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Land at New Road / Brook Lane, Rustington, West Sussex

Water Vole Survey

May 2015



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Water Vole Survey

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Abbreviations

EPS	European Protected Species
LWS	Local Wildlife Site
NE	Natural England
NERC	Natural Environmental and Rural Communities Act 2006
NPPF	National Planning Policy Framework
SxBRC	Sussex Biodiversity Recording Centre
WCA	Wildlife and Countryside Act

0 Executive Summary

0.1 Introduction

- 0.1.1 A water vole *Arvicola amphibious* survey was carried out for the site of a proposed retail development at Land south of New Road (A259), Rustington in West Sussex (Grid Reference: 505191, 103422).
- 0.1.2 The study was undertaken to establish the presence or likely absence of water vole at the site, identify and evaluate potential impacts of the development on water voles, and make recommendations accordingly. Two surveys were undertaken between 13 April and 7 May 2015 in accordance with current good practice guidelines (Strachan *et al.*, 2011). Surveys were comprised of searches of one bank of the watercourse, including an area at least two meters from the top of the bank, for water voles and their field signs (such as droppings, latrines, feeding stations and footprints).

0.2 Results

- 0.2.1 The desk study (Middlemarch Environmental, 2014) yielded a single record of water vole from within the 1km search area, from 950m north-east of the site recorded in 2011. Water vole could hence be using the riparian habitats within the application site boundary.
- 0.2.2 The majority of the application site is rough semi-improved grassland. There is a small area of woodland in the southern part of the site and a ditch which runs along the southern site boundary.
- 0.2.3 The site provides a 420m section of good quality habitat for water voles, with plentiful cover, abundant food sources and relatively stable water levels. Bank sides are steep with a substrate suitable for burrowing, and there are low levels of site disturbance. No signs indicating the presence of otter *Lutra lutra* or mink *Neovison vison* were noted during the survey.
- 0.2.4 Suitable habitats are also present in adjacent areas, particularly to the north and west, where Black Ditch continues into Rustington Golf Course and the wider countryside, and is associated with a number of large ponds. Black Ditch also continues east into an adjacent construction site which could not be surveyed. Beyond here the watercourse continues east into the urban fringe of Rustington.
- 0.2.5 No water voles were recorded on any of the survey visits to the site. However, a range of field signs were recorded, including latrines, feeding stations and lawns. These confirm that water vole is present within the application site boundaries. It is estimated that at least three breeding females are using the habitats within the application site.

0.3 Evaluation

- 0.3.1 Road widening along Brook Lane and the junction arrangement for the proposed new roundabout to provide access to the site is likely to result in negative impacts in the part of the site which appears more intensively used by water voles. The following direct impacts are predicted, albeit centred on a relatively short stretch of ditch of approximately 20m:
- ▶ Permanent small-scale loss of habitats (including burrows) and temporary habitat fragmentation due to vegetation removal, ground clearance, and engineering works to widen the road and install a new culvert over Black Ditch;
 - ▶ Death or injury to water voles which may be present during the works; and
 - ▶ Disturbance during construction to water voles while occupying a structure or place used for shelter (but not during operation of this retail development proposal).
- 0.3.2 Highways engineers have advised that it will not be possible to avoid these impacts by altering the junction arrangement due to constraints in achieving safe junction geometry and required deceleration / acceleration feeder lanes to the A259.
- 0.3.3 Consequently a mitigation strategy is required to ensure that (a) water voles are not present during the works, and (b) there is no overall loss of suitable habitats. This is likely to focus on displacement of water voles from the construction zone immediately prior to commencement, and subsequent compensation of habitat losses. Mitigation should be implemented in accordance with an agreed Method Statement, which may necessitate a Natural England conservation licence requiring overall conservation benefits to be achieved.

0.4 Recommendations

- 0.4.1 It is recommended that water vole surveys are continued during summer 2015 (to October), both within the application site and adjacent stretches of watercourse, to further investigate the site's importance to the local water vole population
- 0.4.2 For the remainder of the site, impacts will need to be preventing avoided by implementing a fenced buffer zone at least 5m from the top of the bank of Black Ditch. Within the buffer zone construction activities and access by site personnel and machinery should be prohibited and enforced through appropriate fencing and signage.
- 0.4.3 In order to mitigate potential pollution impacts, standard site procedures as recommended by the Environment Agency should be adopted to ensure that no contaminants or effluent (e.g. oil, fuel or chemical spills) are released into aquatic environments during construction.
- 0.4.4 In addition to the above requirements, a range of recommendations are made in relation to the landscape designs for the development and ongoing site management in order to maintain or enhance the value of the site to water voles post-construction.

1 Introduction

1.1 Background

- 1.1.1 A Preliminary Ecological Appraisal was prepared in November 2014 (Middlemarch Environmental, 2014) to inform a planning application for a proposed retail development on a parcel of land south of New Road (A259), Rustington in West Sussex (Grid Reference: 505191, 103422). Droppings were found along both banks of the watercourse on site during the survey, and it was recommended that a water vole *Arvicola amphibius* survey be carried out due to these and the presence of favourable habitats on and adjacent to the site.
- 1.1.2 The Preliminary Ecological Appraisal concluded that the ditch along the southern site boundary, known as Black Ditch, provides suitable habitat for water voles, with good water quality, dense bankside vegetation and numerous aquatic plants. The site is linked to a ditch network which extends into the wider countryside. Rustington Golf Course on the other side of the A259, under which the Black Ditch is culverted, contains numerous large water bodies which may also be suitable for water voles. The proposed development at the site could result in a loss of suitable water vole habitat and a risk of death or injury to individuals if present during construction. The surveys were therefore required to inform a planning application and determine whether the proposals could negatively impact on water voles.

1.2 Objectives of the Study

- 1.2.1 The approach to establishing the ecological baseline found within this report has been achieved through:
- ▶ A desk study involving a review of records of water voles from the local area (1km radius from the centre of the proposed development site);
 - ▶ Information from the Preliminary Ecological Appraisal (carried out by Middlemarch Environmental, 2014) regarding the suitability of habitats present within the site boundary and wider area, and the presence of ecological features important to water voles; and
 - ▶ A presence/absence survey of all suitable habitats on and adjacent to the site, comprising two survey visits following best practice guidelines.
- 1.2.2 The baseline information was then used to fulfil the following objectives:
- ▶ To determine the presence or likely absence of water voles within or adjacent to the site;
 - ▶ To identify and evaluate potential impacts of the development on water voles;
 - ▶ To provide sufficient data to inform a Natural England licence application, if required, including an approximate population estimate based on the likely number of females;

- ▶ To outline the measures required for avoiding and mitigating negative impacts, including compensation of habitat losses if necessary, and make recommendations for ecological enhancement; and
- ▶ To record signs of American mink *Neovison vison*, (a significant predator of water voles), otter *Lutra lutra* and brown rat *Rattus norvegicus*.

1.3 Site Description

- 1.3.1 The northern boundary of the application site is demarcated by New Road (A259), a major trunk road from Littlehampton to Worthing. A spur road off New Road, called Brook Lane, enters the western quarter of the site and leads to Brook Lane Caravan Park. The southern boundary is delineated by Black Ditch, beyond which is the south coast railway line. The wider landscape is dominated by residential and industrial development with Rustington Golf course and open fields to the north and grass fields to the east and west. Figure 1.1 shows the application site and survey boundary.
- 1.3.2 The application site is dominated by areas of rank semi-improved grassland with tall ruderal vegetation. A narrow strip of broadleaved plantation woodland forms the northern boundary whilst a small area of semi-natural broadleaved woodland is located in the south of the site. A ditch is located along the southern boundary of the site. The topography of the site is generally flat. The water vole survey focused primarily on the banks of the ditch as well as an area of vegetation approximately 2m from the top of the bank.

1.4 Proposed Construction Activities

- 1.4.1 Planning consent is being sought to develop the site for an 11,000sqft food retail outlet and a 6,250sqft A3 (TBC) retail unit, together with associated access roads, parking for 210 vehicles and landscaping. A separate but related scheme on land to the east of the site has recently been granted consent. There will also be a requirement to improve existing access to the site which is likely to involve widening of an existing track and construction of a roundabout. The proposals for the site are shown in Figure 1.2.

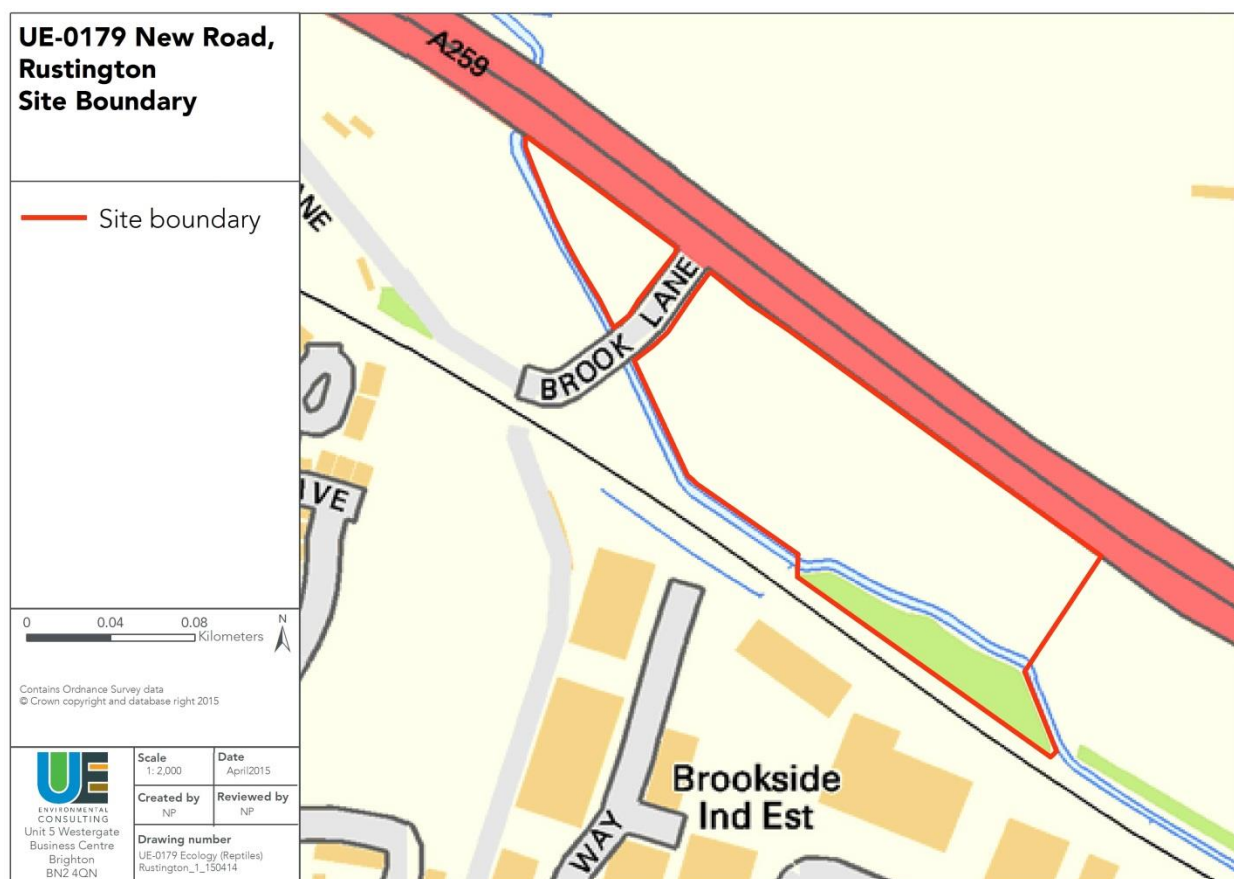


Figure 1.1: Application site boundary

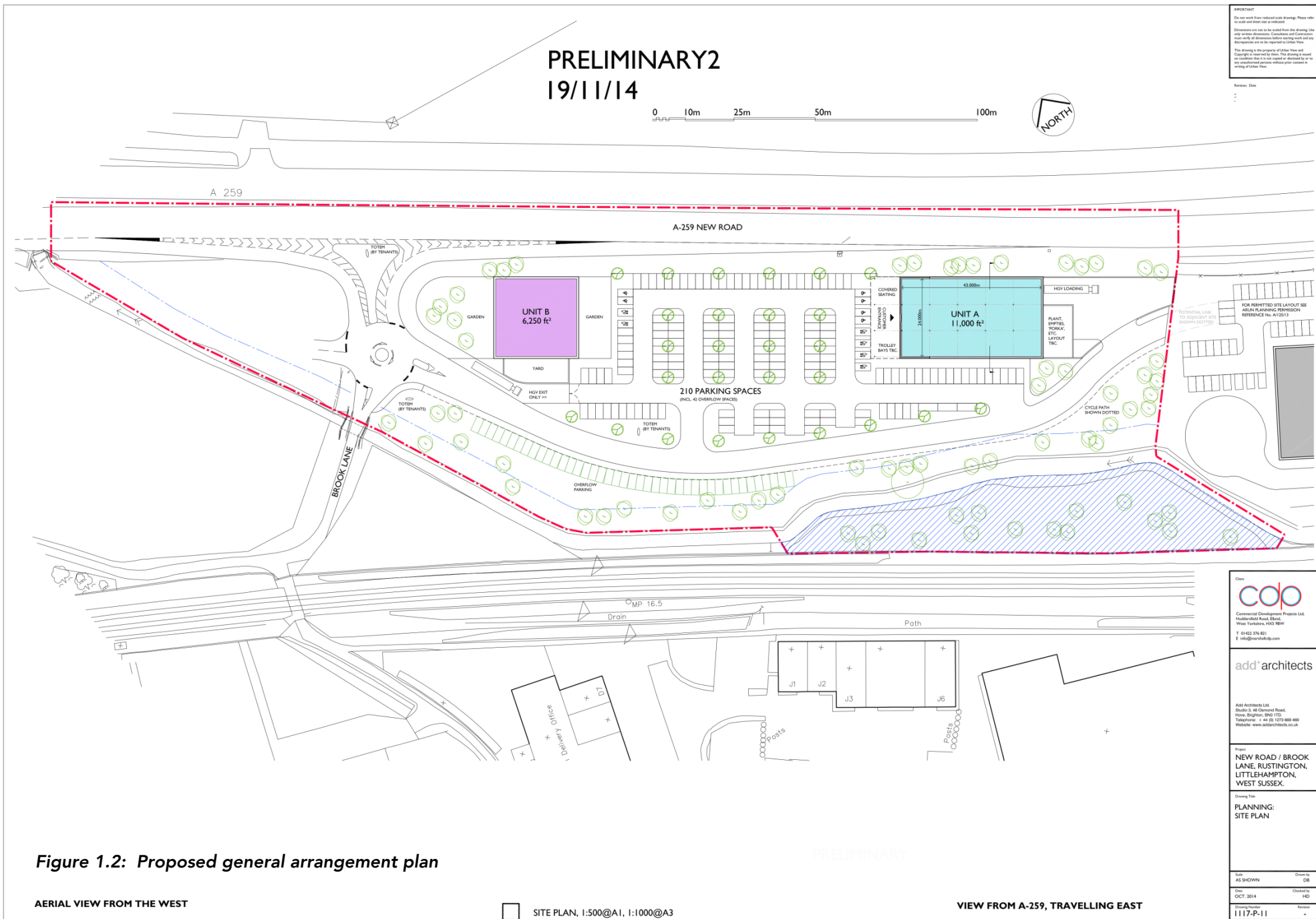


Figure 1.2: Proposed general arrangement plan

AERIAL VIEW FROM THE WEST

PRELIMINARY

2 Water Vole Distribution, Ecology and Status

2.1 Distribution

- 2.1.1 Currently the water vole *Arvicola amphibius* has a patchy, fragmented distribution throughout Britain, with strongholds in southern and eastern Britain as well as Anglesey, the Isle of Wight, Scotland and some upland areas including Snowdonia, the Cairngorms and the Peak District. The water vole in Britain is associated with riparian habitat, with the species having adopted a semi-aquatic lifestyle. Water voles live in burrows dug into the river bank and feed primarily on vegetation.
- 2.1.2 Over the last 100 years the water vole has declined dramatically both in numbers and distribution throughout the UK. The main factors responsible for this decline are changes in land use and riparian habitat management which have resulted in both habitat loss and degradation, and led to the fragmentation and isolation of water vole populations (Strachan et al. 2011). These changes have also left water vole populations vulnerable to predation by American mink *Neovison vison* and environmental effects from drought, flooding, pollution and disease.

2.2 Ecology

- 2.2.1 British water voles are semi-aquatic mammals that live in colonies spread along watercourses in a series of contiguous territories. Water voles show a preference for sites with wide swathes of riparian vegetation, both on the banks and in the water, with highly layered bank-side vegetation containing tall grasses and stands of vegetation which provide both food and cover. In general a preference is also shown for slow-flowing, relatively deep water courses, with steeper banks that are easy to dig into. Although generally associated with rivers, water voles can be found inhabiting the banks of canals, lakes, ditches, ponds and reedbeds.
- 2.2.2 During the summer water voles primarily feed on aerial stems and leaves of waterside plants, with over 227 species having been recorded as being eaten (Strachan and Jeffries, 1993). In winter their diet shifts to include roots, bark and bulbs, with fruits also providing important sustenance through the autumn. Water voles do not hibernate although they do become less active during winter.
- 2.2.3 The water vole breeding season lasts from March to October, with females producing 2 to 5 litters of between 5 and 8 young. However, this fecundity is balanced by high mortality rates. The majority of water voles survive less than two winters and in some colonies over winter mortality can be up to 70%. Breeding female water voles are territorial, demarcated by scent-marked latrines. Other adult females are normally excluded but a breeding female may share her territory with their female young. It is estimated that there is an approximate average of six latrines per territorial adult female (Woodroffe et al., 1990). Males are not territorial but compete for access to females over a series of territorial female ranges.

2.3 Status, Legislation and Policy

2.3.1 Water vole is fully protected by the Wildlife and Countryside Act 1981 (and subsequent amendments). The legislation makes it an offence to:

- ▶ Intentionally kill, injure or take a water vole.
- ▶ Possess or control a live or dead water vole, any part of, or anything derived from a water vole.
- ▶ Intentionally or recklessly damage, destroy or obstruct access to any place that a water vole uses for shelter or protection.
- ▶ Intentionally or recklessly disturb a water vole while it is occupying a structure or place that it uses for shelter or protection.

2.3.2 Local Planning Authorities are obliged to take a wider view of biological conservation when undertaking their functions. Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006 states that public authorities must have regard to the conservation of biodiversity. Section 41 of the Act requires the Secretary of State to maintain a list of Habitats and Species of Principal Importance in England; the list includes water vole.

2.3.3 Furthermore, Government policy is clear that planning decisions must promote protection and recovery of protected and priority species linked to both national and local targets (National Planning Policy Framework – Section 11: Conserving and enhancing the natural environment).

3 Methods

3.1 Guidance and Best Practice

3.1.1 The survey was carried out in accordance with current good practice guidelines as described in the following documents:

- ▶ *Water Vole Conservation Handbook*, 3rd edition (Strachan *et al*, 2011);
- ▶ *Water Vole: Guidance for planners and developers* (English Nature, 2001).

3.2 Desk Study

3.2.1 Sussex Biological Records Centre SxBRC was consulted for records of water vole within a 1km radius as part of the Preliminary Ecological Appraisal carried out by Middlemarch Environmental (2014).

3.3 Habitat Suitability Assessment

3.3.1 A preliminary habitat suitability assessment (Harris *et al.* 2009) was carried out, with specific attention paid to features indicative of suitability for water vole presence such as:

- ▶ Well-developed bankside and emergent vegetation;
- ▶ Year round availability of food sources;
- ▶ Suitable refuge areas above extremes in water levels;
- ▶ Steep banks suitable for burrowing;
- ▶ Permanent open water;
- ▶ Lack of disturbance through poaching, grazing and /or recent management; and
- ▶ Nest building opportunities in vegetation above water level.

3.4 Field Surveys

3.4.1 The objective of the survey was to establish the presence or likely absence of water voles from areas of potentially suitable habitat, particularly where they could be affected by the proposals for the site. The optimal survey period is April to October (Natural England Standing Advice). Ideally two visits should be carried out initially, one at either end of the optimal period. Given that water vole presence was confirmed during the Preliminary Ecological Appraisal in October 2014, a further two visits were carried out between April and May to assess relative abundance and focal areas for water vole activity.

3.4.2 Water vole survey normally involves the searching of one bank of a water course, including an area at least two meters from the top of the bank, for water vole field signs. These include:

- ▶ **Droppings and Latrines:** Droppings are the most distinctive field sign, approximately 8 – 12mm in length often with a blunt end. They are usually found accumulated at latrine sites, close to the water's edge, near the nest or at the boundaries of territories.
- ▶ **Feeding stations:** These are piles of neat chewed vegetation found along water vole pathways within vegetation or at the edge of the water. The sections are typically 10cm long with the chewed ends being at approximately 45° and often showing the marks of the two large incisors.
- ▶ **Burrows and nests:** As many animals and birds will construct holes in the river bank, burrows found on their own cannot be regarded as conclusive evidence of water vole presence. Water vole burrow entrances are typically higher than they are wide; with a diameter of 4 – 8cm. Burrows away from the water can also sometimes have grazed 'lawns' surrounding them, where the vegetation has been grazed within easy reach of the hole. Most nests are created underground within burrows. However, in areas of fen and rush pasture nests may sometimes be woven and found within tussocks.
- ▶ **Footprints:** As with all rodents, water vole footprints show variation between the fore and hind feet. Fore-foot prints show four toes which are splayed in a star-like arrangement. Hind-foot prints show five toes with the outer toes on either side being at right angles to the middle three. However, as there is again significant overlap with the prints of other species, (for example with juvenile brown rats), footprints may not be conclusive without the presence of other field signs.

3.5 Evaluation of Results

3.5.1 Population size is problematic to evaluate as water voles live at different densities dependant on habitat, type of waterway and time of year at which the survey was undertaken. However, there appears to be a good correlation between the number of latrines recorded on a site and the number of breeding females present. This equates very approximately to one breeding female for every six latrines recorded.

3.6 Limitations

3.6.1 A period of heavy rainfall preceded the first survey which may have resulted in a rise in water levels which could potentially obscure field signs such as latrine sites, footprints and burrow entrances close to the waterline. Access could not be gained to survey land to the east of the site due to construction works for a separate development. See Appendix II for general Legal and Technical Limitations which apply to this document.

3.7 Personnel

3.7.1 Surveys were undertaken by Sam Pottier BSc (Hons) MSc ACIEEM and Nick Pincombe BA (Hons) MSc CEnv MIEMA MCIEEM. Both have several years' experience of carrying out habitat and protected species surveys.

4 Results

4.1 Desk Study

- 4.1.1 The desk study (Middlemarch Environmental, 2014) yielded a single record of water vole from within the 1km search area, from 950m north-east of the site recorded in 2011. Water vole could hence be using the riparian habitats within the application site boundary.
- 4.1.2 Water vole populations in Sussex are critically low with an estimated loss of over 90% in the last 30 years¹. The only remaining large populations of water voles in Sussex are on Chichester Coastal Plain (West Sussex), and on Pett and Rye Levels (East Sussex). There is also a re-introduced population of water voles on the River Arun which is believed to now be breeding with remnant Arun valley populations.

4.2 Habitat Suitability Assessment

- 4.2.1 The Preliminary Ecological Appraisal identified the Black Ditch at the southern site boundary as an area of suitable habitat for water vole. The ditch is a slow-moving watercourse, approximately 3m wide, which runs for 420m along the southern length of the site and extends at least 390m east where it meets the B2187 Mill Lane. Black Ditch runs in culvert under the A259 to the north where it continues into the wider countryside and is linked to a number of large ponds.
- 4.2.2 The banks of the ditch vary between around 20cm and 60m in height and generally slope relatively steeply (c.70° angle) down to the water, with a natural, earthy substrate suitable for burrowing animals. Abundant bankside vegetation provides a year round source of food, including sweet vernal grass *Anthoxanthum odoratum*, cock's foot *Dactylis glomerata*, pendulous sedge *Carex pendula*, willow herb *Epilobium spp.* and common reed *Phragmites australis*, as well as nesting opportunities where the vegetation is thickest. The adjacent habitat is principally rough semi-improved grassland on the north bank with occasional shrubs and bushes, and semi-natural broadleaved woodland on the south bank.
- 4.2.3 The ditch is likely to be permanently inundated and was approximately 50cm deep in spring 2015, although the water level is likely to fluctuate dependent on rainfall. However, it is considered that it will rarely top the banks, which means that suitable refuge areas are likely to always be present. The water quality is generally good, however, there are significant accumulations of litter around the culvert under Brook Lane. The site does not appear to be frequently managed, and is not accessed by the public. As a result disturbance along the banks is low.

¹ Sussex Wildlife Trust Living Landscapes project, accessed online [26/5/15] at:
http://www.sussexwildlifetrust.org.uk/livinglandscape/living_wetlands/page00024.htm

4.3 Field Survey

- 4.3.1 Table 4.1 shows a summary of the survey results. A map showing the indicative locations of recorded field signs is given at Appendix I.
- 4.3.2 No water voles were directly observed during the survey, however, numerous signs confirming the presence of water vole were recorded along the length of the ditch within the site, including several latrines and feeding stations, and one or two lawns. No footprints or pathways were noted. Several possible burrows were recorded along the length of the ditch, many of which appear to collapsed or partially collapsed. Burrows alone would not be sufficient to infer the presence of water voles, particularly with brown rats also in evidence at the site, and as a result they are not depicted on the map at Appendix I. However, taken alongside the other field signs, there is conclusive evidence that a population of water voles is present within the site boundary.
- 4.3.3 No signs of mink or otter were noted on either survey visit, however, brown rat droppings were recorded. Coot *Fulica atra* and mallard *Anas platyrhynchos* were also observed.
- 4.3.4 Figure 4.1 shows examples of the latrines and feeding stations recorded during the survey. Although such field signs are present along the whole length of the ditch within the site, they are far more numerous along the stretch on the west side of Brook Lane. This part of the site has much denser vegetation dominated by common reed; as a result it provides greater cover for water voles as well as an abundant food source.

Table 4.1: Summary of survey results

Visit	Date	Burrows	Latrines / droppings	Feeding stations	Lawns	Footprints	Visual sightings
1	13/04/15	12	22	8	2	0	0
2	07/05/15	14	21	12	1	0	0



Figure 4.1: Water vole latrine and feeding station

5 Evaluation

5.1 Habitat and Site Suitability

- 5.1.1 The site provides a 420m section of good quality habitat for water voles, with plentiful cover, abundant food sources and relatively stable water levels. Bank sides are steep with a substrate suitable for burrowing, and there are low levels of site disturbance. No signs indicating the presence of otter or mink were noted during the survey.
- 5.1.2 Suitable habitats are also present in adjacent areas, particularly to the north and west, where Black Ditch continues into Rustington Golf Course and the wider countryside, and is associated with a number of large ponds. Black Ditch also continues east into an adjacent construction site which could not be surveyed. Beyond here the watercourse continues east into the urban fringe of Rustington.

5.2 Presence or Absence of Water Vole

- 5.2.1 No water voles were recorded on any of the survey visits to the site. However, a range of field signs were recorded, including latrines, feeding stations and lawns. These confirm that water vole is present within the application site boundaries.
- 5.2.2 Twenty two latrine sites were noted along the surveyed north bank of Black Ditch on the first survey visit, with 21 latrines recorded on the second visit. The number of water voles latrines counted at a site during the breeding season gives an indication of the strength of the water vole colony equating, very approximately, to one breeding female for every six latrines recorded (Morris *et al.*, 1998, cited in Strachan *et al.*, 2011). On this basis there is considered to be approximately three breeding females within the application site.
- 5.2.3 The much lower density of water vole field signs in the eastern part of the site (no signs were observed in the final 110m stretch) may indicate that the application site is at the eastern limit of the local water vole population.

5.3 Impact Assessment and Mitigation

- 5.3.1 Water voles are considered to be using the whole length of the ditch within the site boundary, albeit that activity appears to be focused on the western half of the site. However, the burrows made by this species do not normally extend inland further than 5m from the top of the bank. For the majority of the length of the ditch, the construction zone as indicated on Figure 1.2 will be located more than 10m from the top of the bank thereby limiting the scope for direct impacts.

Direct impacts

- 5.3.2 Road widening along Brook Lane and the junction arrangement for the proposed new roundabout to provide access to the site is likely to result in negative impacts in the part of the site which appears more intensively used by water voles. The following direct impacts are predicted, albeit centred on a relatively short stretch of ditch of approximately 20m:
- ▶ Permanent small-scale loss of habitats (including burrows) and temporary habitat fragmentation due to vegetation removal, ground clearance, and engineering works to widen the road and install a new culvert over Black Ditch;
 - ▶ Death or injury to water voles which may be present during the works; and
 - ▶ Disturbance during construction to water voles while occupying a structure or place used for shelter (but not during operation of this retail development proposal).
- 5.3.3 Highways engineers have advised that it will not be possible to avoid these impacts by altering the junction arrangement so that the roundabout is located further north/east into the site, which could otherwise remove the need for a new culvert and road-widening on Brook Lane. This is due to constraints in achieving safe junction geometry and required deceleration / acceleration feeder lanes to the A259.
- 5.3.4 Consequently a mitigation strategy is required to ensure that (a) water voles are not present during the works, and (b) there is no overall loss of suitable habitats. This is likely to focus on displacement of water voles from the construction zone immediately prior to commencement, and subsequent compensation of habitat losses. Mitigation should be implemented in accordance with an agreed Method Statement, which may necessitate a Natural England conservation licence requiring overall conservation benefits to be achieved.
- 5.3.5 As the proposals for the site have not yet been finalised the following recommendations provide an indicative outline of what is likely to be necessary as part of the agreed Method Statement to protect the water vole population known to be using the ditch:
- ▶ Displacement of water voles and subsequent engineering works to create a new culvert to widen Brook Lane should be carried out between 15 February and 15 April inclusive.
 - ▶ Manipulation of bankside habitat along the stretch of ditch to be affected by construction to encourage water voles to leave the area. Vegetation should be cleared within the working area, plus 3m up- and downstream, as well as 3m from the bank top. Vegetation should be trimmed down to bare earth, and emergent aquatic vegetation cut back to water level. As the area to be cleared is relatively small it is unlikely that compensatory habitats will need to be in place prior to displacement.
 - ▶ Following clearance, arisings should be raked-off and burrow entrances checked to ensure they have not become blocked. The cleared area should be left bare of vegetation for 3 to 5 days to allow any remaining animals to relocate.
 - ▶ Following habitat manipulation, the cleared area should be re-surveyed for signs of water vole activity. Assuming there is no evidence that water voles are still present, a destructive search of burrows within the construction zone should be undertaken by a suitably experienced ecologist.

- ▶ Following the destructive search, construction works should be undertaken within 2 to 3 days. If this is not possible, it will be necessary to maintain the working area as bare ground until the work is complete.
- ▶ It may be necessary to erect exclusion fencing in order to prevent animals from moving back into the construction zone from adjacent areas. The fencing will need to exclude terrestrial and aquatic habitat, with mesh being used across the ditch channel to prevent damming of the watercourse. It is important to ensure that any mesh used does not have the potential for water voles to become entrapped. Fencing should be 1.2m high and buried to a depth of at least 50cm.
- ▶ Displacement of animals is suitable only if the works will affect less than 50m of the watercourse. If more extensive works become necessary a translocation may be required. This would involve the erection of exclusion fencing and the trapping of animals within the construction zone. Trapped animals would then be removed to a suitable receptor for the duration of construction. Due to the limited nature of works proposed, water voles could then be released back into the area following completion or allowed to re-colonise naturally.
- ▶ In order to achieve conservation benefits it will be necessary to implement a habitat creation or enhancement strategy. This could include creating new areas of wetland linked to the main channel of Black Ditch. Within the application site, the area to the west of Brook Lane could provide a suitable area as this is not currently proposed for development. Enhancements could include areas of reedbed planting east of Brook Lane to increase vegetation cover, as this part of the site currently has fewer signs of water vole activity.

5.3.6 It is recommended that water vole surveys are continued during summer 2015 (to October), both within the application site and adjacent stretches of watercourse, to further investigate the site's importance to the local water vole population

5.3.7 For the remainder of the site, impacts will need to be prevented by implementing a fenced buffer zone at least 5m from the top of the bank of Black Ditch. Within the buffer zone construction activities and access by site personnel and machinery should be prohibited and enforced through appropriate fencing and signage.

Indirect impacts

5.3.8 For the majority of the length of the ditch, the construction zone as indicated on Figure 1.2 will be located more than 10m from the top of the bank. Significant indirect impacts are not predicted if a buffer zone of at least 5m from the top of the bank can be maintained, however, the following indirect impacts are possible:

- ▶ Pollution from site run-off.

5.3.9 In order to mitigate this impact, standard site procedures as recommended by the Environment Agency should be adopted (such as *Pollution Prevention Guidelines 5 – Works and Maintenance in or Near Water*) to ensure that no contaminants or effluent (e.g. oil, fuel or

chemical spills) are released into aquatic environments during construction, in particular Black Ditch.

5.4 Recommended Ecological Enhancements

- 5.4.1 Ecological enhancements at the site could include creating new areas of wetland linked to the main channel of Black Ditch. Within the application site, the area to the west of Brook Lane could provide a suitable area as this is not currently proposed for development. Enhancements could include areas of reedbed planting east of Brook Lane to increase vegetation cover, as this part of the site currently has fewer signs of water vole activity.
- 5.4.2 Any works carried out to the ditch during operation of the proposed development should be carried out with water voles in mind, following best practice guidelines. Any management of bankside vegetation should be carried out on a yearly rotation with only one side of the ditch being mown in any one year. Where possible, routine ditch maintenance should be carried out in autumn to minimise effects on water voles. Any de-silting or re-profiling of the ditch which becomes necessary should also be carried out in a sympathetic manner; working as far back from the water's edge as possible to minimise compaction by machinery.

6 Conclusions

6.1 Introduction

- 6.1.1 A water vole survey was carried out for the site of a proposed retail development at Land south of New Road (A259), Rustington in West Sussex.
- 6.1.2 The study was undertaken to establish the presence or likely absence of water vole at the site, identify and evaluate potential impacts of the development on water voles, and make recommendations accordingly. Two surveys were undertaken between 13 April and 7 May 2015 in accordance with current good practice guidelines (Strachan *et al.*, 2011). Surveys were comprised of searches of one bank of the watercourse, including an area at least two meters from the top of the bank, for water voles and their field signs (such as droppings, latrines, feeding stations and footprints).

6.2 Results

- 6.2.1 The desk study (Middlemarch Environmental, 2014) yielded a single record of water vole from within the 1km search area, from 950m north-east of the site recorded in 2011. Water vole could hence be using the riparian habitats within the application site boundary.
- 6.2.2 The majority of the application site is rough semi-improved grassland. There is a small area of woodland in the southern part of the site and a ditch which runs along the southern site boundary.
- 6.2.3 The site provides a 420m section of good quality habitat for water voles, with plentiful cover, abundant food sources and relatively stable water levels. Bank sides are steep with a substrate suitable for burrowing, and there are low levels of site disturbance. No signs indicating the presence of otter or mink were noted during the survey.
- 6.2.4 Suitable habitats are also present in adjacent areas, particularly to the north and west, where Black Ditch continues into Rustington Golf Course and the wider countryside, and is associated with a number of large ponds. Black Ditch also continues east into an adjacent construction site which could not be surveyed. Beyond here the watercourse continues east into the urban fringe of Rustington.
- 6.2.5 No water voles were recorded on any of the survey visits to the site. However, a range of field signs were recorded, including latrines, feeding stations and lawns. These confirm that water vole is present within the application site boundaries. It is estimated that at least three breeding females are using the habitats within the application site.

6.3 Evaluation

- 6.3.1 Road widening along Brook Lane and the junction arrangement for the proposed new roundabout to provide access to the site is likely to result in negative impacts in the part of the site which appears more intensively used by water voles. The following direct impacts are predicted, albeit centred on a relatively short stretch of ditch of approximately 20m:
- ▶ Permanent small-scale loss of habitats (including burrows) and temporary habitat fragmentation due to vegetation removal, ground clearance, and engineering works to widen the road and install a new culvert over Black Ditch;
 - ▶ Death or injury to water voles which may be present during the works; and
 - ▶ Disturbance during construction to water voles while occupying a structure or place used for shelter (but not during operation of this retail development proposal).
- 6.3.2 Highways engineers have advised that it will not be possible to avoid these impacts by altering the junction arrangement due to constraints in achieving safe junction geometry and required deceleration / acceleration feeder lanes to the A259.
- 6.3.3 Consequently a mitigation strategy is required to ensure that (a) water voles are not present during the works, and (b) there is no overall loss of suitable habitats. This is likely to focus on displacement of water voles from the construction zone immediately prior to commencement, and subsequent compensation of habitat losses. Mitigation should be implemented in accordance with an agreed Method Statement, which may necessitate a Natural England conservation licence requiring overall conservation benefits to be achieved.

6.4 Recommendations

- 6.4.1 It is recommended that water vole surveys are continued during summer 2015 (to October), both within the application site and adjacent stretches of watercourse, to further investigate the site's importance to the local water vole population
- 6.4.2 For the remainder of the site, impacts will need to be preventing avoided by implementing a fenced buffer zone at least 5m from the top of the bank of Black Ditch. Within the buffer zone construction activities and access by site personnel and machinery should be prohibited and enforced through appropriate fencing and signage.
- 6.4.3 In order to mitigate potential pollution impacts, standard site procedures as recommended by the Environment Agency should be adopted to ensure that no contaminants or effluent (e.g. oil, fuel or chemical spills) are released into aquatic environments during construction.
- 6.4.4 In addition to the above requirements, a range of recommendations are made in relation to the landscape designs for the development and ongoing site management in order to maintain or enhance the value of the site to water voles post-construction.

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Appendix I: Water Vole Survey Map

Please see following page.

New Road, Rustington Water Vole Field Signs

- ★ Feeding station
- ▲ Latrine
- Ditch
- Site boundary

0 0.025 0.05
Kilometers



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Scale
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Date
May 2015

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Drawing number
UE-0179_Rustington
WaterVole_1_150507



Appendix II: Legal and Technical Limitations

- This report has been prepared by Urban Edge Environmental Consulting Ltd (UEEC Ltd) with all reasonable skill, care and diligence within the terms of the contract made with the Client to undertake this work, and taking into account the information made available by the Client. No other warranty, expressed or implied, is made as to the professional advice included in this report or any other services provided by us.
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- This report has been prepared using factual information contained in maps and documents prepared by others. No responsibility can be accepted by UEEC Ltd for the accuracy of such information;
- Populations of animals and plants are often transient in nature and a single survey visit can only provide a general indication of species present on site. Time of year when the survey was carried out and other variations will also influence the results of the survey (e.g. it is possible that some flowering plant species which flower at other times of the year were not observed). While no biological survey can guarantee that all cues and signs of protected or notable species will be recorded, the authors are confident that key indicators of these species being present on site were noted. The possibility nonetheless exists for other species to be present on the site which were not recorded or otherwise indicated by the survey.
- Any works undertaken as a consequence of the recommendations provided within this report should be subjected to the necessary health & safety checks and full risk assessments.

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