Riverside Energy Park

Environmental Statement Technical Appendices

APPENDIX:

G.4

PLANNING INSPECTORATE REFERENCE NUMBER:

EN010093

DOCUMENT REFERENCE:

WATER VOLE SURVEY REPORT 2018

November 2018 | Revision 0 | APFP Regulation 5(2)(a)

Planning Act 2008 | Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Document Control Sheet

Project Name: **Riverside Energy Park**
Project Ref: **42166**
Report Title: **Water vole Survey**
Doc Ref: **42166/water vole**
Date: **November 2018**

	Name	Position	Signature	Date
Prepared by:	Stephen Foot	Ecologist	Stephen Foot	20/09/18
Reviewed by:	Duncan McLaughlin	Associate Ecologist	Duncan McLaughlin	26/09/18
Approved by:	Dermot Scanlon	Director	Dermot Scanlon	01/10/18
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved

Contents

Appendices

Executive Summary

Peter Brett Associates (PBA) was commissioned to undertake a water vole survey for the Riverside Energy Park (REP) project in Belvedere, London Borough of Bexley. The overall aim of the study was to provide baseline information on the numbers and distribution of water voles within the REP site and local area.

To gather baseline information on the use of watercourses within and adjacent to the REP site and in surrounding areas by water voles, a survey comprising two visits was undertaken by PBA; the first visit was conducted in April 2018 and the second in August 2018. This survey identified the presence of low populations of water voles within the Survey Area with evidence concentrated in watercourses/ditches in the west of the Survey Area.

This Executive Summary contains an overview of the key findings and conclusions. However, no reliance should be placed on any part of the executive summary until the whole of the report has been read.

1 Introduction

1.1 Overview

1.1.1 PBA was commissioned to undertake a water vole survey within and adjacent to the Riverside Energy Park (REP) site situated adjacent to the southern bank of the River Thames in Belvedere, London Borough of Bexley. The overall aim of this survey was to provide baseline information on the presence/likely absence, population size and distribution of water voles within the Survey Area, which included: the REP site, the Main Temporary Construction Compound adjacent to Norman Way, and the Electrical Connection Route option through Crossness Local Nature Reserve (LNR).

1.1.2 This information will help to provide baseline information required to inform an Environmental Impact Assessment for REP, as well as to provide a basis for appropriate mitigation of potential impacts associated with the Proposed Development.

1.1.3 A full description of REP can be found in **Chapter 3** of the Environmental Statement (**Document Reference 6.1**), and in **Schedule 1** to the draft Development Consent Order (**Document Reference 3.1**).

1.1.4 A full description of habitats within the Survey Area can be found in **Chapter 11** of the Environmental Statement.

1.2 Ecological Background

1.2.1 An extended Phase 1 habitat survey undertaken by PBA in autumn 2017 identified habitat capable of providing a foraging and sheltering resource for water voles both within the REP site and in surrounding areas (PBA, 2018).

1.2.2 A large pollution incident occurred in Spring 2018 from the adjacent Thames Water owned Crossness Sewage Treatment Works. This spillage contaminated the adjacent Crossness LNR. In addition to the reserve, the pollution event also affected the adjacent footpath and part of the Great Breach Dyke West and Horsehead Dyke (Ditch 2, see Section 3). As part of the clean-up by Thames Water, water voles were trapped from the LNR and a section of Ditch 2. This resulted in 62 animals being trapped and removed, which were held in captivity with a view to re-releasing them in Spring 2019 once the area has been restored (pers. comm. Thames Water Biodiversity Team Leader).

1.3 Report Objectives/Aims

1.3.1 The aim of this report is to:

- Provide details of the methods used for the study;
- Provide the results of the water vole survey undertaken in April and August 2018;
- Interpret the results of the survey in relation to the proposed development of REP, including information on approximate population sizes and distribution patterns; and
- Provide an evaluation of the water vole population recorded in the context of national and international trends and local records.

2 Methods

2.1.1 The survey area and methods employed to determine the likely presence/likely absence of water voles are detailed below.

2.2 Survey Area

2.2.1 The Survey Area comprised ditches and watercourses on the REP site and adjacent areas. This included:

- the ditch and SUDs (Sustainable Urban Drainage) area within the REP site;
- ditches along the bridleway adjacent to the Crossness Local Nature Reserve (LNR) (which may be used as part of an associated Electrical Connection Route); and
- ditches adjacent to Norman Road to the south of the REP site adjacent to areas proposed to be used as the Main Temporary Construction Compound.

2.3 Water Vole Survey

2.3.1 As per current guidance (Dean, et. al. 2016), two survey visits were undertaken; the first being in the spring and the second being in the late summer of 2018. Each of the surveys involved the vegetation on the bank edges of these watercourses being thoroughly searched for field signs indicating the presence of water voles. Field signs were also searched for up to 1m out into the water and at least 1m up the bank. Signs indicating water vole presence included feeding remains, characteristic grass lawns, burrows, runs, footprints, latrines and water vole droppings.

2.3.2 The dates and weather conditions during each survey visit are summarised in Table 1 below.

Table 1: Dates and Weather Conditions of Water Vole Survey Visits

Visit No.	Date	Weather Conditions
1	30/04/18	Overcast (8/8 cloud cover) with heavy rain showers and moderate/strong winds (Beaufort Scale F4). Air temperatures were cool ranging between 6°C and 8°C.
2	13/08/18	Generally dry with occasional light rain showers and partially cloudy skies (5/8 cloud cover). A moderate breeze was present throughout (Beaufort Scale F2-F3) with air temperatures ranging between 22°C and 24°C.

2.4 Population Size Estimate

2.4.1 The water vole mitigation guidelines state that "*the numbers of latrines recorded during the survey visits will give an indication of relative population size*" (Dean *et,al*, 2016). This information can also be helpful in determining the most value areas of a site for this species. Table 2 below shows relative population sizes based on the numbers of latrines.

Table 2: Water Vole Population Size (Dean *et al*, 2016)

Relative Population Density	Approximate number of latrines per 100m of bankside	
	First half of survey season (mid-April to end of June)	Second half of survey season (July to September)
High	10 or more	20 or more
Medium	3-9	6-19
Low	< 2 (or none, but with other confirmatory field signs)	< 5 (or none, but with other confirmatory field signs)

2.5 Survey Limitations

2.5.1 Access to the southern extent (c. 200m length) of Ditch 2 was not possible during either of the visits due to marshy/unsafe ground conditions. Similarly, full access to Ditches 1 and 6 was not possible given the presence of fencing in places. Dense reed and bramble growth adjacent to ditches (particularly in the August visit) made searching for signs of water voles difficult in some places. However, the majority of ditch banks could be fully accessed and an assessment of water vole presence/population size could be made. Where appropriate these factors have been taken into consideration when determining the presence/population size of animals present.

2.6 Survey Personnel

2.6.1 The surveys were undertaken by Ed Austin MCIEEM and Stephen Foot MCIEEM.

2.6.2 Ed has worked as a professional ecologist since 2004 and has undertaken numerous surveys for water voles throughout the UK. Ed has also worked as an accredited agent on a licence to trap and translocate water voles for the purposes of development and water vole conservation.

2.6.3 Stephen has works as a professional ecologist since 2005 and during this time has undertaken numerous surveys for water voles throughout the UK as well as being involved in mitigation and translocation programmes for this species.

2.7 Method and Report Qualification

2.7.1 All survey work and reporting was undertaken by experienced and qualified ecologists (see above), in accordance with the Code of Professional Conduct of the Chartered Institute of Ecology and Environmental Management (CIEEM).

2.7.2 All ecological surveys have an expected validity period owing to the tendency of the natural environment to change over time. This validity period varies from receptor to receptor and is also dependent on the degree of change in a site's management and overall landscape ecology. Where the potential for change is considered to be relevant to the site, this is highlighted in the appropriate section.

2.7.3 This report does not purport to provide detailed, specialist legal advice. Where legislation is referenced, the reader should consult the original legal text, and/or the advice of a qualified environmental lawyer.

3 Results and Interpretation

3.1 Watercourse Descriptions

3.1.1 Descriptions of each of the watercourses surveyed are provided below. The locations of these watercourses are provided on **Figure 11.7** with photographs provided in **Appendix B** of this report.

Ditch 1

3.1.2 This ditch is located adjacent to the yard on the western boundary of the REP site to the north-east of the pumping station. This ditch extends for approximately 340m (of which 150m is accessible) and has a slow flow from the north to the south. This ditch had steep earth banks with a channel width of approximately 3m. The depth of water in the channel was approximately 0.5m throughout its length over a silt-based substrate. The channel was densely vegetated with emergent vegetation (approximately 90% of the channel supported aquatic macrophytes). The adjacent land use comprised grazed pasture with patches of scrub with shading of the ditch by bankside trees being less than 10% of the ditch length.

3.1.3 Conditions of this ditch were similar in the 2nd survey visit in August 2018. Water levels were lower (following prolonged periods of dry weather) with in-channel vegetation cover having become significantly denser since the initial visit.

Ditch 2

3.1.4 Ditch 2 was large ditch/channel leading from the pumping station in the north in a southerly direction adjacent to the bridleway and the Crossness LNR. This ditch was approximately 760m in length (of which 530m had accessible banks with the remainder forming a reed swamp with no discernible bank) with a number of offshoot channels forming branching ditches to the east. The largest of these leads to the east before joining up with a large waterbody.

3.1.5 This watercourse has steep earth banks (becoming shallow toward the southern extent) with a channel width of approximately 8m. The depth of the water is in excess of 1m in places over a silt-based substrate. In-channel vegetation cover was limited to approximately 5-10% of the watercourse with bankside shading also limited to only 10% of the ditch length.

3.1.6 This ditch was noted to be in similar condition on the 2nd survey visit undertaken in August 2018. Reed growth along the margins had proliferated in places, though in-channel cover was largely similar to that recorded in April 2018.

Ditch 3

3.1.7 This ditch was located adjacent to a warehouse building to the west of Norman Road to the south of the REP site. This watercourse is linked to Ditch 4 in its northern extent and joins a large waterbody in the south. The ditch was approximately 250m in length with a channel width of approximately 2m. The earth banks of the ditch were steep with the water depth ranging between 0.2-0.3m. In channel vegetation cover was dense (accounting for 90% coverage of the watercourse) with bankside herbaceous plants (bramble scrub) also being dense along approximately 80% of the ditch length. Shading of the ditch was limited to just 5% of its length.

3.1.8 This ditch was noted to be completely dry during the August survey visit following a period of prolonged dry weather.

Ditch 4

3.1.9 Ditch 4 formed the western and southern boundaries of the southern Borax field. This ditch was approximately 250m with a channel width of 2-2.5m. The ditch had steep earth banks with a shallow water depth of 0.2-0.3m. In channel vegetation was dense (90% coverage) with herbaceous bankside vegetation also providing 80% coverage. No shading from bankside trees was present.

3.1.10 This ditch was noted to be completely dry during the August survey visit following a period of prolonged dry weather.

Ditch 5

3.1.11 This ditch lies along the western and northern boundaries of the northern Borax field to the south of the REP site. This ditch is approximately 200m in length and joins with Ditch 9 to the north. The earth banks of this ditch were steep with the channel width ranging between 1.5 and 2m. The water level in this ditch ranged between 0.2m and 0.5m over a silt-based substrate with in-channel vegetation coverage being approximately 30%. Bankside shading was absent along the length of this watercourse.

3.1.12 The water levels within this ditch had decreased, though conditions remained largely similar during the 2nd survey visit. In channel vegetation along the northern boundary had become denser since the initial survey visit undertaken in April 2018.

Ditch 6

3.1.13 This ditch was located to the south of the carpark (on the southern boundary of the REP site) and flowed in a west-east direction for approximately 285m. This ditch links Ditch 1 in the west. The width if this watercourse was approximately 4m with the depth being 0.5m over a silt-based substrate. The earth banks of the ditch were steep supporting herbaceous planting along 50% of the ditch length. In channel vegetation cover also accounted for 45% of the ditch length. Bankside shading of this watercourse was less than 10%.

3.1.14 This ditch was in similar condition during the August visit to that recorded in April 2018. In channel vegetation (common reed) had increased in density as with many of the other ditches present within the survey area.

Ditch 7

3.1.15 This watercourse was located to the south of the REP site adjacent to Norman Road (adjacent to the western roadside). This ditch was approximately 200m in length and had steep earth banks with a channel width of approximately 2m in width. The water within the channel 0.3-0.5m deep over a silt-based substrate. Bankside herbaceous cover (bramble) was very dense along the entire length of this channel within-channel vegetation also accounting for 95% coverage (common reed). No bankside shading by trees was present.

3.1.16 As above, this ditch was in similar condition during the August visit to that recorded in April 2018. In channel vegetation (common reed) had increased in density as with many of the other ditches present within the survey area.

Ditch 8 and SUDS

3.1.17 This watercourse and waterbody was located to the east of the existing Energy Recovery Facility. This watercourse was approximately 130m in length before forming a small pool at its northern extent. The channel was approximately 2-3m in width with the pool being 4m in width. The earth banks of both the ditch and pool were steep with water levels ranging between 0.5-0.8m over a silt-based substrate. Bankside herbaceous cover was dense with in

channel vegetation also covering approximately 70% of the open water (predominantly consisting of common reed). Shading along the bankside was limited covering just 5% of the ditch length.

3.1.18 This ditch was noted to be dry during the August survey visit with water levels within the pool having significantly decreased in depth (0.1-0.2m). The density of in-channel vegetation had also increased since the April survey visit.

Ditch 9

3.1.19 This ditch was located immediately to the south of the REP site on the western side of Norman Road where it bends to the west. This ditch was approximately 165m in length and linked to Ditch 5 to the south. The earth banks of this ditch were steep, with the channel width being approximately 2m. Water depth was shallow 0.1-0.2m over a silt-based substrate. Bankside herbaceous cover and in-channel vegetation cover were both dense being 100% and 95% respectively. Dense bramble and reed growth lined the dense with dense reed growth in the channel. Some bankside shading was present accounting for 30% of the ditch length.

3.1.20 This ditch was noted to be dry during the August survey visit with in-channel vegetation remaining high at 95-100% coverage.

3.2 Water Vole Survey Results

Visit 1 - April 2018

3.2.1 No water voles were observed during survey visit 1. However, signs of water voles including characteristic feeding remains, runs through vegetation, water vole burrows, water vole droppings and water vole latrines were found throughout the Survey Area. A list of these is provided in **Appendix A** of this report with the locations shown on **Figure 11.7**. Photographs are provided in **Appendix B**. In addition to signs of water voles, a possible water shrew *Neomys fodiens* burrow was noted along with a field vole *Microtus agrestis* foraging along the ditch edge.

Visit 2 – August 2018

3.2.2 Two water voles were observed during Visit 2 with both voles found within bankside vegetation (before entering the watercourse) on Ditch 2. In addition, as before, signs of water voles including characteristic feeding remains, runs through vegetation, water vole burrows, water vole droppings and water vole latrines were found throughout the survey area. A list of these is provided in **Appendix A** with the locations shown on **Figure 11.7**. Photographs are shown in **Appendix B**.

Summary

3.2.3 Table 3 below highlights which of the ditches/watercourses supported signs indicating the presence of water voles.

Table 3: Summary of Water Vole Survey Results

Ditch No.	Water Vole Presence Confirmed (Yes/No)	
	Visit 1	Visit 2
1	Yes	Yes
2	Yes	Yes
3	Yes	No evidence found (ditch dry)

Ditch No.	Water Vole Presence Confirmed (Yes/No)	
	Visit 1	Visit 2
4	Yes	No evidence found (ditch dry)
5	No	No
6	No	No
7	No	No
8 (and SUDs)	No	No
9	No	No

3.2.4 As the results show, water vole presence was confirmed in ditches 1-4 with no signs noted in the other ditches. However, given the interconnectivity of the ditch network within the survey area the presence of water voles is possible in the future within any of the ditches present (albeit in low numbers).

3.3 Site Evaluation and Population Assessment

3.3.1 As detailed in Section 2 of this report, an approximate population size of water voles can be derived using a count of the number of latrines per 100m of bank. The results of this are summarised in Table 4 below.

Table 4: Population sizes of Water vole Populations in Ditches where presence was confirmed

Ditch No.	No. Water Vole Latrines			
	Visit 1	Per 100m	Visit 2	Per 100m
1	3	2	1	0.67
2	7	1.32	12	2.26
3	0	0	0	0
4	1	0.40	0	0

3.3.2 The figures above equate to a low population of animals to be present within ditches 1-4. Ditch 2 supported the highest number of latrines on both visits with a denser distribution of water vole evidence concentrated in the northern extent of the watercourse. It is possible that population sizes within the Survey Area were adversely affected following the pollution of the Crossness LNR which lead to the trapping and translocation of voles from within the reserve/Thames Water site. This would likely have resulted in a decrease in the spread and distribution of animals from the Thames Water site into the Survey Area.

3.3.3 Populations of water voles within the UK have suffered significant declines as a result of habitat loss and the introduction of the American mink *Neovision vision* which is a significant predator to water voles. As such populations of water voles are of a higher conservation significance.

3.4 Legislation Guidance

3.4.1 The water vole and its habitats are protected by the Wildlife and Countryside Act 1981 (as amended).

3.4.2 In addition, water voles are listed as species of principal importance to the conservation of biodiversity in England. This list was drawn up in response to the requirements of section 41 of the Natural Environment and Rural Communities (NERC) Act 2006; it is often referred to as the 'S41 list'. The S41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under the related Section 40 of the NERC Act, to have regard to the conservation of biodiversity in England, when carrying out their normal functions. The presence of a S41 species on site is therefore a material consideration in the planning process (see Appendix C).

4 Conclusion

4.1.1 The water vole surveys confirmed the presence of this species within the Survey Area. The survey results indicate that a low population of water voles is present with the majority of water vole evidence concentrated in watercourses in the west of the Survey Area (within and adjacent to the Crossness LNR).

References

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HMSO (Her Majesty's Stationary Office) (1981). Wildlife and Countryside Act (as amended by the Countryside and Rights of Way Act 2000)

HMSO (2006) Natural Environment and Rural Communities Act.

PBA (2018) Riverside Preliminary Ecological Appraisal

Strachan, Moorhouse and Gelling (2011) Water Vole Conservation Handbook. Wildlife Conservation Research Unit

Appendix A Target Notes

Visit 1 – April 2018

Target Note No.	Type	Number	Location/Habitat	Notes
1	Burrow	2	Bank	Possibly old/disused
2	Feeding Remains	3	in channel	Three areas along ditch bank
3	Feeding Remains	1	in channel	
4	Burrow	1	Bank	
5	Burrow	2	Bank	
6	Feeding Remains	2	in channel	
7	Burrow	1	Bank	
8	Latrine	1	in channel	on mink raft
9	Feeding Remains	1	in channel	
10	Run through vegetation	All along	Bank	along length of bank
11	Latrine	1	Bank	
12	Latrine	1	Bank	
13	Burrow	Numerous	Bank	near pumping station. network visible
14	Latrine	1	Bank	along length of right bank
15	Latrine	1	Bank	
16	Run through vegetation	All along	Bank	
17	Latrine	1	Bank	
18	Lawn	1	Bank	
19	Latrine	1	in channel	on floating boom
20	Burrow	Numerous	Bank	network visible
21	Run through vegetation	Numerous	Bank	
22	Burrow	1	Bank	possibly disused
23	Dropping	1	Bank	
24	Burrow	2	Bank	
25	Latrine	1	Bank	
26	Burrow	1	Bank	marked with cane
27	Dropping	1	Bank	
28	Burrow	1	Bank	likely old
29	Dropping	1	Bank	
30	Feeding Remains	1	Bank	
31	Latrine	1	in channel	on culvert pipe
32	Burrow	1	Bank	Uncertain
33	Run through vegetation	along bank	Bank	
34	Latrine	1	in channel	on box
35	Burrow	1	Bank	
36	Other burrow	1	Bank	Possible water shrew burrow *Neomys fodiens*
37	Live animal	1	Bank	Field vole *Microtus agrestis* foraging along bank of ditch

Target Note No.	Type	Number	Location/Habitat	Notes
38	Run through vegetation	1	Bank	
39	Run through vegetation	1	Bank	

Visit 2 – August 2018

Target Note No.	Type	Number	Location/Habitat	Notes
1	Latrine	1	Bank	
2	Burrow	2	Bank	
3	Feeding Remains	1	Bank	
4	Feeding Remains	1	In-channel	
5	Run Through Vegetation	1	Bank	
6	Run Through Vegetation	1	Bank	
7	Burrow	1	Bank	
8	Burrow	1	Bank	Likely old. seems to contain wasp nest
9	Latrine	1	Bank	Quite high on bank under gamble bush
10	Feeding Remains	1	Bank	
11	Burrow	1	Bank	
12	Run Through Vegetation	1	Bank	
13	Latrine	1	Bank	
14	Run Through Vegetation	1	Bank	
15	Latrine	1	Bank	
16	Dropping	1	Bank	
17	Dropping	1	Bank	
18	Dropping	1	Bank	
19	Latrine	1	Bank	
20	Latrine	1	Bank	
21	Latrine	1	Bank	
22	Dropping	1	Bank	
23	Run Through Vegetation	1	Bank	
24	Feeding Remains	1	Bank	
25	Water vole	1	Bank	Seen briefly diving from bank into channel. Age and sex of animal unknown.
26	Burrow	1	Bank	
27	Latrine	1	Bank	Next to feeding remains
28	Feeding Remains	1	Bank	Very fresh
29	Latrine	1	Bank	
30	Dropping	1	Bank	
31	Latrine	1	Bank	

Target Note No.	Type	Number	Location/Habitat	Notes
32	Run Through Vegetation	1	Bank	
33	Dropping	1	Bank	
34	Dropping	1	Bank	
35	Run Through Vegetation	1	Bank	
36	Latrine	1	Bank	
37	Dropping	1	Bank	
38	Burrow	1	Bank	
39	Latrine	1	Bank	
40	Burrow	1	Bank	More fresh droppings nearby
41	Water vole	1	Bank	Heard diving into channel and movement seen only.
42	Latrine	1	Bank	
43	Run Through Vegetation	1	Bank	
44	Run Through Vegetation	1	Bank	
45	Feeding Remains	1	Bank	
46	Run Through Vegetation	1	Bank	

Appendix B Photographs

Photograph 1: Ditch 1

Photograph 2: Ditch 2

Photograph 3: Ditch 3

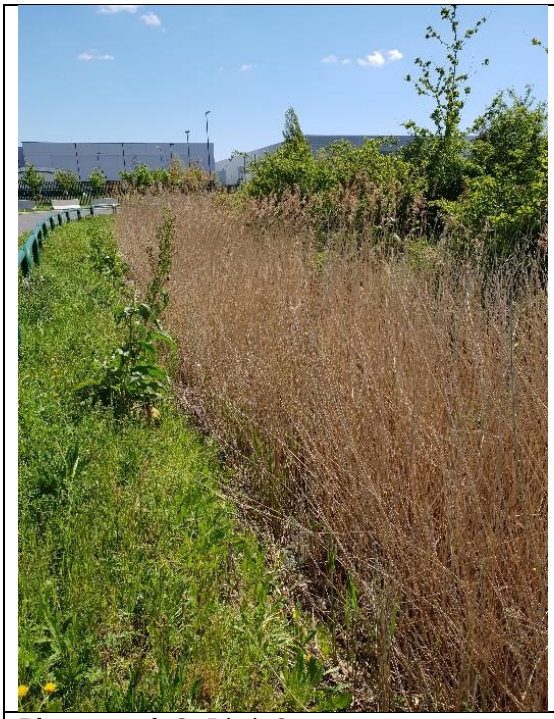
Photograph 4: Ditch 4

Photograph 5: Ditch 5

Photograph 6: Ditch 6

Photograph 7: Ditch 7

Photograph 8: Ditch 8



Photograph 9: Ditch 9

Photograph 10: Feeding remains

Photograph 11: Water vole latrine

Photograph 12: Water vole latrine and feeding remains

Photograph 13: Water vole burrow

Photograph 14: Likely water shrew burrow

Appendix C Relevant Legislation

C.1.1 This section briefly summarises the relevant legislation pertaining to water voles. Please note that the following text does not constitute legal advice.

C.2 The Wildlife and Countryside Act, 1981 (as amended)

C.2.1 The water vole and its habitats are protected by the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to intentionally or recklessly:

- Kill, injure or take water voles;
- Possess or control live or dead water voles;
- Damage, destroy or obstruct access to any shelter or place which water voles uses for shelter or protection; or
- Disturb water voles while they are using such a place.

C.2.2 Although the law provides strict protection to water voles and their burrows, it also allows this protection to be set aside (derogation) through the issuing of licences. The licences in England are currently determined by Natural England (NE).

C.3 The Natural Environment and Rural Communities (NERC) Act, 2006

C.3.1 Water voles across the UK have undergone significant declines in recent years and as a result are now included on the list of species of principal importance prepared in response to Section 41 of the Natural Environment and Rural Communities (NERC) Act, 2006. This legislation placed a duty on the Secretary of State to publish, review and revise lists of living organisms in England that are of principal importance for the purpose of conserving biodiversity. The NERC Act also required the Secretary of State to take, and promote the taking of, steps to further the conservation of the listed organism.