to "conserve and enhance". This creates a driver to consider the reintroduction of water vole, and to support mink trapping projects as a precursor to this.

Furthermore, the Bill contains a clause that strengthens requirements around **Biodiversity Net Gain** which exist under the National Planning Policy Framework. The framework encourages developers to bring forward schemes that provide an overall increase in natural habitat and ecological features, minimising losses of biodiversity and helping to restore ecological networks. The Environment Bill will require that for the majority of planning permissions in England, a biodiversity gain plan will need to be submitted and approved before development can lawfully commence, and that gains of 10% should be delivered (calculated using an agreed metric). The gains will ideally be delivered on / near the site being developed but there may also be scope to 'pool' contributions to support the delivery of larger strategic schemes. This could encourage developers to support water vole recovery projects as a means of demonstrating their contributions to biodiversity gain.

The Environment Bill also contains requirements that will help achieve the commitment for a **Nature Recovery Network** in England, set out in Government's 25 Year Environment Plan. Local Nature Recovery Strategies will be developed under the Bill, which will set out a plan for how to achieve nature's recovery locally. Activity will be spatially targeted via Nature Recovery Network maps which collectively form a strategically-planned Nature Recovery Network designed to guide efforts to bring about nature's recovery on a national scale. These local strategies and maps should form a framework which can be used to target the activities described above, and direct funding to support them, (such as developer funding for delivery of Biodiversity Net Gain), as well as being used to target other activity or funding for biodiversity, for example through the forthcoming Environmental Land Management Scheme. The opportunities to deliver strategic water vole conservation work within the NRN framework are therefore substantial.

NEW MAPPING

Monitoring change in Regional Key Areas

The RKAs have been compared between the last report, covering the period 2008-17, and this report, covering the period 2009-18. The results have been mapped and are available in Part 2 of this report, and the findings are discussed in more detail in the <u>Change in Regional</u> <u>Key Areas</u> section. An extract of the new map is provided below in (Fig. 8).

This map can be used to demonstrate conservation success stories by illustrating those RKAs which have grown or are new. Importantly, it can also be used to identify areas of concern, where available data suggests a decline, and for which targeted survey work will help establish whether these regionally important populations are still present.



 New RKA
 Area increased
 No change or +/- <1sqkm change</td>

 Area decreased
 Area decreased to below RKA threshold
 River Basin District

Fig. 8: Extract from the new map showing change in Regional Key Areas

SUGGESTED USES OF THE MAPS

The maps from the National Water Vole Database & Mapping Project could be used in numerous ways to further water vole conservation. The following list highlights some potential uses:

• Habitat connection and expansion:

- Use maps showing local and regional key areas within your area of influence/interest to identify opportunities to expand key areas, or to connect smaller local key areas to create a larger regional key area.
- Identify opportunities for partnership working between neighbouring landowners, local authorities and conservation organisations by looking at where local and regional key areas cross administrative boundaries.
- In England, feed LKA and RKA maps into Local Nature Recovery Strategies to indicate where funding for conservation efforts locally should be directed.

• Focus survey effort:

- Use historic alert areas to target survey effort to gather more up-to-date information on the status of water voles in those areas.
- Plan investigations into whether there is scope for reintroduction (if the habitat is still favourable), whether mink control is required or whether habitat restoration work is required in areas where water voles are no longer present.

• Evidence for funding:

- Include the maps as supporting evidence in funding bids for targeted conservation work.
- Use local and regional key area maps to inform the development of agri environment scheme applications, and in England, to inform the targeting of ELM funding (e.g. through Local Nature Recovery Strategies).
- Site protection: Present local key area maps as evidence to inform the designation of statutory and non-statutory sites.
- Existing population protection: Share alert maps with organisations that undertake regular maintenance tasks, and so need to be aware of the potential presence of water voles. In England this could contribute to the 'Biodiversity Duty' of Public Authorities

CONCLUSION

The changing picture of water vole presence provided by the NWVDMP over time highlights the importance of data collection, collation, analysis and dissemination in informing both our understanding of water vole conservation status and in underpinning conservation efforts. As additional data have been added to the database we have learnt that the 2006 BAP targets, if taken at face value, have been 'achieved' – but in reality, the data tells us that the 'baseline' and 'increase' targets were set too low, and despite conservation efforts we have continued largely to witness the contraction of water vole distribution compared to actual 2006 occupancy. Populations continue to be lost from historically-occupied areas, with a 23% contraction in range in the 13 years since January 2006, on top of a severe decline in the preceding decades, when voles are estimated to have been lost from 94% of sites at which they were previously present.

Yet there is cause for optimism. This database now holds over 100,000 records of water vole presence, indicating a public and professional passion for this rapidly-declining mammal. Conservation success stories like the reintroductions at Kielder highlight that a strategic and collaborative approach can turn the fortunes of 'ratty' around. And an evolving policy arena and growing public awareness of the importance of making space for nature create opportunities to put strategic water vole conservation into action.

If we are to see the recovery of water vole across the UK, we propose that:

- Further water vole conservation targets should be established by the UK Water Vole Steering Group to reflect this new data, and to drive water vole conservation efforts as part of nature's recovery. These should build on the original targets, updated here to reflect our improved understanding of baseline (2006) occupancy:
 - Maintain 2006 occupancy of 1,078 occupied 10km squares (not achieved);
 - Expand occupancy to 1,128 occupied 10km squares by 2010 (not achieved);
 - Expand occupancy to 1,183 occupied 10km squares by 2015 (not achieved).
- Underpinned by new forward-looking targets, for example for 2025 and 2030, water vole conservation should feature strongly in **plans to reverse the decline of nature**, through:
 - Inclusion of all Regional and Local Key Areas in Local Nature Recovery maps across England. Local Nature Recovery Strategies should set out specific actions that can be taken to further the conservation of water voles in all LKAs and RKAs present in the area covered by the strategy, and should identify

areas to prioritise for the expansion or return of water vole, based on the NWVDMP's mapping;

- Use of the project's outputs by organisations when considering their legal obligations (e.g., the enhanced Biodiversity Duty that will be placed upon Public Authorities via England's Environment Bill) or strategic priorities (e.g., internal target-setting or project planning under the aspiration adopted by multiple Conservation Organisations of seeing '30% of land managed for nature's recovery by 2030'.
- Our updated understanding of water vole status should inform a revised view of what comprises 'Favourable Conservation Status' for the species. FCS is an articulation of what we aim to achieve in the UK to fulfil international and EU commitments for species and habitat conservation, and (re)defining what FCS 'looks like' for water vole will help to ensure that action can be prioritised where it will make the most significant contribution to the maintenance and recovery of water vole populations, in line with a revised view of what achieving FCS requires.

It is not beyond our abilities to both reverse the trend of decline and to restore water vole distribution, so that this characterful species may once again be a widespread and common sight throughout the UK. Acting upon the recommendations of this report could help to bring about not only the recovery of water vole, but also the restoration and re-creation of high-quality riparian habitats through sustained water vole conservation efforts. This will have manifold benefits, assisting in restoring populations of multiple species, restoring vital corridors for species migration, and delivering the wider ecosystem service benefits to society that a healthy, functioning river catchment can bring.

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Updating the project would not be possible without the time and dedication of the Local Environmental Records Centres, Wildlife Trusts, and other organisations who freely contribute their records to the project each year. Special thanks go to the many volunteers involved in surveying and collating data, as well as the countless members of the public who continue to send their water vole and mink sightings to LERCs, Wildlife Trusts, PTES and other dedicated water vole recording schemes. All play an integral part in the project by providing the evidence we need to assess the state of the British water vole population.

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All assessments and recommendations provided are based on the information available to Hampshire and Isle of Wight Wildlife Trust (HIWWT), and HIWWT endeavours to ensure all advice is accurate and appropriate at the time of publication. However, it is the sole responsibility of the recipient to ensure that any actions they take are both legally and contractually compliant, and HIWWT does not accept responsibility or liability for any losses incurred or arising from the advice we provide.

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National Water Vole Database and Mapping Project, Part 1: Project report for period 2009-2018

APPENDIX

Appendix 1:

List of Project Data Suppliers

Suppliers of water vole and / or mink data for England, Scotland and Wales, 2008 onwards.

Suppliers of water vole and American mink data from 2008 onwards		
ENGLAND		
Bedfordshire and Luton Biodiversity Recording and Monitoring Centre (Beds & Luton records)	Leicestershire & Rutland Wildlife Trust	
Bedfordshire, Cambridgeshire & Northamptonshire, Wildlife Trust for (Cambs records)	Leicestershire and Rutland Environmental Records Centre (LRERC)	
Berkshire, Buckinghamshire & Oxfordshire Wildlife Trust	Lincolnshire Environmental Records Centre (Greater Lincolnshire Nature Partnership)	
Bristol Regional Environmental Records Centre	Merseyside BioBank	
Buckinghamshire and Milton Keynes Environmental Records Centre (BMERC)	Norfolk Biodiversity Information Service	
Cambridgeshire and Peterborough Environmental Records Centre (CPERC)	North and East Yorkshire Ecological Data Centre	
Cornwall and the Isles of Scilly, Environmental Records Centre for	North York Moors National Park Authority	
Cumbria Biodiversity Data Centre	Northamptonshire Biodiversity Records Centre	
Derbyshire Biological Records Centre (DBRC) c/o Derbyshire Wildlife Trust	Northumberland Wildlife Trust	
Devon Biodiversity Records Centre	Nottinghamshire Biological and Geological Record Centre	
Doncaster Local Records Centre	Nottinghamshire Wildlife Trust	
Dorset Environmental Records Centre	RECORD LRC for The Cheshire Region	
Dorset Wildlife Trust	Sheffield & Barnsley BRCs (Sheffield City Ecology Unit)	
EcoRecord (Birmingham)	Shropshire Mammal Group c/o Shropshire Wildlife Trust	
Environmental Records Information Centre North East	Somerset Environmental Records Centre	
Essex Wildlife Trust	Staffordshire Ecological Record	
Essex Wildlife Trust Biological Records Centre	Suffolk Biodiversity Information Service	
Gloucestershire Centre for Environmental Records	Suffolk Wildlife Trust	
Greater Manchester Local Record Centre (GMLRC)	Surrey Biodiversity Information Centre	
Greenspace Information for Greater London	Sussex Biodiversity Record Centre	
Hampshire & Isle of Wight Wildlife Trust	Tees Valley Wildlife Trust (data provided by ERIC NE)	
Hampshire Mammal Group	Thames Valley Environmental Records Centre	
Herefordshire Biological Records Centre	Warwickshire Biological Records Centre	
Hertfordshire & Middlesex Wildlife Trust	Warwickshire Wildlife Trust	
Herts Environmental Records Centre c/o Herts & Middlesex WT	West Yorkshire Ecology Service	
Isle of Wight Local Records Centre	Wiltshire and Swindon Biological Records Centre	
Kent and Medway Biological Records Centre	Worcestershire Biological Records Centre	
Lancashire Environment Record Network	Yorkshire Wildlife Trust	

SCOTLAND	WALES
Argyll Biological Records Centre	Brecon Beacons National Park Authority
Cairngorms Water Vole Conservation Project	Gwent Wildlife Trust
Caithness Biodiversity Information Group	Natural Resources Wales
Fife Nature Records Centre (FNRC)	Radnorshire Wildlife Trust
Forestry & Land Scotland (formerly Forestry Commission Scotland)	Wildlife Trust of South & West Wales
Glasgow Museums Biological Records Centre	Wildlife Trusts Wales/ Ymddiriedolaethau Natur Cymru
Highland Biological Recording Group	Cofnod (North Wales)
John Muir Trust	Powys and BBNP Biodiversity Information Service
NBN Atlas	South East Wales Biodiversity Records Centre
North East Scotland Biological Records Centre	West Wales Biodiversity Information Centre
Perth Museum Biological Records Centre	
Scottish Invasive Species Initiative	NATIONAL
Scottish Natural Heritage	People's Trust for Endangered Species
South West Scotland Environmental Information Centre	
The McManus: Dundee's Art Gallery and Museum	
The Wildlife Information Centre (SE, Lothian, Borders and part-central Scotland)	