

60654

TACP



*FIVE MILE LANE IMPROVEMENTS
WATER VOLE SURVEY REPORT
PARSONS BRINCKERHOFF
OCTOBER 2015*

Parsons Brinckerhoff

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LIST OF ABBREVIATIONS

NERC	Natural Environment Research Council
NRW	Natural Resources Wales
SEWBRc	South East Wales Biodiversity Record Centre
VoG	Vale of Glamorgan

EXECUTIVE SUMMARY

<p>This report presents the findings of a water vole survey undertaken as part of the Five Mile Lane Improvements Scheme (the Scheme).</p>	

There were no historical records of water voles within 2km of the proposed alignment route but there are some records within 5km radius of the Scheme.

The survey was carried out along the banks and channels of the watercourses. The presence of water voles was determined by looking for field signs which include latrines, burrows, tracks, prints and feeding signs.

Although some habitats with good potential for water voles were identified, the majority of the water bodies examined were unsuitable. Gravelly and rocky stream banks had limited burrowing potential for rodents. Also the vegetation favoured by water voles was scarce as many of the water courses lacked submerged and marginal plants. Several rodent burrows were discovered during the survey, however their size suggested much smaller or much bigger rodents, possibly the other two species of voles and brown rats. Finally, moderate to fast flowing water in the River Waycock also create poor habitat for water voles.

Overall, no evidence of water voles was found at the time of the survey, therefore there are no implications for the Scheme with regards to water vole and the water bodies within the study area.

1 INTRODUCTION

- 1.1 This report presents the findings of a water vole (*Arvicola amphibius*) survey undertaken as part of the A4226 Five Mile Lane Improvements, by TACP, on behalf of Parsons Brinkerhoff. The scheme is located in the Vale of Glamorgan (VoG).
- 1.2 During the scoping survey, undertaken in March and April 2014, it was noted that several water bodies such as streams and agricultural ditches should be assessed for their potential to support water voles, a protected species included in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) in respect of Section 9 (4). There were known previous records of water voles within 5km radius from this area.
- 1.3 This report was produced following the site visit on the 30th June and 2nd July 2014. The main objective of the survey was to evaluate all known water bodies and the adjacent terrestrial habitat within the development area, for the likelihood to support water vole population. There are a number of drainage ditches and small streams located within the study site, and the Waycock Brook passes beneath the existing A4226. These were examined for evidence of water vole during the survey, and are described below in terms of their ability to support this species.
- 1.4 The report describes the method used, survey undertaken and the results, including an evaluation of the findings with recommendations. For locations, refer to Figure 1.0 A-B.

2 WATER VOLE LEGISLATION AND ECOLOGY

2.1 Legislation

- 2.1.1 Since 1998 the water vole has received legal protection through being added to Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) in respect of Section 9 (4). The water vole gained additional protection through the amendment of Schedule 5 by Statutory Instrument 2008 No. 431. Water voles and their habitat now receive full protection. This makes it an offence to kill or injure water voles, and to damage, destroy or obstruct access to places of shelter or protection (e.g. burrow systems) and to disturb voles while they are using such a place.
- 2.1.2 The water vole is listed under Section 41 and 42 of the NERC Act 2006 (for England and Wales respectively) and Section 2 of the Nature Conservation (Scotland) Act 2004. It is therefore a priority species in England, Wales and Scotland. Government policy requires that local planning authorities consider such species when determining planning applications.

2.2 Ecology

- 2.2.1 The water vole is the largest species of vole in Britain and inhabits canals, rivers, streams, ditches and other wetland areas. They create burrows in the banks and feed primarily on reeds, rushes, sedges and other aquatic vegetation. Water voles swim, dive and climb well and can be found in quite high densities in good habitat. They are, however, declining in the UK due to predation by the American mink (*Neovison vison*) and a general decline in habitat quality. Water voles do not hibernate but spend most of the winter below ground.

3 METHOD

3.1 Desk study

3.1.1 A desktop study was carried out as part of the ecological appraisal to determine the presence of any historical protected species records or designated statutory or non-statutory sites of nature conservation value within a 5km radius of the study area. The South East Wales Biodiversity Records Centre (SEWBRc) was contacted to supply this information. There has also been consultation with the VoG County Ecologist and NRW during 2014.

3.2 Field survey

3.2.1 A water vole survey of the banks of seven water bodies, located within the study area was completed.

3.2.2 The presence of water voles was determined by looking for field signs which include latrines, burrows, tracks, prints and feeding signs. A full description of these can be found below. Searches were also undertaken for any habitat features likely to either support or discourage water voles from using the site, such as the structure and composition of vegetation, and the substrate of the banks. The survey was carried out along the banks and within the watercourse channels.

3.2.3 However, it is important to note that water vole field signs must be interpreted carefully in order to distinguish differences in habitat use, ranging from inhabiting and foraging to excursion activities. The age of individual field signs and specific combinations in which they are found is also fundamentally important in determining the current use of particular habitats.

3.2.4 The survey was conducted on 30th June and 2nd July 2014 (half day each).

3.2.5 The following field sign descriptions were adapted from the *Water Vole Conservation Handbook, Second Edition* (Strachan & Moorhouse 2006).

- **Burrows**

Water vole burrow entrances are typically wider than high with a diameter of between 4 and 8cm. At the waters' edge the entrances may occasionally appear larger due to erosion but the tunnel soon contracts down to the size of approximately two fingers. Field vole, bank vole and wood mouse dig smaller burrows of 2-3 cm across. Rat burrows are slightly larger in size than those of water voles at 8-10cm, but are best identified by the fan-shaped spoil heap outside the entrances and well-trodden runs that link them. Rat burrows are usually dug higher up the bank than those of water voles. Water vole burrows can be located just above the water level on steep banks, some below the water level and others occurring within vegetation up to 3metres from the water.

- **Faeces**

Droppings are the most distinctive field sign. Droppings are about 8-12mm long and 4-5mm wide, cylindrical with blunt ends and symmetrical. The colour can vary from green, brown, black and even purple, depending on what food has been eaten and its water content. Droppings have a texture of putty when fresh but when dry may show green concentric rings of fine plant material if broken open. Rat droppings are always larger than water vole droppings and have an unpleasant odour.

- **Latrines**

Although a few droppings may be found scattered along runways, most are usually deposited at discrete latrine sites near the nest and where they leave or enter the water. Latrines are established and maintained from February to November. Scent from the lateral flank glands is deposited on the latrine when the water vole drum-marks with its hind feet, so that many latrines often show a flattened mass of old droppings topped with fresh ones. Rat droppings tend to be scattered along their runs, or deposited in latrine sites away from the waters' edge, often in dark corners under bridges.

- **Feeding Stations**

Food items are often brought to favoured feeding stations along water voles' pathways or at a haul-out platform along the waters' edge. These show feeding remains as a neat pile of chewed lengths of vegetation. The sections are typically 10 centimetres long showing the marks of two large incisors and are good field signs of the presence of Water voles. These chopped sections of vegetation are often taken into the burrow entrances by the Water voles and laid up as stores along the tunnels or in chambers. By matching the pieces with local plants growing on the bank, the water vole diet can be determined. Rat feeding stations may show piles of snail shells or fruits or even skinned frogs (during the spawning season).

- **Runs in Vegetation**

These are most often found within two metres of the waters' edge and take the form of low tunnels pushed through the vegetation. Pathway width may be 5-9cm across and often branch many times, leading to the waters' edge, burrow entrances or favoured feeding areas. Rat runs however, are usually very obvious, as clear or bare pathways, linking burrows and often running along the bank away from the waters' edge.

- **Footprints**

Although footprints (of many species besides water voles) may be readily found along the soft margin of a water course, they are not the easiest field sign to use. Large adult water vole tracks will appear very similar to those of juvenile rats. As with all rodents, the imprints show four toes in a star arrangement from the fore foot and five toes of the hind foot with the outer ones splayed, but often the tracks of the hind feet partially overlap those of the fore. The hind foot typically measures between 26-34mm and is noticeably smaller than that of the common rat at 40-45mm (heel to claw measurements). The brown rat is also heavier and so leaves a deeper impression. The hind feet also show a pad arrangement that may allow distinction from brown rats. Right and left tracks lie about 45mm apart and the stride averages 120mm. Typically water vole tracks occur at the waters' edge and lead into vegetation cover; rats on the other hand are more nocturnal and travel over more open ground under cover of darkness.

3.2.6 All suitable areas of each water body were closely inspected for signs such as those described above.

4 RESULTS

4.1 Desk study

4.1.1 Several records of water vole presence and/or water vole activity signs were provided by SEWBRc. There were no historical signs of water voles within the proposed alignment route but some records within a 5km radius of the study area occurred. The last record was from 1997. It was more common that water vole signs were seen rather than the animals itself, which was spotted only on one occasion in Cosmeston Lakes, approximately 5km to the east of the study area.

4.2 Field survey

4.2.1 The water vole survey of seven water bodies was conducted in June and September 2014, at an optimal time of year to undertake such a survey. Weather conditions prior to the survey were dry and the water courses were characterised by low water levels.

4.2.2 Whilst walking the banks, each water body was closely inspected for signs of water voles and the results can be found in the following summary below.

4.2.2.1 Water body 1 (Figure 1.0A and Figure 2.0)

A drainage ditch, 15m long, bisecting improved grassland to the north of the Scheme, was identified as a potential water vole habitat during the scoping visit. In fact, the ditch was dry and overgrown with wetland vegetation, such as fool's watercress (*Apium nodiflorum*), watercress (*Rorippa nasturtium-aquaticum*) and great willow herb (*Epilobium hirsutum*), at the time of the survey. To the south of the drain, a marshy grassland was created with dominant purple moor-grass (*Molina caerulea*) and frequent rushes including soft rush (*Juncus effusus*), hard rush (*Juncus inflexus*) and compact rush (*Juncus conglomeratus*). Despite the fact that the ditch was dry, it was searched still for signs of water voles, as occasionally they will inhabit watercourses with significant seasonal fluctuations and drying incidents, when the food source is abundant. However, no evidence of water vole presence was found.

4.2.2.2 Water body 2 (Figure 1.0A and Figure 3.0-5.0)

A stream, running along the semi-natural woodland to the northeast of the Scheme, was selected for surveying. The 2-2.5 m wide stream was very shallow or completely dry at places, with occasional puddles filled with 30-40cm of water, at the time of the survey. Marginal and submerged vegetation was absent, apart from the dense woodland floor dominated by ivy (*Hedera helix*), Hart's-tongue fern (*Asplenium scolopendrium*) and mosses that were creeping on the banks of the stream. The banks and bottom were mainly covered with gravel and rocks. Although small patches of clay were present, the stream had limited burrowing potential for water voles. One burrow was identified, but due to the burrows large size it is considered that this was made by a brown rat (*Rattus norvegicus*). No signs of water vole were observed at this stream.

4.2.2.3 Water body 3 (Figure 1.0A and Figure 6.0-7.0)

A pond, with an approximate 150m perimeter, was located within the Amelia Trust Farm. The pond was not fully accessible due to scrub, which surrounded about 40% of the pond bank and restricted access. A willow (*Salix* sp.) was the dominant species around the pond, which was shaded in 10-15%. The remaining banks above the high water line were accessible, although they were steep in places and vegetated with

rank grass, herbs and tall ruderals. It appeared to be between 1-2m in depth with a sediment base. Water surface was densely covered with broad-leaved pondweed (*Potamogeton natans*) and occasional patches of white water lily (*Nymphaea alba*). There was a fringe of good marginal and aquatic vegetation, such as reeds, sedges and rushes (e.g. broad-leaved reedmace (*Typha latifolia*)) and the pond was considered to be suitable for supporting water voles. A rodent feeding station was found in the grass near the pond edge but the grazing style did not resemble that of a water vole's (straight cut, rather than 45° angle). No latrines, runs in vegetation or footprints were found.

4.2.2.4 Water body 4 (Figure 1.0A and Figure 8.0-9.0)

A 100-150m ditch in an arable field runs beneath the existing A4226. The water level in the ditch was very low, 5-10cm at the deepest. The ditch was overgrown by great willow herb (*Epilobium hirsutum*), especially in the centre. The edges were dominated by grasses such as Yorkshire fog (*Holcus lanatus*), perennial ryegrass (*Lolium perenne*) and cock's foot (*Dactylis glomerata*). Herbaceous species were also abundant and represented by hogweed (*Heracleum sphondylium*), creeping thistle (*Cirsium arvense*), curled dock (*Rumex crispus*) and common nettle (*Urtica dioica*). Scarce shrubs were distributed unevenly and composed of dogwood and hawthorn. The ditch was mostly unshaded. Due to the fact that the water level in the ditch was very low and the lack of vegetation favoured by water voles, it was considered as a poor water vole habitat. No evidence of water vole presence was found.

The same ditch, but on the west hand side of the road, was over-shaded by 5-8m high trees and shrubs including alder (*Alnus glutinosa*), hawthorn (*Crataegus monogyna*), holly (*Ilex aquifolium*) and hazel (*Corylus avellana*). The bottom of the ditch composed of stones and rocks and the banks were covered with dense ivy and ferns with scarce tussocks of remote sedge (*Carex remota*). The water level did not exceed 20cm. The rocky banks did not provide good burrowing habitat and the food plants were scarce. No water vole signs were observed.

4.2.2.5 Water body 5 (Figure 1.0B and Figure 10-11)

A ditch located on the southwest side of an arable land runs along species rich hedgerow, and then continues on the west side of the semi-natural mixed woodland described in details in the Phase 1 Habitat survey report.

This ditch was about 50-60cm deep and had clay bottom and steep banks, for most of its length. It was shaded in about 80% due to the dense hedge cover, although small patches, more exposed to the sun, were also present. The ditch was lacking submerged plants and the bank vegetation was composed mostly of rank grasses and tall herbs with dense ivy and typical woodland floor plants creeping into the ditch. The banks, especially close to the woodland at the southern end, were quite rich with woodland plants. Several rodent burrows were discovered during the survey; however their size suggested that they were made by much smaller rodents, possibly the other two native species of voles. One brown rat borrow with the distinctive rat droppings at the entrance, was also present. Although this habitat has good potential to support water voles and the linkage to wildlife corridor features such as hedgerow and woodland is well established, no droppings or feeding stations were observed.

4.2.2.6 Water body 6 (Figure 1.0B and Figure 12)

The Waycock Brook and a channel of feeding it streams cross the study site. The river corridor was generally steep sided, 3-5 m wide and with moderate to fast flowing water, 20-60cm deep. The bottom was mostly gravelly with occasional bigger rocks. It is generally shaded and with little to no aquatic vegetation. Lots of ivy on the woodland floor was creeping into the river. Occasional hemlock water dropwort (*Oenanthe crocata*), Hart's-tongue, mosses and tussocks of grasses were present on the banks. The banks were regulated in some places with stone work, possibly to protect surrounding land from flooding. This habitat discourages burrowing rodents. One borrow was observed, 30m upstream from the Waycock Bridge, but the size and shape of the burrow suggested bigger rodent such as brown rat. Scattered scrub was spreading from the river banks with species composition included blackthorn (*Prunus spinosa*), ash (*Fraxinus excelsior*), goat willow (*Salix caprea*), field maple (*Acer campestre*) and hawthorn. Fast flowing water, lack of suitable submerged vegetation and steep stony banks create poor habitat for water voles. No signs were found.

4.2.2.7 Water body 7 (Figure 1.0B and Figure 13)

The stream which runs beside the Waycock road in the SSSI woodland is up to 1m deep with clay banks and base composed of gravel and bedrocks. The stream is shaded by the woodland understory in most places. The banks were medium to steep in gradient and were covered with dense woodland floor vegetation. Moss and fern communities were visible on the banks. No submerged plants were present. No burrows or latrines were found. Overall, no water vole signs were noticed.

5 CONCLUSIONS

5.1.1

5.1.2 The water vole survey included a total of seven water bodies' within the study area. The surveys strictly followed the survey methods stated above and were undertaken by suitably experienced ecologists.

5.1.3 Whilst the desktop study found several historical records of water vole activity within a 5km radius, water voles were found to be absent from the study area at the time of the survey. As such, no potential impacts to water voles or their habitat from the Scheme have been identified.

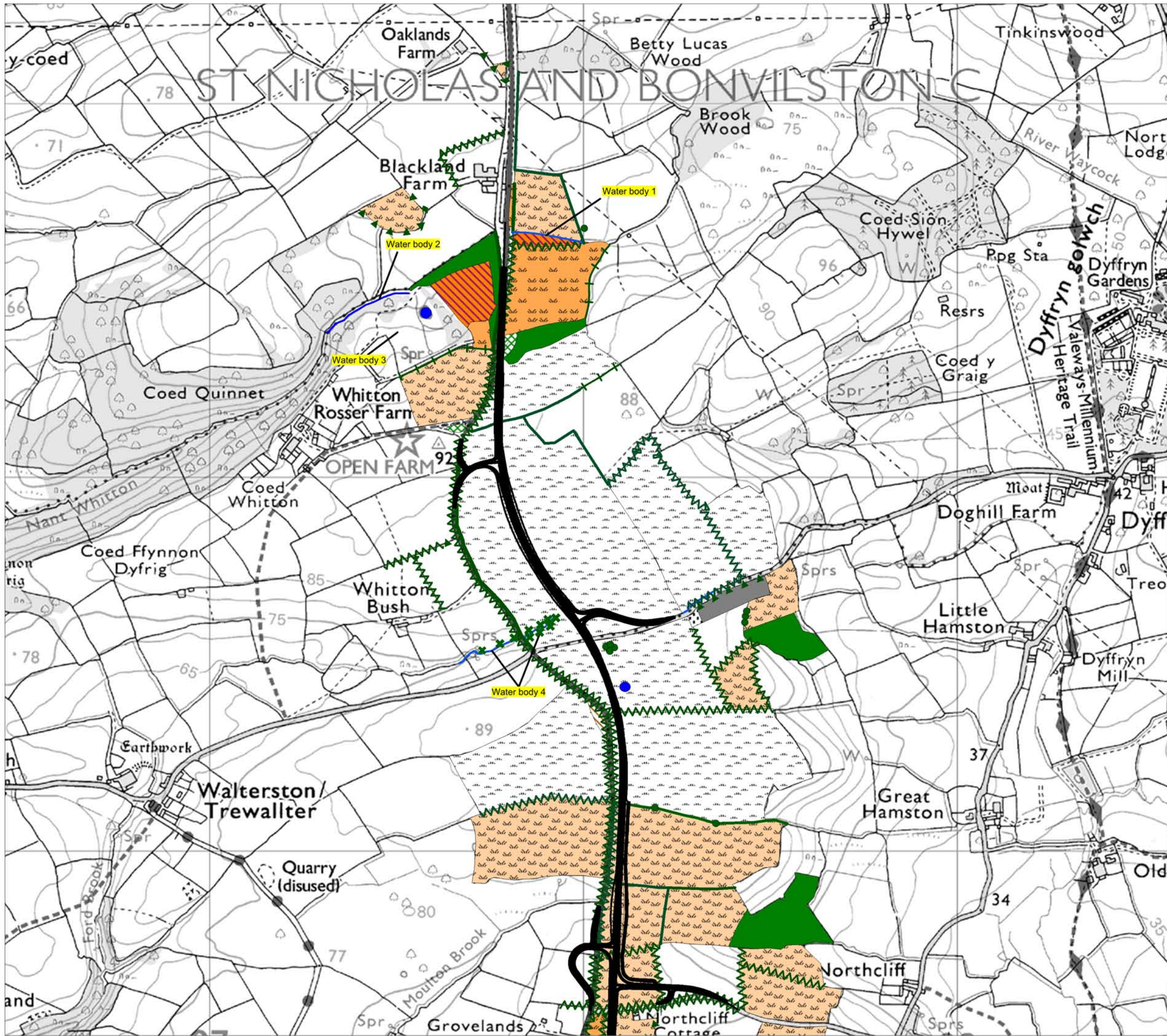
6 REFERENCES

Strachan, R. & Moorhouse, T. (2006) Water vole conservation handbook (2nd Ed.). Wildlife Conservation Research Unit, Oxford, 132pp. ISBN09546374X. Note this handbook predates the increased legal protection for water voles.

7 FIGURES

Figure 1.0 A-B
Figure 2.0 - 13

Habitats and the Water Bodies
Photographs



- Key**
- Semi-natural broadleaved woodland
 - Plantation broadleaved woodland
 - Semi-natural mixed woodland
 - Dense scrub
 - Unimproved grassland
 - Semi-improved grassland
 - Improved grassland
 - Marshy grassland
 - Poor semi-improved grassland
 - Tall ruderal
 - Standing water
 - Arable land
 - Buildings
 - No access
 - Intact hedge species-rich
 - Intact hedge species-poor
 - Hedge and trees species-poor
 - Hedge and trees species-rich
 - Defunct hedge
 - Running water

- Scattered scrub
- Broadleaved scattered trees
- Ruins

Water Bodies

N

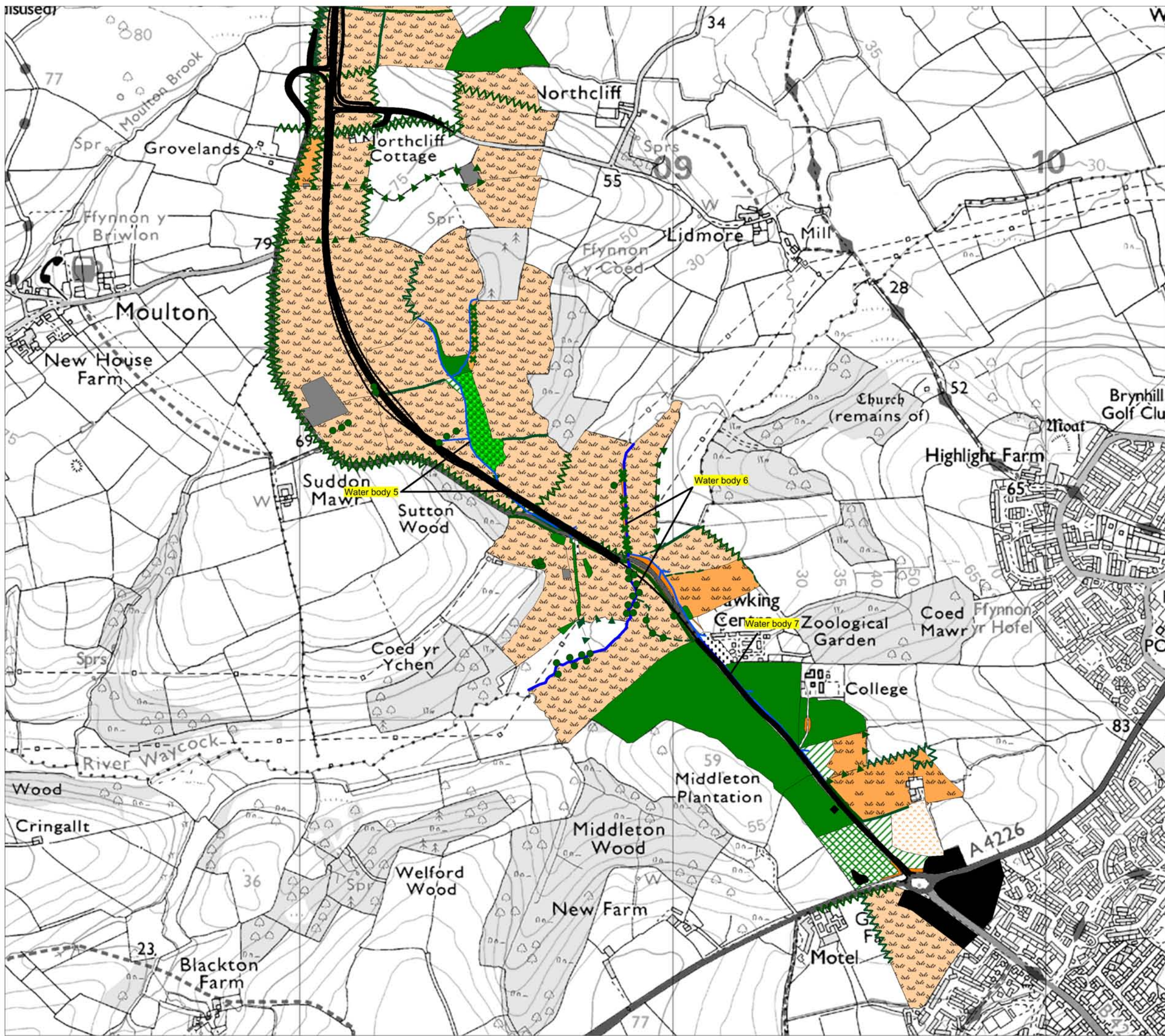
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NOTES

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FIGURE / DRAWING NO. 1.0 A	REV
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- Key**
- Semi-natural broadleaved woodland
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- Scattered scrub
- Broadleaved scattered trees
- Ruins

Water Bodies

N

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NOTES



Vale of Glamorgan A4226 Five Mile Lane Improvements Water Vole Survey

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