

M5 Junction 10 Improvements Scheme

Environmental Statement Appendix 7.7 Water Vole surveys TR010063 – APP 6.15

Regulation 5 (2) (a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Infrastructure Planning Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

M5 Junction 10 Improvements Scheme Development Consent Order 202[x]

6.15 Environmental Statement: Appendix 7.7 Water Vole surveys

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1. Introduction

1.1. Terms of Reference

- 1.1.1. Atkins, a member of the SNC Lavalin Group, was commissioned by Gloucestershire County Council (GCC) to undertake water vole (*Arvicola amphibius*) surveys to inform the Environmental Statement (ES) for the M5 Junction 10 Improvements Scheme (hereafter referred to as ‘the Scheme’).
- 1.1.2. The purpose of the water vole surveys was to determine whether water vole are present or likely absent within the Scheme Boundary; provide recommendations to enable compliance with legislation and policy; and, if necessary, identify the need for avoidance, mitigation, compensation or enhancement measures.
- 1.1.3. This Technical Appendix summarises the results of the water vole surveys undertaken, including the methods used, results of the field surveys, and provides an evaluation of the nature conservation value of water vole and their habitats within the survey area.
- 1.1.4. This report provides factual information to support the ES, which will accompany the planning application for the Scheme.

1.2. Legislation

- 1.2.1. Relevant legislation in relation to water vole is provided in Table 1-1 below.

Table 1-1 - Summary of Relevant Legislation

Species/Habitat	Legislation	Offences	Licensing procedures and guidance
Water vole	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally kill, injure, or take water voles; intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection or disturb a water vole in such a place.	Mitigation and conservation licences issued for trapping and translocation operations by Natural England. Certain displacement operations can be carried out under a class licence. Guidance documents: <ul style="list-style-type: none"> • The Water Vole Conservation Handbook (R. Strachan & T. Moorhouse, Wildlife Conservation Research Unit, 3rd Edition 2011); • Water voles and development licensing policy - NE Technical Information Note TIN042 2008; • NE Standing Advice for protected species 2013; • The Water Vole Mitigation Handbook (M. Dean, R. Strachan, D. Gow & R. Andrews 2016).

2. Methodology

2.1. Introduction

- 2.1.1. The term 'Scheme Boundary' refers to the Order limits, excluding areas of the Order limits that extend approximately 2 km north and 2 km south of the Scheme alignment, along the M5. In these locations the Scheme Boundary is the Scheme alignment. The Order limits and the Scheme alignment are shown on Figure 7-7A in Appendix A.
- 2.1.2. Within the areas of the Order limits that extend north and south of the Scheme alignment, the only works proposed are the installation of signs in discrete locations, which will require vegetation clearance of up to approximately 20 m² plus some minor trimming back of vegetation up to a distance of 180 m in front of the sign to ensure visibility. These signage locations can be micro sited to avoid/ minimise ecological impacts. These small-scale works are consistent with routine highway maintenance works. The results of desk study and field surveys here would not have any bearing on the impact assessment for the Scheme, and these areas have been excluded from assessments to inform the ES. Pre-construction surveys of the discrete signage locations and working with the contractor to micro site locations where appropriate to avoid or minimise ecological impacts will be undertaken and is considered to be proportionate.

2.2. Desk Study

- 2.2.1. The Defra MAGIC website¹ was reviewed to identify statutory designated nature conservation sites within 2 km of the Scheme Boundary citing water vole as a reason for designation. Desk study records of non-statutory designated sites for nature conservation within 1 km of the Scheme Boundary were requested from Gloucestershire Centre for Environmental Records (GCER) in September 2019 and again in April 2021 and July 2022, to identify those citing water vole as a reason for designation.
- 2.2.2. GCER also provided recent records² of water vole from within 1 km of the Scheme Boundary.

2.3. Survey Area Selection

- 2.3.1. All watercourses and water bodies within the Survey Area were identified from multiple mapping sources: Ordnance Survey (OS) mapping and publicly available aerial imagery, and data recorded during the extended Phase 1 habitat surveys carried out for the Scheme by Atkins (in May and September 2019).
- 2.3.2. Watercourses are defined as rivers and streams (where regularly flowing water was identified) and ditches/ drains (where it is assumed that the channels contain standing water during normal conditions, and/or regularly dry out).
- 2.3.3. Waterbodies are defined as ponds (man-made or natural standing water bodies less than 20,000 m² or 2 ha), lakes (man-made or natural standing water bodies greater than 20,000 m² or 2 ha), or canals (artificial waterway with standing water).
- 2.3.4. Watercourses and waterbodies have been considered for water vole field surveys where the habitat feature is located within 500 m of the Scheme Boundary (the Water Vole Survey Area).
- 2.3.5. The Water Vole Survey Area, including the habitat features which were surveyed in 2019, 2020 and 2021, is shown in Figure 7-7A in Appendix A.

¹ Defra. c2019. Magic Map Application. [Online]. [Accessed July 2021]. Available from: <https://magic.defra.gov.uk/MagicMap.aspx>

² Records of observations within the last 10 years.

2.4. Field Survey

2.4.1. The water vole surveys were carried out by suitably experienced ecologists and the methodology broadly follows good practice guidance^{3,4} and Chartered Institute of Ecology and Environmental Management (CIEEM) competencies for undertaking water vole surveys⁵.

Habitat suitability assessment

2.4.2. Water vole habitat suitability assessment surveys were carried out in July/ September/ November 2019, and March/ July 2021 (where access allowed). The exact date of surveys undertaken at each habitat feature is provided within Appendix B.

2.4.3. The habitat suitability assessments were undertaken for habitat features identified within the Water Vole Survey Area and to determine the scope of more detailed water vole surveys. The assessments considered the habitat preferences of water vole, specifically:

- Dry areas above water level for nesting (burrows or above ground nests).
- Bank profile (steep banks are preferred, though not essential, as water vole may exploit shallower profiles).
- Bank substrate suitable for burrowing.
- Presence, density, and type of vegetation on bank and in channel to provide food and cover.
- Shading of the watercourses (excessively shaded watercourses are of lower suitability).
- Water level and typical fluctuations.
- Water level as a means of escape from predators.
- Connectivity to other suitable habitat (including potential barriers such as busy roads and large areas of hard standing which may affect water vole movement).

2.4.4. During the habitat suitability assessment, any habitat features that were considered to be unsuitable to support water voles were ruled out of further assessment. Where habitat was deemed suitable to support water vole, a detailed survey for field signs was undertaken (see below).

Presence/ likely absence surveys

2.4.5. Where habitat was considered suitable for water vole, a detailed search for signs of water vole presence was undertaken along the habitat feature where it lies within 500 m of the Scheme Boundary (the Water Vole Survey Area). The first surveys were carried out immediately following the habitat suitability assessment surveys undertaken in September 2019. A second presence/ likely absence survey at each suitable habitat feature was undertaken in June 2020 (where access allowed). The exact date of surveys undertaken at each habitat feature is provided within Appendix B.

2.4.6. Surveyors conducted a detailed search along the watercourse and waterbody banksides⁶ (where access allowed) for field signs of water vole including:

- Burrows.
- Runs.
- Droppings.

³ Strachan, R. and Moorhouse, T. (2011). Water Vole Conservation Handbook (3rd edition). Wildlife Conservation Research Unit, University of Oxford.

⁴ Dean, M. et al The Water Vole Mitigation Handbook (2016). Mammal Society.

⁵ CIEEM (April, 2013) Competencies for Species Survey: Water Vole.

⁶ The strip of marginal vegetation at the toe of the watercourses bank extending at least 1 m out into the water and at least 1 m up the bank.

- Latrines.
- Prints.
- Hearing distinctive sound of water vole entering water.
- Feeding remains.
- Direct observation.

2.4.7. In addition, field signs of American Mink (a key predator of water vole) were recorded if encountered within the Water Vole Survey Area, including footprints and droppings (scat).

2.4.8. Water vole presence/ likely absence surveys were scheduled to be carried out during dry weather with no heavy rainfall recorded within the previous two days, in order to avoid conditions where positive field signs have been washed away.

2.5. Assessment

2.5.1. The water vole population has been valued in a geographical context following the framework provided in LA 108⁷. The evaluation is based on the information gathered from the desk study and field surveys, using a combination of professional judgement and accepted criteria⁸ (e.g. diversity, rarity and naturalness).

2.6. Limitations

2.6.1. The following limitations were encountered:

- GCER do not hold exhaustive records of all the species that occur within a given area. Therefore, the absence of records for a particular species does not demonstrate that the species is absent. This limitation has been factored into the assessment, which does not rely solely on desk study data.
- The desk study search for waterbodies (including ponds and wet ditches) within 500 m of the Scheme Boundary was undertaken by using Ordnance Survey plans and aerial photographs only. These sources may not show all waterbodies and therefore some waterbodies may not have been identified and have not been included in the surveys. These limitations have been factored into the assessment, which does not rely solely on desk study data.
- Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. Therefore, the absence of evidence of any particular species including water vole should not be taken as conclusive proof that the species is not present or that it will not be present in the future.
- There were several habitat features within the Water Vole Survey Area which could not be accessed during the water vole presence/ likely absence surveys due to no land access being granted by the landowner; Pond 18, Pond 19, Pond 20, Pond 25, and Pond 39. These waterbodies will not be impacted by the Scheme, and there is limited suitable habitat providing connectivity to the proposed working areas. On this basis, impacts to water vole are considered unlikely.
- The section of Piffs Elm ditch (Drain 22) to the east of the M5 could not be accessed due to no land access being granted by the landowner. However, the section of the ditch to the west of the M5 was fully surveyed and a review of aerial imagery and mapping has been completed to make an assessment of likely habitat suitability for water vole on the eastern side (including likely shading by adjacent woodland, and connectivity to other suitable habitats).

⁷ Highways England. March 2020. LA 108 Biodiversity [Online]. [Accessed October 2020]. Available from: https://www.standardsforhighways.co.uk/dmrb/search?discipline=SUSTAINABILITY_AND_ENVIRONMENT

⁸ Set out in Ratcliffe, D.A (1977). A Nature Conservation Review. Cambridge University Press.

- Sections of the River Chelt channel could not be accessed during the water vole presence/ likely absence surveys due to steep riverbanks and high-water levels. In addition, dense vegetation prevented full access to survey some habitat features including Leigh Brook, MW5, Pond 17, Pond 22, Pond 23, Pond 24, and Pond 30. However, these habitats were surveyed using binoculars from accessible points and therefore this is not considered to be a significant limitation.
- During the water vole presence/ likely absence surveys, access was not permitted by the landowners to MW1, Drain 1, Drain 2, Pond 1, Pond 2, Pond 3, Pond 4, Pond 5, Pond 6, Pond 28 and Pond 29. Steep riverbanks, high water levels and dense vegetation on the banks restricted access into sections of the River Swilgate channel. Dense vegetation and adjacent fencing/walls also prevented full access to survey Pond 7, Pond 9, Pond 10, and Pond 21. However, following a change in the Scheme footprint, these habitat features are no longer within the Water Vole Survey Area and they are not discussed further within the assessment.

2.6.2. Note that specific limitations encountered during the water vole presence/ likely absence surveys are provided for each habitat feature in Appendix B.

3. Results

3.1. Desk Study

- 3.1.1. GCER provided no records of water vole within 1 km of the Scheme Boundary.
- 3.1.2. There are no designated sites citing water vole as a reason for designation located within 2 km of the Scheme Boundary.

3.2. Field Survey

Habitat Suitability Assessment

- 3.2.1. Habitat suitability assessments for all habitat features surveyed within the Water Vole Survey Area are provided in full in Appendix B. Note that some habitat features surveyed are no longer within the Water Vole Survey Area (following a change in the Scheme footprint), and therefore these features will not be discussed further in this assessment.
- 3.2.2. Suitable riparian habitats for water vole have been recorded within the Water Vole Survey Area, along the River Chelt and connecting minor watercourses MW4. Therefore, water vole presence/ likely absence surveys were carried out for these habitat features (see results below).
- 3.2.3. Many of the ditches and ponds located within the Water Vole Survey Area are not considered to provide suitable habitat for water vole or have been scoped out due to their isolated location. No further surveys were undertaken in relation to water vole at these habitat features.
- 3.2.4. In addition, there were several habitat features within the Water Vole Survey Area which could not be accessed to undertake a habitat suitability assessment due to no land access being granted by the landowner; these comprise Pond 18, Pond 19, Pond 20, Pond 25 and Pond 39.

Presence/ likely absence surveys

- 3.2.5. The findings of the presence/ likely absence surveys carried out for habitat features surveyed within the Water Vole Survey Area are provided in full in Appendix B.
- 3.2.6. During the water vole presence/likely absence surveys carried out September/ November 2019 and June/ July 2020, no positive evidence of water vole was recorded within the habitat features surveyed (River Chelt and MW4).

4. Evaluation

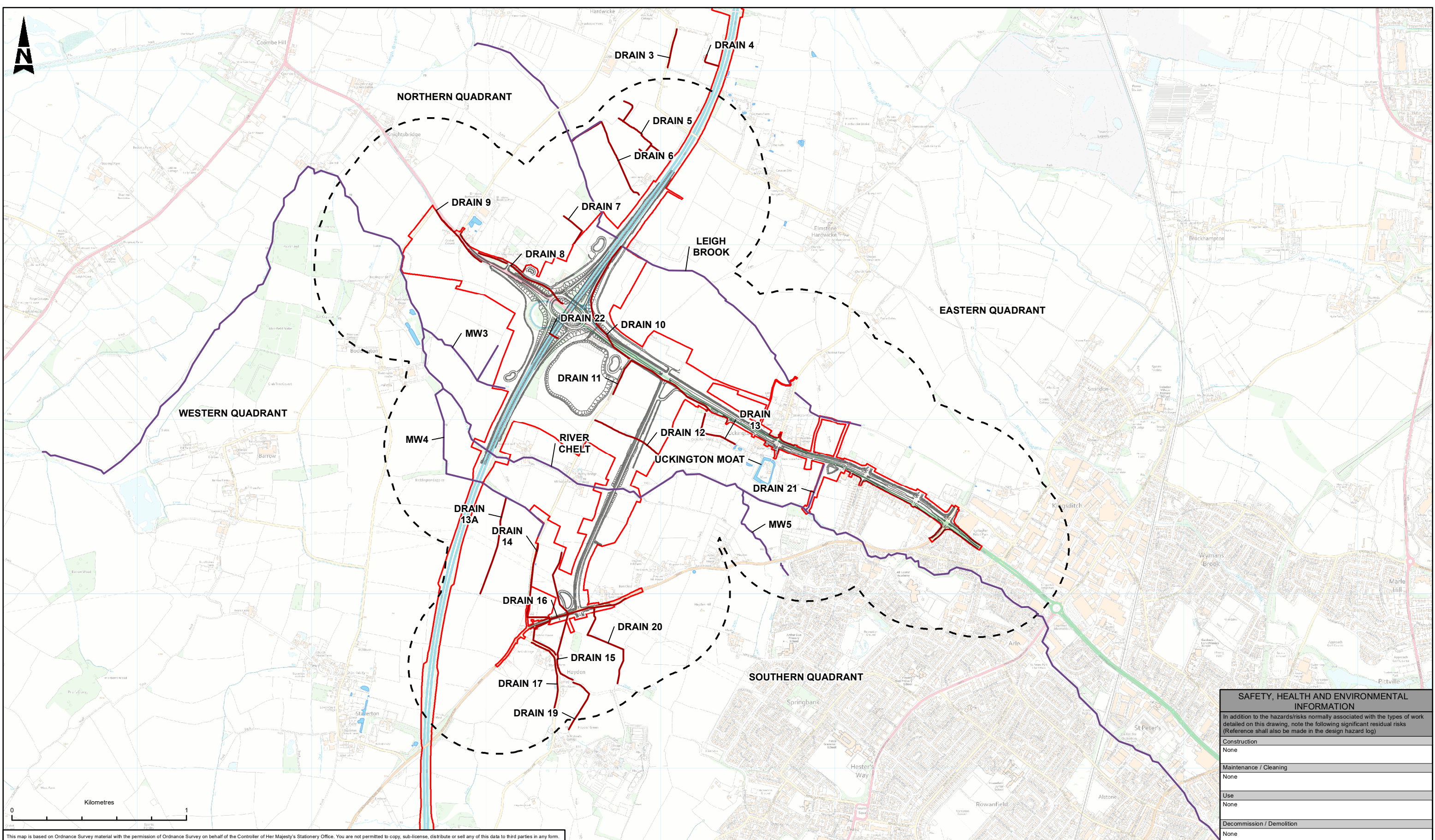
- 4.1.1. No evidence of water vole has been recorded within the Water Vole Survey Area.
- 4.1.2. There are five ponds (Pond 18, Pond 19, Pond 20, Pond 25 and Pond 39) which could not be accessed to carry out a habitat suitability assessment for water vole. However, none of these ponds will be directly affected by the Scheme. Pond 18, Pond 19 and Pond 20 are located over 400 m from the Scheme Boundary. Pond 39 is located approximately 80 m to the north of the nearest proposed works on the A4019 (west of the M5). Pond 25 is located approximately 50 m to the south of the nearest proposed works on the A4019 and Moat Lane (east of the M5). There is limited suitable habitat providing connectivity between these ponds and the Scheme. In addition, other habitat features located within 500 m of these ponds (within the Water Vole Survey Area) had no positive water vole evidence recorded or were scoped out of the assessment, and therefore it is considered unlikely that isolated water vole populations will be present within these ponds.
- 4.1.3. Following the water vole surveys and assessment, and considering the lack of water vole records within the surrounding area, it is considered that water vole are **likely absent** from the study area. Therefore, no impacts to water vole are anticipated as a result of the proposed works.

Appendices



Appendix A. Schedule of figures included in this application document

Figure reference	Document title	Sheet	Document number	Revision
7-7A	Water vole survey areas	1 of 1	GCCM5J10-ATK-EBD-ZZ-GS-GI-000017	0



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SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION	
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made in the design hazard log)	
Construction	None
Maintenance / Cleaning	None
Use	None
Decommission / Demolition	None

LEGEND	
	ORDER LIMITS
	SCHEME ALIGNMENT
	500M STUDY AREA
OTTER SURVEY LOCATIONS	
	WATERCOURSE
	DRAIN
	PONDS

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
PUBLISHED							

Drawing Suitability: **PUBLISHED**

Status: **A1**





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Project Title		M5 Junction 10 Improvements Scheme	
Drawing Title		FIGURE 7-7A WATER VOLE SURVEY AREAS	
Drawing Number		Project: GCCM5J10 - ATK - EBD Original: ZZ - GS - GI - 000017	
Original Size: A3	Scale: 1:20,000	Project Ref: 5214106	Sheet: 1 of 1 Rev: P02



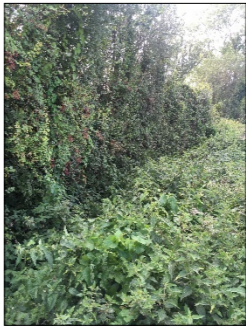
Appendix B. Water Vole Survey Results


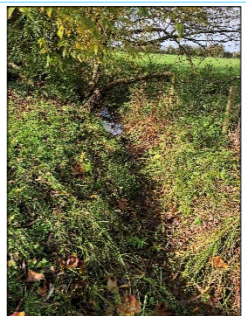


Habitat Feature	Date surveyed	Survey Limitations	Habitat Description	Water Vole Survey Results	Site Photographs	Further surveys proposed?
River Swilgate	-06/09/2019 (east of M5) -04/11/2019 (west of M5)	Access into the River Swilgate channel was restricted along sections of this watercourse due to steep banks, high water levels and dense vegetation. Where possible, these habitats were surveyed using binoculars from safe, accessible locations, and this is therefore not considered to be a significant limitation.	<p>The River Swilgate is a river which flows in a north-westerly direction through agricultural fields and beneath the M5. The channel width varies within the survey area, and moderate water levels (slow-moving) were recorded during the September and November 2019 surveys. The riverbanks comprise stone walls on both approaches to the M5 culvert. There are some gaps in the stonework although these could not be inspected in more detail. The remaining earth banks are mostly steep, although these become shallower at the meanders.</p> <p>The river passes beneath the M5 through a large box culvert which is at an angle (resulting in poor visibility through the culvert).</p> <p>To the east of the M5 and on the western approach to the M5, the river channel is mostly heavily shaded by areas of woodland and dense scrub vegetation along both banks of the river. There are short sections of open unshaded banks further east and west from the M5 which are vegetated with grasses and tall ruderal species including nettles, willowherb, teasel, cow parsley, and extensive Himalayan balsam. No emergent vegetation was recorded within the channel.</p> <p>Adjacent land use comprises open fields (pasture and arable). Poor water quality was recorded within the river.</p>	<p>Possible presence (surveys incomplete).</p> <p>No water vole signs were recorded during the 2019 survey. The earth banks provide suitable substrate for burrow creation. One burrow was seen in the northern bank to the east of the M5, however, this was very high above the water level on a steep bank and is considered more likely that this is a kingfisher burrow. The majority of the channel is considered to provide poor foraging habitat for water vole, although the sections of open unshaded banks offer higher suitability.</p>	  	N/A – no longer within survey area.
River Chelt	-11/09/2019 (east of M5 to Withybridge lane, east of Withybridge lane) -12/09/2019 (west of M5) -20/09/2019 (east of M5 within Cheltenham) -15/06/2020 (M5 east to Withybridge lane, east of Withybridge lane including sections within Cheltenham) -16/06/2020 (west of M5 and section	Access into the River Chelt channel was restricted along sections of this watercourse due to steep banks, high water levels and dense vegetation. Where possible, these sections were surveyed using binoculars from safe, accessible locations, and this is therefore not considered to be a significant limitation.	<p>The River Chelt is a river which flows in a westerly direction through Cheltenham, agricultural fields (pasture and arable) and beneath the M5. The channel varied significantly across the sections within the survey area:</p> <ul style="list-style-type: none"> West of M5 – high and fast-flowing water levels were recorded along this section in 2019 and 2020. The earth and clay banks are tall and steep facing, and generally open and unshaded. The banks are vegetated with grasses and tall ruderal species including extensive Himalayan balsam, with scattered scrub and trees. There are patches of emergent vegetation along the toe of the bank including yellow flag iris, reeds, and sedges. There are areas of woodland adjacent to this section of the River Chelt. The River Chelt passes beneath the M5 in a westerly direction through a large straight-sided 	<p>Likely absent.</p> <p>No water vole signs were recorded during the 2019 or 2020 survey. The River Chelt provides good foraging opportunities for water vole (in channel and on the banks), although these areas are patchy due to areas of heavy shading. The bank substrate varies and there are stretches of steep earth banks which provide suitable substrate for burrow creation. However, there are sections of the bank where the riverbed and bank toe are formed of clay which</p>		No further surveys proposed.




Habitat Feature	Date surveyed	Survey Limitations	Habitat Description	Water Vole Survey Results	Site Photographs	Further surveys proposed?
	east of Withybridge lane) -17/06/2020 (section east of Withybridge lane)		<p>box culvert. It should be noted that an additional box culvert is located south of the M5 culvert and very fast-flowing water was recorded being dispelled into the River Chelt during the 2019 and 2020 surveys. The source of this water is not known, and no watercourse is shown on OS mapping at this location.</p> <ul style="list-style-type: none"> • East of M5 (M5 to Withybridge Lane) – moderate and slower-moving water levels were recorded along this section in 2019 and 2020. The earth and clay banks are tall and steep facing and generally open and unshaded. The banks are vegetated with grasses and tall ruderal species including extensive Himalayan balsam, with scattered scrub and trees. There are dense areas of emergent vegetation along the toe of the bank including sedges, reeds, yellow flag iris, and watercress. There are areas of woodland on either side of the River Chelt on the approach to the M5 crossing. • East of M5 (east of Withybridge Lane) – low and slower-moving water levels were recorded along this section in 2019 and 2020. The earth and clay banks are tall and steep facing with increased tree/ scrub cover which increases shading within the channel. The banks are largely vegetated with grasses. The river meanders in several places, leaving stony and mud beaches within the channel. Emergent vegetation is sparse within the channel but there are patches including sedges and common water crowfoot. On the approach towards Cheltenham, a section of the river has tall and steep artificial stone banks. • East of M5 (within Cheltenham) – water levels varied along this section but were mostly low and fast-flowing in 2019 and 2020. Sections of the banks and adjacent embankments are modified where the river passes beneath several roads and runs alongside residential and commercial properties. The banks are mostly heavily vegetated with trees and scrub, resulting in heavy shading and a sparse vegetation present within the channel. There are patches of emergent vegetation including reeds, yellow flag-iris, and common water crowfoot. 	would not be suitable for burrow creation. It is noted that the River Chelt floods regularly and water levels and velocity were noted to increase significantly during spate conditions, which is considered to reduce the suitability of the habitat for water vole. Surveys have been completed and it is considered that water vole are likely absent along this watercourse.	   	
Unnamed minor watercourse 1 (MW1)	N/A	No survey access (landowner permission not agreed).	The confluence where MW1 meets the River Swilgate could be observed from the opposite bank, and the banks were seen to be densely vegetated with scrub and trees.	N/A	N/A	N/A – no longer within survey area.




Habitat Feature	Date surveyed	Survey Limitations	Habitat Description	Water Vole Survey Results	Site Photographs	Further surveys proposed?
Leigh Brook	-02/09/2019 (west of M5) -06/09/2019 (section east of M5) -18/09/2019 (section east of M5)	Dense scrub vegetation restricted access along short sections of the banks of this watercourse (to the east and west of the M5). Where possible, these sections were surveyed using binoculars from safe, accessible locations, and this is therefore not considered to be a significant limitation.	<p>Leigh Brook comprises a minor watercourse/ stream which flows in a north-westerly direction through agricultural fields (pasture and arable) and passes beneath the M5.</p> <p>To the east of the M5, the channel comprises a field-side ditch which was found to be largely dry during the 2019 survey. The earth banks are mostly shallow, although there is a short section where the banks are taller and steeper. The channel is heavily shaded by adjacent hedgerows and trees. The channel and banks are densely vegetated by ruderal species including nettle and willowherb; however, no aquatic species were recorded.</p> <p>To the west of the M5, the stream channel is heavily shaded by adjacent dense scrub and woodland. The earth banks are shallow sloping and sparsely vegetated, and no vegetation was recorded within the channel. The channel was almost dry with some pools of standing water.</p> <p>The area of woodland adjacent to the stream to the west of the M5 is heavily cattle-poached with sparse understory vegetation.</p>	Likely absent. This watercourse is not considered to be suitable to support water vole.	 	No further surveys proposed.
Unnamed minor watercourse 3 (MW3)	12/09/2019	N/A	This minor watercourse was found to comprise a shallow ditch running alongside a hedgerow at the boundary between two agricultural fields (arable). During the 2019 survey, the channel was completely dry. No aquatic vegetation was recorded although the ditch had been recently managed with all vegetation in the channel and on the bank.	Likely absent. This watercourse is not considered to be suitable to support water vole.		No further surveys proposed.
Unnamed minor watercourse 4 (MW4)	-11/09/2019 (east of M5) -12/09/2019 (west of M5) 16/06/2020 (east and west of M5)	N/A	<p>This is a minor watercourse which runs in a north-westerly direction through agricultural fields (arable) and passes underneath the M5 carriageway through two small tunnel culverts (approximately 1 m in width). The watercourse joins the River Chelt approximately 420 m to the north-west of the M5.</p> <p>To the east of the M5, the channel comprises a field-side ditch with short but steep earth banks. The channel is partially shaded by the adjacent woodland and hedgerow, and it was found to be mostly dry during the 2019 and 2020 survey. There are reeds present within the channel and the banks are vegetated with grasses, nettles, hemlock, and docks.</p> <p>To the west of the M5, the channel widens, and the earth banks are steeper. There was no water present at the time of the 2019 survey and shallow water was present during the 2020 survey. There are reeds and bulrush present within the channel and the banks are largely vegetated by grasses and nettles. This section of</p>	Likely absent. No water vole signs were recorded during the 2019 or 2020 survey. The channel provides good foraging habitat for water vole. In addition, the banks are considered to provide a suitable substrate for burrow creation. However, the low water levels are considered to reduce the likelihood of this watercourse supporting a water vole population. Surveys have been completed and it is considered that water vole are likely absent along this watercourse.	 	No further surveys proposed.


Habitat Feature	Date surveyed	Survey Limitations	Habitat Description	Water Vole Survey Results	Site Photographs	Further surveys proposed?
			the channel is also partially shaded by an adjacent hedgerow and there are areas of woodland within close proximity to the watercourse.			
Drain 1	N/A	No survey access (landowner permission not agreed).	N/A	N/A	N/A	N/A – no longer within survey area.
Drain 2	18/09/2019	A section of this ditch is located with a field where no access was permitted by the landowner and therefore this section was not surveyed. However, binoculars were used to confirm that the habitat characteristics were similar to the section which was surveyed.	This comprises a road-side drainage ditch which continues into an adjacent field. The channel was found to be largely dry with pools of shallow water (likely surface run-off) during the 2019 survey. It is shaded by an adjacent field boundary hedgerow. The shallow earth banks comprised managed grassland, and no aquatic species were recorded in the channel.	Likely absent. This ditch is not considered to be suitable to support water vole.	No photograph available.	N/A – no longer within survey area.
Unnamed minor watercourse 5 (MW5)	11/09/2019	Dense scrub vegetation restricted access along short sections of the banks. Where possible, these sections were surveyed using binoculars from safe, accessible locations, and this is therefore not considered to be a significant limitation.	This is a minor watercourse which runs in a northerly direction to join the River Chelt. There is a small farm access bridge which crosses this stream. The stream had low water levels (no obvious flow) at the time of the 2019 survey. The channel is heavily shaded by adjacent scrub vegetation and trees with no aquatic vegetation recorded and sparse vegetation on the earth banks (which are steeply sloping).	Likely absent. This watercourse is not considered to be suitable to support water vole.		No further surveys proposed.
Drain 3	17/09/2019	N/A	This comprises a road-side drainage ditch which was found to be largely dry with pools of shallow water (likely surface run-off) during the 2019 survey. Poor water quality (pollution) was noted. It is shaded by an adjacent field boundary hedgerow. The shallow earth banks and the channel are vegetated with grasses and tall ruderal species including nettles, with no aquatic species recorded.	Likely absent. This ditch is not considered to be suitable to support water vole.		No further surveys proposed.
Drain 4	17/09/2019	N/A	This is located within a grassland field (pasture), however, no ground depression, standing water or aquatic species were found at this location.	Likely absent. This ditch is not considered to be suitable to support water vole.	No photograph available.	No further surveys proposed.
Drain 5	02/09/2019	N/A	This comprises a ditch with very shallow earth banks which runs beneath a hedgerow at the boundary of agricultural fields (pasture and arable). The ditch was	Likely absent.	No photograph available.	No further surveys proposed.






Habitat Feature	Date surveyed	Survey Limitations	Habitat Description	Water Vole Survey Results	Site Photographs	Further surveys proposed?
			completely dry during the 2019 survey. The channel is heavily shaded and there is sparse vegetation on the banks, with no aquatic vegetation recorded.	This ditch is not considered to be suitable to support water vole.		
Drain 6	02/09/2019	N/A	This comprises a ditch with shallow earth banks which runs alongside a hedgerow at the boundary of agricultural fields (pasture). The ditch was completely dry during the 2019 survey. The channel is shaded and there is sparse vegetation on the banks, with no aquatic vegetation recorded.	Likely absent. This ditch is not considered to be suitable to support water vole.	No photograph available.	No further surveys proposed.
Drain 7	02/09/2019	N/A	This is located within a grassland field (pasture), however, no ground depression, standing water or aquatic species were found at this location.	Likely absent. This ditch is not considered to be suitable to support water vole.	No photograph available.	No further surveys proposed.
Drain 8	06/09/2019	N/A	This comprises a ditch at the bottom of a wooded embankment between the A4019 and a minor road. There was shallow water present within the ditch during the 2019 survey, although poor water quality (pollution) was noted. The channel is heavily shaded resulting in sparse vegetation on the banks. Vegetation recorded within the channel includes watercress and nettles.	Likely absent. This ditch is not considered to be suitable to support water vole.		No further surveys proposed.
Drain 9	06/09/2019	N/A	This comprises a road-side drainage ditch which was found to be completely dry during the 2019 survey. It is shaded by an adjacent field boundary hedgerow and trees. The road-side earth bank is steep and vegetated with grasses and tall ruderal species including nettles, cow parsley, and willowherb.	Likely absent. This ditch is not considered to be suitable to support water vole.		No further surveys proposed.
Drain 10	23/07/2019 (north of A4019) 05/09/2019 (south of A4019)	Dense scrub vegetation restricted access along the banks of the ditch to the north of the A4019.	This comprises a road-side drainage ditch which is culverted beneath the A4019 (however, this culvert was not found during the survey). To the south of the A4019, the ditch is also culverted beneath the minor roads Withybridge Lane and Withybridge Gardens. The ditch had shallow patches of standing water during the 2019 survey. Very poor water quality was noted and there is a large amount of dumped material within the channel, particularly where the ditch runs adjacent to a parking lay-by. The earth banks are shallow and heavily shaded along the majority of the channel by adjacent hedgerows and trees. There are dense patches of tall ruderal species growing on the banks including nettles and willowherb, although no aquatic species were recorded in the channel.	Likely absent. This ditch is not considered to be suitable to support water vole.		No further surveys proposed.





Habitat Feature	Date surveyed	Survey Limitations	Habitat Description	Water Vole Survey Results	Site Photographs	Further surveys proposed?
			To the north of the A4019, the ditch runs alongside a section of the m5 and the M5 J10 southbound off-slip road. There is dense scrub and trees along the banks of the ditch, resulting in heavy shading. The ditch continues north (parallel to the M5) and joins Leigh Brook at the location where this watercourse flows beneath the M5.			
Drain 11	05/09/2019	N/A	This comprises a road-side drainage ditch which was found to be completely dry during the 2019 survey. It is shaded by an adjacent field boundary hedgerow. The shallow earth banks and channel are vegetated with grasses and tall ruderal species including nettles and no aquatic species were recorded.	Likely absent. This ditch is not considered to be suitable to support water vole.	No photograph available.	No further surveys proposed.
Drain 12	18/09/2019	N/A	This comprises a ditch with shallow earth banks which runs alongside a hedgerow at the boundary of agricultural fields (pasture). The ditch was completely dry during the 2019 survey. The channel is shaded and there is sparse vegetation on the banks, with no aquatic vegetation recorded.	Likely absent. This ditch is not considered to be suitable to support water vole.	No photograph available.	No further surveys proposed.
Drain 13	04/11/2019	N/A	This comprises a ditch which runs along the boundary of two open grassland fields (pasture) and alongside the back of residential houses/gardens. The channel has shallow earth banks and there was shallow water present during the 2019 survey. The channel is partially shaded by adjacent trees and scrub, resulting in sparse vegetation on the bank and no aquatic vegetation was noted within the channel.	Likely absent. This ditch is not considered to be suitable to support water vole.	 	No further surveys proposed.
Drain 13a	11/09/2019	N/A	This comprises a ditch with shallow earth banks which runs alongside a hedgerow at the boundary of agricultural fields (arable). The ditch was completely dry during the 2019 survey. The channel is shaded and there is sparse vegetation on the banks, with no aquatic vegetation recorded.	Likely absent. This ditch is not considered to be suitable to support water vole.		No further surveys proposed.





Habitat Feature	Date surveyed	Survey Limitations	Habitat Description	Water Vole Survey Results	Site Photographs	Further surveys proposed?
Drain 14	09/09/2019	N/A	This comprises a road-side drainage ditch which runs alongside Hayden Lane, beneath the B4634 road and continues north alongside Withybridge Lane. The ditch was found to be completely dry during the 2019 survey. It is shaded by adjacent field boundary hedgerows. The shallow earth banks and channel are vegetated with grasses and tall ruderal species including nettles and no aquatic species were recorded.	Likely absent. This ditch is not considered to be suitable to support water vole.	No photograph available.	No further surveys proposed.
Drain 15	18/09/2019 19/09/2019	N/A	This comprises a ditch with very shallow earth banks which runs alongside Hayden Lane, beneath a hedgerow at the boundary of an arable field, beneath the B4634 (culverted) and north beneath a hedgerow at the boundary of agricultural fields (pasture). The ditch has very shallow earth banks and it was completely dry during the 2019 survey. The channel is heavily shaded and there is sparse vegetation on the banks, with no aquatic vegetation recorded.	Likely absent. This ditch is not considered to be suitable to support water vole.	 	No further surveys proposed.
Drain 16	18/09/2019	N/A	This comprises a road-side drainage ditch which was found to be completely dry during the 2019 survey. It is shaded by an adjacent field boundary hedgerow. The road-side earth bank is vegetated with grasses and tall ruderal species including nettles, with no aquatic vegetation recorded.	Likely absent. This ditch is not considered to be suitable to support water vole.		No further surveys proposed.





Habitat Feature	Date surveyed	Survey Limitations	Habitat Description	Water Vole Survey Results	Site Photographs	Further surveys proposed?
Drain 17	18/09/2019	N/A	This comprises a road-side drainage ditch which was found to be completely dry during the 2019 survey. It is shaded by an adjacent field boundary hedgerow. The road-side earth bank is steep and vegetated with grasses and tall ruderal species including nettles, thistles, and cow parsley, with no aquatic vegetation recorded.	Likely absent. This ditch is not considered to be suitable to support water vole.		No further surveys proposed.
Drain 19	18/09/2019	N/A	This comprises a road-side drainage ditch which was found to be completely dry during the 2019 survey. It is shaded by an adjacent field boundary hedgerow and trees. The road-side earth bank is steep and vegetated with grasses and tall ruderal species including nettles, with no aquatic vegetation recorded.	Likely absent. This ditch is not considered to be suitable to support water vole.		No further surveys proposed.
Drain 20	18/09/2019	N/A	This comprises a ditch with very shallow earth banks which runs beneath a hedgerow at the boundary of agricultural fields (pasture and arable). The ditch was completely dry during the 2019 survey. The channel is heavily shaded and there is sparse vegetation on the banks, with no aquatic vegetation recorded.	Likely absent. This ditch is not considered to be suitable to support water vole.	No photograph available.	No further surveys proposed.
Drain 21	30/03/2021	N/A	This comprises a ditch with very shallow earth banks which runs beneath a hedgerow at the boundary of agricultural fields (pasture). The ditch was almost dry with patches of shallow standing water. The channel is heavily shaded and there is sparse vegetation on the banks, with no aquatic vegetation recorded.	Likely absent. This ditch is not considered to be suitable to support water vole.		No further surveys proposed.

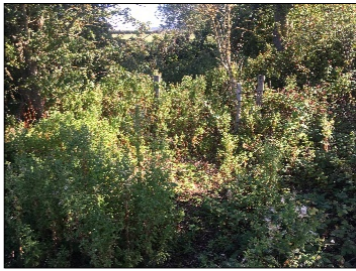


Habitat Feature	Date surveyed	Survey Limitations	Habitat Description	Water Vole Survey Results	Site Photographs	Further surveys proposed?
Drain 22 (Piffs Elm)	28/07/2021	No survey access to ditch on eastern side of M5 (landowner permission not agreed)	<p>This comprises a ditch which passes beneath the M5 through a corrugated metal culvert just south of Junction 10. On the western side of the M5, the ditch runs parallel to the A4019 before passing through an area of woodland alongside the M5 J10 northbound on-slip. The channel was found to be almost dry with pools of standing water. There is dense duckweed covering the pools of water, however, no other aquatic vegetation was recorded in the channel. The earth banks are steep in places which provide some opportunity for burrow creation. The woodland provides heavy shading and there is limited suitable vegetation on the banks to provide foraging habitat for water vole. The ditch has connectivity to Drain 9 which was assessed as providing poor habitat for water vole and has been scoped out of further assessments.</p> <p>There was no permitted access to survey Piffs Elm to the east of the M5. The ditch does not appear on OS mapping, however, from a review of online mapping and aerial imagery, the ditch likely continues through an area of woodland and residential gardens. The ditch also does not appear to be connected to other suitable habitat for water vole. Drain 10 and Drain 11 are located in close proximity to the likely route of Piffs Elm ditch on the eastern side of the M5, however, these ditches were assessed as providing poor habitat for water vole and have been scoped out of further assessments.</p>	<p>Likely absent.</p> <p>This ditch is not considered to be suitable to support water vole.</p>		No further surveys proposed.
Pond 1	N/A	No survey access (landowner permission not agreed)	N/A	N/A	N/A	N/A – no longer within survey area.
Pond 2	N/A	No survey access (landowner permission not agreed)	N/A	N/A	N/A	N/A – no longer within survey area.
Pond 3	N/A	No survey access (landowner permission not agreed)	N/A	N/A	N/A	N/A – no longer within survey area.
Pond 4	N/A	No survey access (landowner permission not agreed)	N/A	N/A	N/A	N/A – no longer within survey area.
Pond 5	N/A	No survey access (landowner permission not agreed)	N/A	N/A	N/A	N/A – no longer within survey area.
Pond 6	N/A	No survey access (landowner permission not agreed)	N/A	N/A	N/A	N/A – no longer within survey area.

Habitat Feature	Date surveyed	Survey Limitations	Habitat Description	Water Vole Survey Results	Site Photographs	Further surveys proposed?
Pond 7	06/09/2019	Access around the banks of this pond was restricted by dense bankside scrub, however, binoculars were used to aid the survey.	This pond is located at the edge of a grassland field (pasture) and adjacent to a residential house and garden. The pond has shallow earth banks, and it is heavily shaded by adjacent scrub vegetation and willow trees. There is a lack of aquatic vegetation.	Likely absent. This pond is not considered to be suitable to support water vole.		N/A – no longer within survey area.
Pond 8	04/11/2019	N/A	This pond is located within an open grassland field (pasture). The earth banks are very shallow. There is duckweed within the pond but otherwise there is a lack of vegetation within the pond and on the banks.	Likely absent. This pond is not considered to be suitable to support water vole.		N/A – no longer within survey area.
Pond 9	04/11/2019	Access around the banks of this pond was restricted by the adjacent wall, however, binoculars were used to aid the survey.	This pond is located within a residential garden. The pond is partly surrounded by a brick wall and there are shallow areas of earth bank. The pond is partially shaded by adjacent trees and scrub. There is extensive duckweed within the pond, alongside small patches of yellow flag iris.	Likely absent. This pond is not considered to be suitable to support water vole.		N/A – no longer within survey area.
Pond 10	06/09/2019	Access around the banks of this pond was restricted by dense bankside scrub and a barbed-wire fence, however, binoculars were used to aid the survey.	This comprises a large waterbody at the corner of agricultural fields (arable). There is dense bramble scrub and trees around the edge of the pond, resulting in partial shading. There are patches of bulrush within the pond. The banks of the pond were not visible due to the bankside vegetation.	Possible presence (surveys incomplete). It was not possible to access the banks of this pond to complete a sufficient survey.		N/A – no longer within survey area.
Pond 11	02/09/2019	N/A	This pond comprises a shallow ground depression which was completely dry at the time of the 2019 survey. The pond is heavily shaded by adjacent scrub and trees, and no aquatic species were present within the pond. Adjacent land use comprises open grassland fields (pasture).	Likely absent. This pond is not considered to be suitable to support water vole.		N/A – no longer within survey area.

Habitat Feature	Date surveyed	Survey Limitations	Habitat Description	Water Vole Survey Results	Site Photographs	Further surveys proposed?
Pond 12	02/09/2019	N/A	This pond comprises a shallow ground depression which had shallow water present during the 2019 survey. The pond is heavily shaded by adjacent scrub and trees, and no aquatic species were present within the pond. Adjacent land use comprises open grassland fields (pasture).	Likely absent. This pond is not considered to be suitable to support water vole.		No further surveys proposed.
Pond 13	02/09/2019	N/A	This pond comprises a shallow ground depression which was completely dry at the time of the 2019 survey. The pond is heavily shaded by adjacent scrub and trees, and no aquatic species were present within the pond. Adjacent land use comprises open grassland fields (pasture).	Likely absent. This pond is not considered to be suitable to support water vole.		No further surveys proposed.
Pond 14	02/09/2019	N/A	This pond comprises a shallow ground depression which was completely dry at the time of the 2019 survey. The pond is heavily shaded by adjacent trees, and no aquatic species were present within the pond. Adjacent land use comprises open grassland fields (pasture).	Likely absent. This pond is not considered to be suitable to support water vole.		No further surveys proposed.
Pond 14a	02/09/2019	N/A	This pond comprises a shallow ground depression which had shallow water present during the 2019 survey. The pond is heavily shaded by adjacent scrub and trees, and no aquatic species were present within the pond. Adjacent land use comprises open grassland fields (pasture).	Likely absent. This pond is not considered to be suitable to support water vole.		No further surveys proposed.

Habitat Feature	Date surveyed	Survey Limitations	Habitat Description	Water Vole Survey Results	Site Photographs	Further surveys proposed?
Pond 15	02/09/2019	N/A	This pond comprises a shallow ground depression within an open grassland field (pasture) which was completely dry at the time of the 2019 survey. The pond is partially shaded by an adjacent hedgerow, and no aquatic species were present within the pond.	Likely absent. This pond is not considered to be suitable to support water vole.		No further surveys proposed.
Pond 16	02/09/2019	N/A	This pond comprises a shallow ground depression which had shallow water present during the 2019 survey. The pond is heavily shaded by adjacent scrub and trees, and no aquatic species were present within the pond. Adjacent land use comprises open grassland fields (pasture).	Likely absent. This pond is not considered to be suitable to support water vole.		No further surveys proposed.
Pond 17	02/09/2019	Access around a section of the banks of this pond was restricted by dense bankside scrub, however, binoculars were used to aid the survey.	This pond is located at the corner of an open grassland field (pasture). There is dense bramble scrub around approximately 50% of the pond edge. The scrub and adjacent trees result in partial shading of the pond. There are patches of common reed within the pond. The earth banks are mostly shallow, although some sections of the banks are not visible due to the dense bankside vegetation.	Likely absent. This pond is not considered to be suitable to support water vole.		No further surveys proposed.
Pond 17a	02/09/2019	N/A	This pond is located within the corner of an open rough grassland field. The earth banks are tall although shallow-sloping and vegetated with grasses and scattered scrub/trees, which results in partial shading of the pond. There is extensive duckweed within the pond with a lack of other aquatic vegetation.	Likely absent. This pond is not considered to be suitable to support water vole.		No further surveys proposed.
Pond 18	N/A	No survey access (landowner permission not agreed).	N/A	N/A	N/A	No further surveys proposed.
Pond 19	N/A	No survey access (landowner permission not agreed).	N/A	N/A	N/A	No further surveys proposed.
Pond 20	N/A	No survey access (landowner permission not agreed).	N/A	N/A	N/A	N/A – no longer within survey area.

Habitat Feature	Date surveyed	Survey Limitations	Habitat Description	Water Vole Survey Results	Site Photographs	Further surveys proposed?
Pond 21	06/09/2019	Access around the banks of this pond was restricted by dense bankside scrub, however, binoculars were used to aid the survey.	This pond is located at the corner of open grassland fields (pasture) and there was shallow water present during the 2019 survey. The pond is heavily shaded by adjacent scrub and trees, and no aquatic species were present within the pond. The earth banks are shallow.	Likely absent. This pond is not considered to be suitable to support water vole.		N/A – no longer within survey area.
Pond 22	04/11/2019	Access around the banks of this pond was restricted by dense bankside scrub, however, binoculars were used to aid the survey.	This pond is located at the border between open grassland fields (pasture) and residential housing/gardens. The banks of this pond are densely vegetated with bramble scrub and trees resulting in heavy shading. There is extensive duckweed within the pond with a lack of other aquatic vegetation. The banks were mostly not visible due to the dense bramble.	Likely absent. This pond is not considered to be suitable to support water vole.		No further surveys proposed.
Pond 23	04/11/2019	Access around the banks of this pond was restricted by dense bankside scrub, however, binoculars were used to aid the survey.	This pond is located at the border between open grassland fields (pasture) and residential housing/gardens. The earth banks are shallow and bankside trees and scrub vegetation results in partial shading of the pond. There is a high coverage of duckweed within this pond and a lack of other aquatic species.	Likely absent. This pond is not considered to be suitable to support water vole.		No further surveys proposed.
Pond 24	04/11/2019	Access around the banks of this pond was restricted by fencing, however, binoculars were used to aid the survey from adjacent land.	This is a large pond located at the corner of open grassland fields (pasture) and residential housing/gardens. The earth banks are very shallow sloping. There are trees and scrub vegetation on the banks resulting in sparse vegetation on the banks. There is a high coverage of duckweed within this pond and a lack of other aquatic species.	Likely absent. This pond is not considered to be suitable to support water vole.		No further surveys proposed.
Pond 25	N/A	No survey access (landowner permission not agreed).	N/A	N/A	N/A	No further surveys proposed.

Habitat Feature	Date surveyed	Survey Limitations	Habitat Description	Water Vole Survey Results	Site Photographs	Further surveys proposed?
Pond 26	18/09/2019	N/A	This pond comprises a shallow ground depression adjacent to a hedgerow and area of dense scrub adjacent to open grassland fields. The pond was completely dry at the time of the 2019 survey. The pond is heavily shaded, and no aquatic species were present within the pond.	Likely absent. This pond is not considered to be suitable to support water vole.		No further surveys proposed.
Pond 27	18/09/2019	N/A	This pond comprises a shallow ground depression within an area of dense scrub adjacent to open grassland fields. The pond was completely dry at the time of the 2019 survey. The pond is heavily shaded, and no aquatic species were present within the pond.	Likely absent. This pond is not considered to be suitable to support water vole.	No photograph available.	No further surveys proposed.
Pond 28	N/A	No survey access (landowner permission not agreed).	N/A	N/A	N/A	No further surveys proposed.
Pond 29	N/A	No survey access (landowner permission not agreed).	N/A	N/A	N/A	No further surveys proposed.
Pond 30	18/09/2019	Access around the banks of this pond was restricted by dense bankside scrub.	This pond was found to be surrounded and covered by dense bramble scrub and therefore it could not be accessed to survey. However, it is assumed that the pond has sparse vegetation due to the heavy shading.	Likely absent. This pond is not considered to be suitable to support water vole.		No further surveys proposed.
Pond 31	09/09/2019	N/A	This pond comprises a shallow ground depression within an open grassland field (pasture) which was completely dry at the time of the 2019 survey. The pond is partially shaded by an adjacent bramble scrub and no aquatic species were present within the pond.	Likely absent. This pond is not considered to be suitable to support water vole.		No further surveys proposed.
Pond 39	N/A	No survey access (landowner permission not agreed).	N/A	N/A	N/A	No further surveys proposed.

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