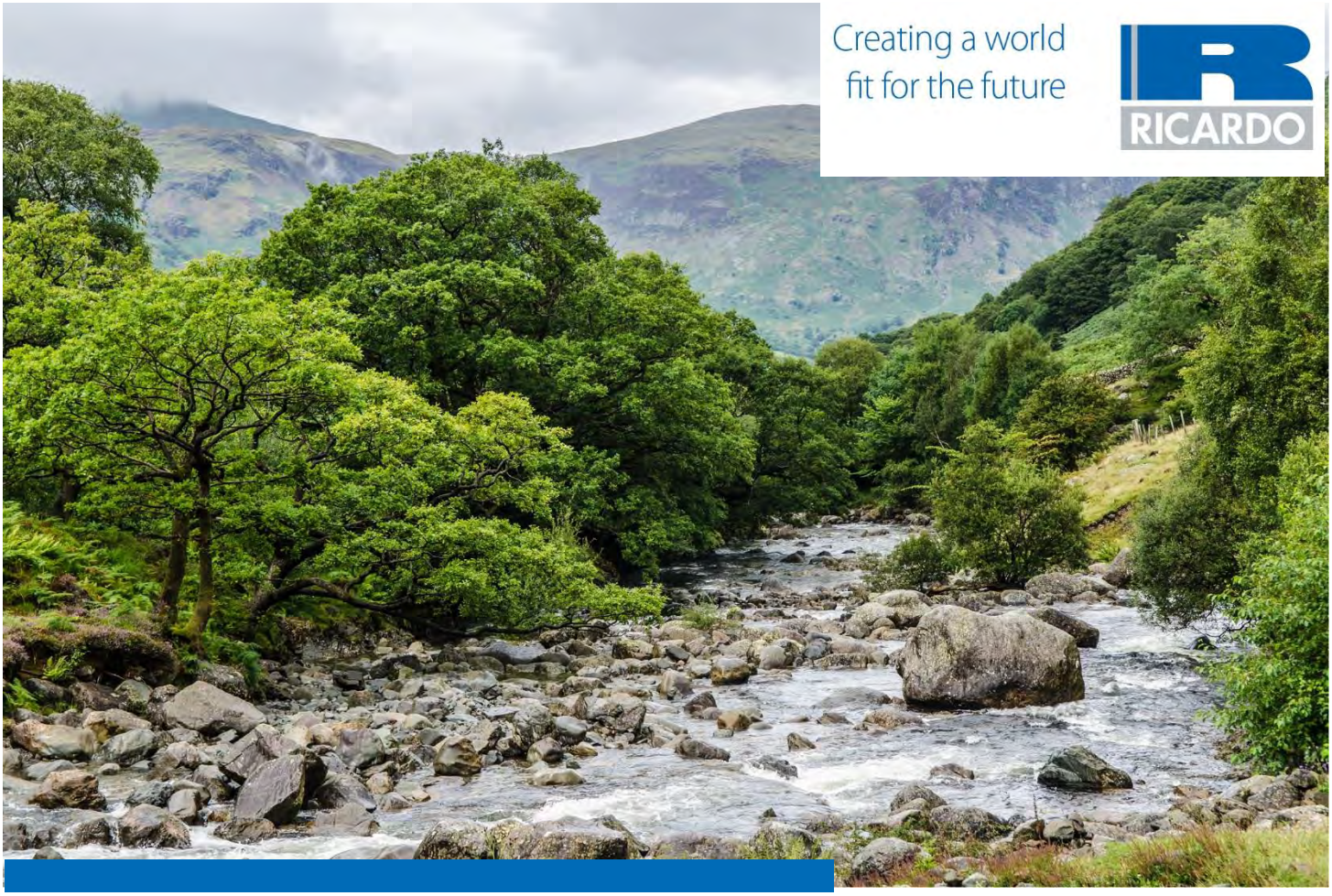

Haweswater Aqueduct Resilience Programme

Bowland Environmental Statement

Technical Appendix 9B.3:

Water Vole Baseline

LCC_RVBC-BO-TA-009-02-003

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Contact:

Anne Fairhead
Ricardo Energy & Environment
Bright Building, First Floor
Manchester Science Park
Manchester, M15 6GZ
United Kingdom

T: +44 (0) 1235 753 488

E: anne.fairhead@ricardo.com

Author:

Tom Priestley, Ryan Hale, Martin Ferreira

Approved by:

Anne Fairhead

Date:

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Table of Contents

1 Introduction

This report is a technical appendix to Chapter 9B Aquatic Ecology of the HARP Proposed Bowland Section Environmental Statement. The purpose of the report is to identify the baseline condition of the populations of water voles (*Arvicola amphibius*) within watercourses within the Proposed Bowland Section study area to inform the Ecological Impact Assessment (EcIA) and the associated mitigation strategy presented in Chapter 9B Aquatic Ecology.

This report presents baseline ecological data collated from a desk study of existing water vole records, habitat suitability surveys, and presence/absence surveys of watercourses within of watercourses within the Proposed Bowland Section study area.

2 Methodology

The methodology for surveying for water voles in relation to developments follows the guidance set out in the Water Vole Mitigation Handbook[1] and includes an assessment of the (relative) suitability of the habitat for water voles and a search for field signs indicating the presence, or possible presence, of water voles.

2.1.1 Desk study

Historic records of water vole from within 2km of the proposed scheme were requested from the local environmental records centres: the Cumbria Biodiversity Data Centre (CBDC) and Lancashire Environmental Records Network (LERN).

2.1.2 Habitat assessment

An assessment of the habitat provided by the waterbody was undertaken during the initial survey visit in October 2019 as part of the Extended Phase 1 survey undertaken by Bowland Ecology in 2019 (Phase 1 Technical Appendix 9A.2 (LCC_RVBC-BO-TA-009-01-002) to Chapter 9A of the Bowland Environmental Statement) and updated to identify any significant change during the second survey visit in April 2020 (see **Annex 1**). This assessment was based on the consideration of numerous factors, such as the presence of dry areas above water level for nesting, burrow entrances, bank profile, bank substrate, hydrology, herbaceous vegetation to provide food, cover, and escape routes from predators.

2.1.3 Searching for field signs

Searches were undertaken for field signs as described in the Water Vole Conservation Handbook[2] and Water Vole Mitigation Handbook[3]. The presence of water vole may be indicated by the following signs:

- Burrows
- Faeces and/or latrines
- Feeding stations
- Other feeding signs (e.g. grazed ‘lawns’ outside burrow entrance)
- Above-ground nests
- Paths or runways
- Footprints (although rarely distinguishable from rat)
- Direct observation of water voles

The presence of any field signs that indicate the presence of key predators, such as American mink (*Mustella vison*) or water vole, were also searched for as well as evidence of other potential predators, such as cats and foxes were also noted, where identified.

[1] Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series).
[2] Strachan, R., Moorhouse, T. and Gelling, M. (2011) Water Vole Conservation Handbook. Third Edition.
[3] Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series).

The optimum period for determining the presence of water vole is during the breeding season, during which latrines are regularly visited and marked. As per the Water Vole Mitigation Handbook (2016), two survey visits were undertaken at each watercourse.

The initial surveys for field signs undertaken by Bowland Ecology were completed in 2019 for the following water courses:

- Cod Gill
- Unnamed Watercourse 169
- Unnamed Watercourse 178
- Unnamed Watercourse 186
- Unnamed Watercourse 384

The results of the surveys undertaken in 2019 are summarised in Section 4.1.2 and are shown in full in Annex 1.

Additional watercourses subject to detailed surveys for water vole field signs by RSK Biocensus on behalf of Ricardo Energy and Environment in April 2020 were:

- Cod Gill
- Unnamed Watercourse 169
- Unnamed Watercourse 384
- River Hodder

The full results of the water vole surveys undertaken in 2020 are summarised in Section 4.1.and are presented in full in Annex 2 of Technical Appendix 9B.2 otter baseline (LCC_RVBC-BO-TA-009-02-002) : RSK Biocensus (2020) – Haweswater Aqueduct Resilience Programme: Otter and Water Vole report – TR3 Bowland.

2.1.4 Weather conditions and survey dates

The weather conditions and survey dates for the water vole field signs surveys are shown below in **Table 2.1** for surveys in 2019 and **Table 2.2** for surveys in 2020.

Table 2.1: Surveys dates and weather conditions for the 2019 water vole field sign surveys

Survey Date	Cloud cover	Wind speed (Beaufort scale) and direction	Temperature (°C)	Precipitation
24/10/2019	6/8	F2	9°C	No precipitation
29/10/2019	8/8	F3	12°C	No precipitation

Table 2.2: Surveys dates and weather conditions for the 2020 water vole field sign surveys

Survey Date	Weather conditions
23/04/2020	22°C, sunshine, clear skies, still. No precipitation during the survey and no rainfall was recorded in the week preceding the surveys.

2.1.5 Assumptions and Limitations

Absence of desk study records cannot be relied upon to infer absence of a species/habitat. Often, the absence of records is a result of under-recording within the given search area.

The surveys undertaken in October 2019 were carried out during an exceptionally wet autumn. Whilst the surveys were not carried out during or immediately after periods of heavy rain fall and the subsequent high water levels, the intervals between high water levels were not considered sufficiently long enough to allow water voles to remark territories and re-establish signs typical of their presence. As a result, whilst the weather conditions were suitable for undertaking the surveys, the river conditions were sub-optimal.

The timings of the surveys undertaken in 2020 are considered optimal for both water vole and the surveys were not compromised by poor weather. Surveyors were able to access the full extent of each watercourse therefore, there were no obvious constraints to undertaking the surveys.

3 Baseline Conditions

3.1.1 Desk study

The data received from LERN (the local environmental records centre) for within 2 km of the proposed scheme contained no records of water vole from the River Hodder or river Hindburn catchments.

3.1.2 Survey Results

Ten watercourses were assessed as being unsuitable to support water voles and were not subject to surveys for water vole field signs. The watercourses scoped out for requiring surveys for water vole field signs following the Extended Phase 1 survey or habitat suitability assessment are shown in **Error! Reference source not found.**

Four watercourses were surveyed for water vole field signs in the Hindburn catchment: Cod Gill, Unnamed Watercourse 169, Unnamed Watercourse 178, and Unnamed Watercourse 186. All four watercourses were assessed as having low suitability for water voles. No evidence of water voles was identified in during the initial surveys in October 2019 but potential evidence of water voles was identified during the second surveys in April 2020. Burrows were identified adjacent to the watercourses during the second surveys in 2020. However, in the absence of definitive evidence i.e. latrines, or additional records within the catchment, it is considered unlikely that water vole are present at the watercourses in the Hindburn catchment. Due to the small size and presence of feeding remains it is likely that he burrows and feeding station are attributable to bank voles (*Myodes glareolus*).

Two watercourses were surveyed for water vole field signs in the River Hodder catchment: River Hodder and Unnamed Watercourse 384. Both watercourses were assessed as having low suitability for water voles. No evidence of water voles was identified in during the initial surveys at Unnamed Watercourse 384.Potential evidence of water voles was identified surveys at the River Hodder including two burrows. However, in the absence of definitive evidence i.e. latrines, or additional records within the catchment, it is considered unlikely that water vole are present at the watercourses in the Hodder catchment. Due to the small size and presence of feeding remains it is likely that he burrows and feeding station are attributable to bank voles.

The results of the surveys of watercourses for water vole field signs and habitat suitability undertaken in 2019 and 2020 are summarised in **Table 3.2**.

Table 3.1 Watercourses scoped out of surveys for water vole field signs

Watercourse name	WFD catchment	Results of scoping exercise
Unnamed Watercourse 857	Croasdale Beck	Not suitable for water vole
Unnamed Watercourse 978	Croasdale Beck	Not suitable for water vole
Unnamed Watercourse 1248	Croasdale Beck	Not suitable for water vole
Unnamed Watercourse 346	Croasdale Beck	Not suitable for water vole
Unnamed Watercourse 347	Croasdale Beck	Not suitable for water vole
Unnamed Watercourse 1317	Hindburn	Not suitable for water vole
Unnamed Watercourse 158	Hindburn	Not suitable for water vole
Unnamed Watercourse 163	Hindburn	Not suitable for water vole
Unnamed Watercourse 180	Hindburn	Not suitable for water vole
Unnamed Watercourse 209	Hindburn	Not suitable for water vole

Table 3.2 Watercourses surveyed for water vole field signs in 2019 and 2020

Watercourse name	WFD catchment	Upstream NGR	Downstream NGR	Habitat suitability	Water vole Field signs present – 2019 survey	Water vole Field signs present – 2020 survey
Cod Gill	Hindburn	SD63236554	SD63746579	Low	No evidence of water vole identified	Potential water vole evidence recorded
Unnamed Watercourse 169	Hindburn	SD63486511	SD63446553	Low	No evidence of water vole identified	Potential water vole evidence recorded
Unnamed Watercourse 178 Unnamed Watercourse 186	Hindburn	SD64016389	SD64166390	Low	No evidence of water vole identified	Potential water vole evidence recorded
Unnamed Watercourse 384	Hodder - conf Easington Bk to conf Ribble	SD68645043	SD69015005	Low	No evidence of water vole identified	No evidence of water vole identified
River Hodder	Hodder - conf Easington Bk to conf Ribble	SD6923149703	SD6887649580	Low	Potential water vole evidence recorded	Potential water vole evidence recorded

4 Summary

4.1 Summary

No evidence of water voles was identified at any watercourses surveyed in 2019 and 2020 in either the River Hodder or Hindburn catchments. Due to the absence of definitive field signs and lack of historic desk study records it is concluded that water voles are absent from the watercourses adjacent to the Proposed Bowland Section.

Due to the absence of water voles from the adjacent watercourses no further survey or mitigation is required for the Proposed Bowland Section.

Annexes

Annex 1: Bowland Ecology (2019) – TR3 Water vole Survey Data Report

TR3 Ecology Survey Data Report: Water Vole

1 Project Details			
Project Name:	Haweswater Aqueduct Resilience Programme	Project Number:	80061155
Written:	Ellen Milner, *Principal Ecologist*	Approved:	Alice Helyar, *Principal Ecologist*
Report reference:	TR3 Water Vole Survey Report 2019 V1 TR3 Water Vole Survey Report 2019 V2	Date:	04/11/2019 24/06/2020
2 Project Drawings			
TR3 Water Vole Survey Plans – October 2019 (Ref: BOW167_HARP_9.5_WV_TR3)		Sheets TBC	
3 Ecology Surveys			
Surveyors:	Sabina Ostalowska MSc BSc ACIEEM Mark Breaks BSc (Hons) Abi Hamer BSc (Hons)		
Survey date(s):	24/10/2019, 29/10/2019		
Survey Method:	An initial habitat assessment was undertaken as part of the Extended Phase 1 survey to determine the requirement for detailed water vole (*Arvicola amphibius*) surveys. This was based on whether or not the feature supports the habitat preferences of water vole, specifically: dry areas above the water level for burrows, herbeaceous vegetation for food and cover, and water as a means of escape from predators. Surveys were undertaken in accordance with The Water Vole Mitigation Handbook (2016), searching the watercourse for field signs of water vole, as described in The Water Vole Conservation Handbook, 3rd Edition (2011). This includes droppings, latrine sites, burrows, feeding stations/feeding remains, tracks/footprints. Field signs of species which could easily be confused with water vole, such as those of brown rat (*Rattus norvegicus*) and bank vole/field vole (*Myodes glareolus/Microtus agrestis*) along with evidence of any species known to predate upon water vole e.g. American mink (*Neovision vison*).		
Weather Conditions:	24/10/2019: Cloud cover 6/8, Wind Beaufort F2, 9°C, no precipitation. 29/10/2019: Cloud cover 8/8, Wind Beaufort F3, 12°C, no precipitation.		
Limitations to the survey:	The surveys were undertaken during an exceptionally wet autumn. Whilst the surveys were not carried out during or immediately after periods of heavy rainfall and subsequent high water levels, the intervals between high water levels were not considered long enough to allow water vole to re-mark territories and re-establish field signs typical of their presence. As a result, whilst the weather conditions were suitable for undertaking the surveys, the watercourse conditions were sub-optimal. This report is based on a single visit only.		
4 Survey Results			
TR3.WC6			

	Upstream: SD63236554 Downstream: SD63626570 No evidence of water vole. Considered to be low suitability. A ditch with running water, with steep earth and rock-cliff banks. The water depth is less than 0.5 m. The bordering vegetation is grazed upland grassland. The ditch is approximately 1 m wide and has areas of slow flowing water and faster flowing sections. The bankside vegetation comprises dominant rushes, with occasional bankside trees, bushes and short grass. Small amounts of submerged vegetation were noted. There is no evidence of human disturbance.
TR3.WC7	
	Upstream: SD63486511 Downstream: SD63446553 (joins TR3.WC6) No evidence of water vole. Considered to be low suitability. A ditch with running water and shallow earth banks. The water depth is approximately 0.1 m. The bordering vegetation is grazed upland grassland. The ditch is approximately 0.3 m, wide with a slow flow of water. The bankside vegetation comprises abundant rushes, with occasional short grasses, bushes, and more rarely bankside trees. There is no evidence of human disturbance.
TR3.WC31	
	Upstream: SD64016389 Downstream: SD64166390 No evidence of water vole. Considered to be low suitability. Stoat (*Mustela erminea*) droppings at upstream limit of survey area. A ditch with running water and shallow banks comprising stones and earth. The water depth is less than 0.5m. The bordering vegetation is grazed upland grassland. The ditch is approximately 1 m wide, with a fast flow of water. The bankside vegetation comprises frequent rushes, with occasional short grasses and more rarely bushes. There is no evidence of human disturbance.
TR3.WC66/67	

	Upstream: SD68685036 Downstream: SD68935011 (several directions of flow) No evidence of water vole. Considered to be low suitability. A ditch with running water and flat (<10°) banks comprising earth. The water depth is less than 0.5 m. The bordering vegetation is grazed grassland. The ditch is less than 1 m wide, with a slow flow of water. The bankside vegetation comprises abundant grasses with with occasional herbs. There are frequent bankside bushes. There is no evidence of human disturbance.

References

Dean, M., Strachan, R., Gow, D., and Andrew, R. (2016) *Water Vole Mitigation Handbook*: The Mammal Society Mitigation Guidance Series.

Strachan, R., Moorhouse, T. and Gelling, M. Water Vole Conservation Handbook, Third Edition (2011). WildCRU, University Of Oxford.

T: +44 (0) 1235 753000
E: enquiry@ricardo.com
W: ee.ricardo.com