River Coln at Fairford

Water Vole Monitoring Survey

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This report has been prepared on behalf of:

Farming and Wildlife Advisory Group (FWAG) South West

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1. Introduction

1.1 This report has been prepared by Mike Dean of MD Ecology Limited for the Farming and Wildlife Advisory Group (FWAG) South West. It provides the results of a water vole (*Arvicola amphibius*) monitoring survey of a stretch of the River Coln downstream of Fairford, hereafter referred to as 'the site' (as shown in Figure 1). The Ordnance Survey grid reference for the centre of the site is SP153005.

1.2 Works to improve the surface of an existing footpath along the river bank within the site were undertaken in spring 2019. Water voles were known to be present in the banks of the river throughout the site, and works were therefore undertaken under a Natural England Conservation Licence (2019-38748-SCI-SCI). This included:

- Displacement of water voles from two locations on the left bank of the river, where there was a high likelihood of burrows being present and affected by the proposed works, followed by restoration of the habitat where necessary post-completion of the works;
- An ecological watching brief during the works to ensure minimal impact on the riverbank, specifically in locations likely to support water voles;
- Habitat improvement works to the banks of the river in specific locations within the site (completed immediately following completion of the path works); and
- Habitat improvement works on a side branch of the river, through pollarding / removal of large willows (undertaken by the Gloucestershire Wildlife Trust in 2021).

1.3 The Natural England Licence includes a requirement for monitoring following completion of the works. The monitoring surveys are to be undertaken on a single visit in September in each of 2019, 2020 and 2021. On each visit, a field sign survey is to be undertaken of the entire length of watercourse within the site (approximately 430m length) and on both banks. The survey visits are also to include an assessment of the quality of the habitat within restored areas and areas where habitat improvements works have been undertaken; recommendations for remediation are to be made, if necessary.

1.4 Monitoring survey visits beyond September 2021 are only required if the population appears to have been significantly adversely affected by the works, or if remedial measures are required to the restored habitat, in which case a survey visit in September 2022 will also be required.

1.5 The aims of this report are to set out the methods and results of the 2021 monitoring survey visit, and make recommendations for remedial works as necessary.

1.6 The monitoring survey was undertaken by Mike Dean, the named ecologist on the Natural England Licence and follows current good practice guidelines relating to water vole surveys in development scenarios (Dean, *et al.* 2016).

1.7 Mike Dean is a Fellow member of the Chartered Institute of Ecology and Environmental Management (CIEEM), a Chartered Ecologist and a Chartered Environmentalist. He is the lead author of the current good practice guidelines for surveying for, and mitigating impacts on, water voles in development scenarios (Dean, *et al.* 2016).

2. Survey Methods

2.1 The length of the River Coln within the site (see Figure 1) was surveyed by Mike Dean on 22nd September 2021. The stretch of the river within the site was divided into sections for the purposes of reporting the monitoring results, as per the sections described in the water vole survey which underpinned the Natural England Licence application (MD Ecology 2018), as shown on Figure 2.

2.2 The survey comprised a search for field signs of water voles (latrines, feeding remains, burrows and footprints) and an assessment of the habitat provided by the banks of the watercourse (in both unaffected sections and in those which had been re-instated) in terms of its suitability for water voles. The number of latrines was recorded within each section to allow an assessment of the relative population density, based on paragraph 3.3.16 of the Water Vole Mitigation Handbook (Dean, *et al.* 2016), and for comparison with surveys undertaken to inform the licence application in 2018 (MD Ecology 2018) and the results of the 2019 and 2020 monitoring (MD Ecology 2019, MD Ecology 2020).

2.3 The survey was undertaken by wading within the channel and included a search of both banks for field signs. The habitat assessment focused on the left bank only (the side of the river on which the path is located). Access was available to the locations where water vole field signs would be most likely to be recorded throughout the majority of the survey area, with the exception of part of Section 8 (see Figure 2) where scouring of the riverbed had deepened the channel resulting in access not being available to survey fully. The approach followed that set out in the Water Vole Mitigation Handbook (Dean, *et al.* 2016).

2.4 Weather conditions during the survey were dry. The water within the channel was clear and relatively shallow, with the exception of parts of Section 8 (see above). The conditions were considered to be good for the survey technique used.

3. Survey Results and Assessment

3.1 Field signs confirming the continued presence of water voles were recorded throughout the site; overall the habitat within the site was considered to be of high quality for water voles, as there was a significant amount of emergent vegetation within the channel, an earth bank for burrowing, and bankside vegetation comprising grasses and a range of weed species.

3.2 During previous surveys the field signs were patchily distributed and tended to be associated with stretches of the river with wide fringes of emergent vegetation (specifically reed sweet-grass (*Glyceria maxima*), yellow flag (*Iris pseudacorus*) and willowherb (*Epilobium* sp.) in drier areas). In 2021, however, water vole field signs were recorded throughout the entire length surveyed. As in previous surveys there was a higher density of field signs in those stretches with wide fringes of emergent vegetation, and a lower density in heavily shaded stretches, as would be expected.

3.3 The number of latrines recorded in 2021 suggested that the population was at 'medium' relative density overall, but clearly varied between 'low' and 'high' relative density in individual sections. This was also the case in 2018, 2019 and 2020.

3.4 The level of water vole activity within the site has increased significantly in comparison with previous surveys, with the number of latrines recorded in 2021 being approximately double that recorded in previous years. The left bank of the river within Section 5 was found to have a particularly high density of water vole latrines, with approximately one latrine per metre of bankside, which is comparable with the highest densities likely to be found anywhere within the UK.

3.5 The areas of restored habitat were generally found to be developing well. Faggoting and coir fibre rolls had been installed in four locations:

1) In Section 3, where water voles were displaced and habitat restoration and habitat improvement works were proposed – the habitat had developed well except where dogs enter the channel, and water voles were present;
2) In Section 4/5, where habitat improvement works were proposed – the habitat had established quickly and water voles were present;
3) In Section 6, where water voles were displaced and habitat restoration was proposed – the habitat had developed well and water voles were present;
4) In Section 11a, where habitat improvement works were proposed – the habitat appeared unlikely to develop fully, due to dogs entering the water.

3.6 No remediation works are considered necessary at any of these locations.

3.7 Otter (*Lutra lutra*) spraint was recorded throughout the site; no field signs of American mink (*Neovison vison*) were recorded.

4. Conclusions and Recommendations

4.1 The works appear to have had little or no discernible impact on the size / relative density of the water vole population present within the site. The availability of habitat is high and increasing, and there appears to have been a significant increase in water vole population size in comparison with that present before works commenced.

4.2 Bankside restoration works have been partially successful and no further benefits are considered likely to be achievable. No remediation works are considered necessary.

4.3 As part of the same project, habitat improvements for water voles within a side branch of the river (on the opposite bank to the path) have been undertaken. These works appear to have been successful in opening up the channel to more light, encouraging the growth of emergent vegetation. Water voles were recorded throughout the side channel in 2021.

4.4 Fencing has been installed, along with signage, to restrict access to the river by people and/or dogs in locations where damage to the banks has occurred, to encourage the regrowth of vegetation in these areas. This appears to have been successful for the most part and should be maintained.

4.5 No further monitoring is considered necessary.

5. References

Dean, M., Strachan, R. Gow, D and Andrews, R. (2016) *The Water Vole Mitigation Handbook (Mammal Society Mitigation Guidance Series).* Eds Fiona Mathews and Paul Chanin. Mammal Society, London.

MD Ecology (2018). *River Coln at Fairford: Water Vole Survey and Mitigation Strategy.* Report reference C122/R2/v1.

MD Ecology (2019). *River Coln at Fairford: Water Vole Monitoring Survey.* Report reference C122/MR19/v1.

MD Ecology (2020). *River Coln at Fairford: Water Vole Monitoring Survey.* Report reference C122/MR20/v1.

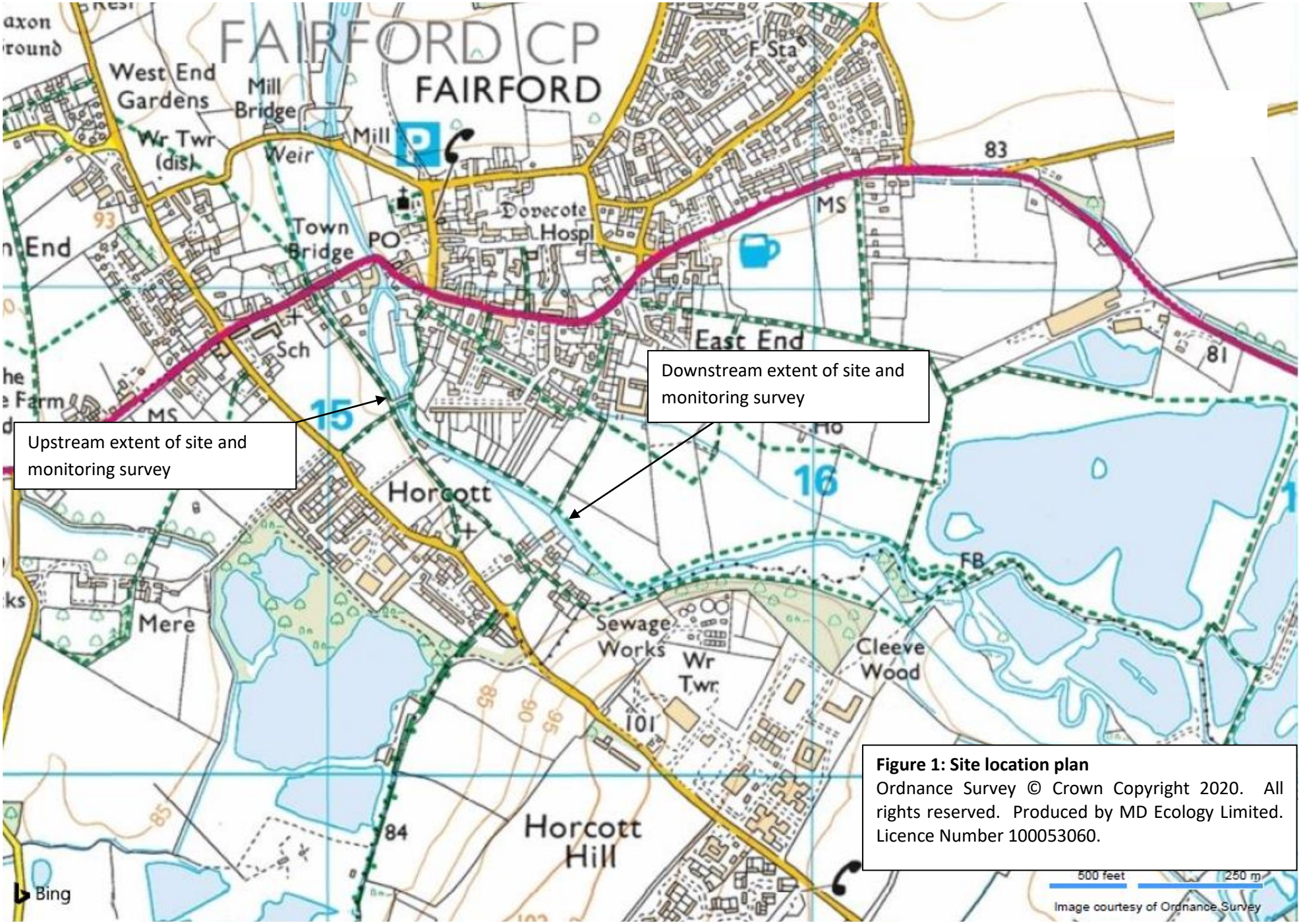

Figure 1: Site location plan

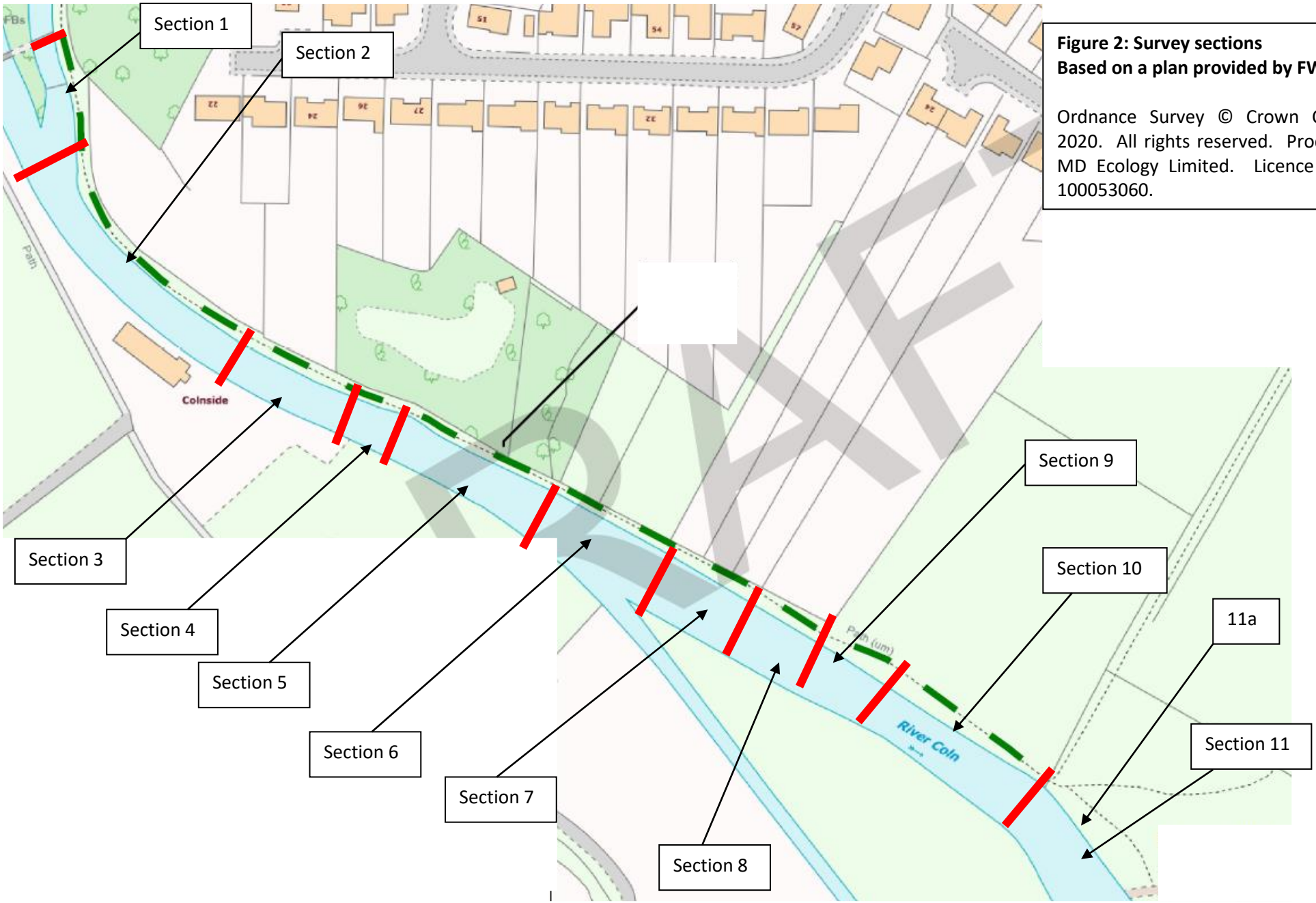

Figure 2: Survey sections
Based on a plan provided by FWAG

Appendix 1: Survey results

Section	Approx. length	Works undertaken to bank face (left bank)	Number of latrines recorded								Description of habitat (Left bank) in 2021	Description of habitat (Left bank) in 2018	Comparison of 2021 status with pre-works (2018)
			2021		2020		2019		2018				
			L	R	L	R	L	R	L	R			
1	50m	None	3	4	3	2	1	2	0	3	Good habitat, with a significant amount of emergent vegetation present	Good habitat, with a significant amount of emergent vegetation present	Increase in relative density of water voles
2	60m	None	13	6	6	0	14	0	3	0	Good habitat with emergent vegetation present; significantly better habitat than was the case in 2018	Relatively poor bankside vegetation with limited emergent vegetation present.	Increase in relative density of water voles
3	30m	Displacement and subsequent restoration of bank using faggots and coir fibre rolls	7	4	0	0	1	3	0	0	Habitat is developing well with a dense fringe of reed sweet-grass.	Relatively poor bankside vegetation due to shading from bankside trees.	Increase in relative density of water voles

Section	Approx. length	Works undertaken to bank face (left bank)	Number of latrines recorded								Description of habitat (Left bank) in 2021	Description of habitat (Left bank) in 2018	Comparison of 2021 status with pre-works (2018)
			2021		2020		2019		2018				
			L	R	L	R	L	R	L	R			
4	20m	Displacement; no restoration needed	0	4	2	4	2	4	1	0	Good habitat, with a wide fringe of emergent vegetation dominated by yellow flag. There is a small area of habitat degradation where dogs enter/exit the river	Good habitat, with a wide fringe of emergent vegetation dominated by yellow flag.	Increase in relative density of water voles
4 / 5	9m	Habitat improvement works (as proposed in the licence application)	5	-	2	-	2	-	0	-	Vegetation has established well within the coir fibre roll; improved habitat as a result	Section of bank which has been washed away and repaired with faggots – further bank stabilisation work may be needed.	Increase in relative density of water voles
5	45m	None	38	12	14	7	10	7	10	5	Good habitat, with a very wide fringe (5m) of emergent vegetation dominated by reed sweet-grass.	Good habitat, with a very wide fringe (5m) of emergent vegetation dominated by reed sweet-grass.	Significant increase in relative density of water voles

Section	Approx. length	Works undertaken to bank face (left bank)	Number of latrines recorded								Description of habitat (Left bank) in 2021	Description of habitat (Left bank) in 2018	Comparison of 2021 status with pre-works (2018)
			2021		2020		2019		2018				
			L	R	L	R	L	R	L	R			
6	30-40m	Displacement and subsequent restoration of bank using faggots and coir fibre rolls	3	6	4	0	0	0	3	0	Habitat has developed well, with a narrow fringe of emergent vegetation now present in front of the undercut banks which provide good burrowing opportunities.	Good habitat, with a wide fringe of emergent vegetation dominated by reed sweet-grass, and bankside vegetation dominated by willowherb and nettles.	Increase in relative density of water voles
7	30m	None	5	0	2	0	4	0	1	0	Habitat recovering naturally, dominated by ruderal species but some emergent vegetation present	Poor habitat with emergent vegetation only present in occasional patches. Several felled willow pollards in this section (which are likely to have shaded this section pre-2018)	Increase in relative density of water voles

Section	Approx. length	Works undertaken to bank face (left bank)	Number of latrines recorded								Description of habitat (Left bank) in 2021	Description of habitat (Left bank) in 2018	Comparison of 2021 status with pre-works (2018)
			2021		2020		2019		2018				
			L	R	L	R	L	R	L	R			
8	20m	None	3	4	-	-	0	5	20	4	The habitat was considered to be very good (similar to 2018) with a wide fringe of emergent vegetation.	Good habitat, with a wide fringe of emergent vegetation dominated by yellow flag and reed sweet-grass.	Decrease in relative density of water voles. Could not access fully due to depth of water
9	15m	None	4	4	3	4	2	4	6	6	Good habitat, with a wide fringe of emergent vegetation dominated by reed sweet-grass and willowherb.	Good habitat, with a wide fringe of emergent vegetation dominated by reed sweet-grass and willowherb.	Decrease in relative density of water voles
10	60m	None	0	3	0	0	0	1	0	1	Poor habitat as heavily shaded by bankside trees; patches of emergent vegetation in places.	Poor habitat as heavily shaded by bankside trees; patches of emergent vegetation in places.	Increase in relative density of water voles
11	30m	None	8	3	2	4	3	1	0	0	Habitat has developed well and is improved since previous surveys.	Poor habitat in general as the bank is undercut and lacks emergent vegetation.	Increase in relative density of water voles

Section	Approx. length	Works undertaken to bank face (left bank)	Number of latrines recorded								Description of habitat (Left bank) in 2021	Description of habitat (Left bank) in 2018	Comparison of 2021 status with pre-works (2018)
			2021		2020		2019		2018				
			L	R	L	R	L	R	L	R			
11a	3m	Habitat improvement works (as proposed in the licence application)	0	0	0	0	0	0	0	0	Habitat is recovering	Eroded section of bank, which lacks emergent vegetation.	No change
Total number of latrines (per year)			139		59		66		65				

Appendix 2: Photos (taken September 2021)

Side channel where off-site habitat improvement works have been undertaken

Restored section of bank showing coir fibre roll; vegetation on the roll has established well in some places but not in others

Section 5 of the river – the left bank supports a very high density of water voles