

WATER VOLE

CONSERVATION HANDBOOK

THIRD EDITION



WILDCRU 

Wildlife Conservation Research Unit

WATER VOLE SURVEYS

1 WHY SURVEY?

As with many mammals, a direct sighting of the water vole is not always possible. The presence or absence of water voles, therefore, has largely to be determined by survey for the

species' characteristic fieldsigns as described in Box 4:A below.

To implement the Biodiversity Action Plan for the water vole, we need to find out where they occur and how

BOX 4:A WATER VOLE FIELD SIGNS

FAECES

Droppings are the most distinctive fieldsign. These are about 8–12mm long and 4–5mm wide, cylindrical with blunt ends and symmetrical (1). The colour varies from green, brown, black and even purple, depending on what food has been eaten and its water content. They have the 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, at range boundaries and where they leave or enter the water (2,3). Latrines are established and maintained



from February to November. Scent from the lateral flank glands is deposited on the latrine when the vole drum-marks with its hind feet, so that many latrines often show a flattened mass of old droppings, topped with fresh ones (6). Rat droppings on the other hand tend to be scattered along their runs, or deposited in latrine sites away from the water's edge, often in dark corners under bridges.

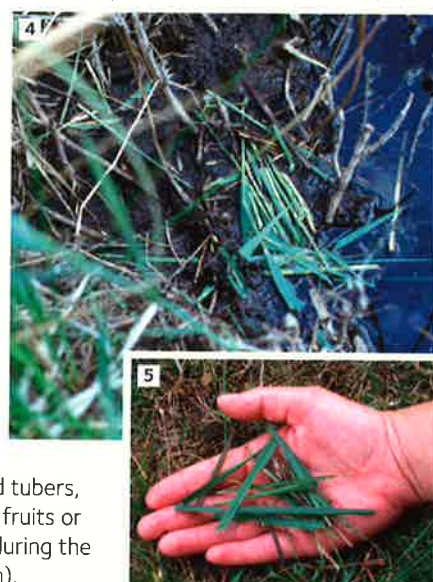
FEEDING STATIONS

Food items are often brought to favoured feeding stations along voles' pathways or at haul-out platforms along the water's edge. These show feeding remains as a neat pile of chewed lengths of vegetation (4). The sections are typically

up to 10cm long showing the marks of the two large incisors and are quite good fieldsigns of presence of water voles (5).

These chopped sections of vegetation are often taken into the burrow entrances by the voles (and laid up as stores along the tunnels or in chambers). By matching the pieces with the local plants growing on the bank the water vole diet can be determined.

Rat feeding stations may show collected and chewed tubers, piles of snail shells or fruits or even skinned frogs (during the frog spawning season).



BURROWS

Water vole burrow entrances are typically wider than high with a diameter of between 4–8cm (6,7). At the water's edge the entrances may occasionally appear larger due to erosion but the tunnel soon contracts down to the size of two fingers. Be aware that mole tunnels may be revealed by bank erosion and these can lead to confusion. Also sandmartin and kingfisher nest holes may resemble vole burrows, but these are largely constructed in the upper portion of an earth cliff



rather than close to the water. Field vole, bank vole and woodmouse dig smaller burrows of 2–3cm across. Rat burrows are slightly larger in size (8–10cm) than those of water voles but are best told by a fan-shaped spoil heap outside the entrances and well trodden runs that link them up. Rat burrows are usually dug higher up the bank than those of water voles, although some vole colonies have been taken

abundant they are. The Action Plan aims to protect existing populations and ultimately restore them from where they have been lost. Distribution surveys of water

voles are essential to describe the present distribution at the national, regional and local levels (Figure 4:1). Surveys for these purposes are necessary to maintain up-to-date



over by rats (the holes getting enlarged in the process). Externally, the burrow system appears as a series of holes along the water's edge, some at or just above the

water level on steep banks, some opening below the water line and others occurring within the vegetation up to five metres from the water (for access to food and for ventilation (8)). At the water's edge spoil excavated from the burrows tends to be washed away while those burrows opening high on the bank are probably dug from underground as no spoil can normally be found around them.

LAWNS

Around land holes, grazed 'lawns' can be found (8). These frequently occur when the female is nursing young and time away from the nest is kept to a minimum. The female grazes the vegetation short to the ground within easy reach of the hole; often by not fully leaving the hole and being wary to dart back should danger threaten.



NESTS

Both males and females take bedding underground to line nest chambers in the burrow system. Nurseries consist of a large ball of finely shredded grasses or reed and the chamber entrance may be plugged by the female with loose soil or grass. Where vegetation cover is dense and the water table is high, nests roughly the size and shape of a rugby ball can sometimes be found above ground, often woven into the bases of rushes, sedges or reed (9).

FOOTPRINTS

Although footprints may be readily found along the soft margin of a water course (of many species besides water voles) 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 (10). 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 (see illustration). Right and left tracks lie about 45mm apart and the stride averages 120mm.

Typically water vole tracks occur at the water's edge and lead into vegetation cover; rats on the other hand are more nocturnal and travel over more open ground under the cover of darkness.

RUNWAYS IN VEGETATION

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



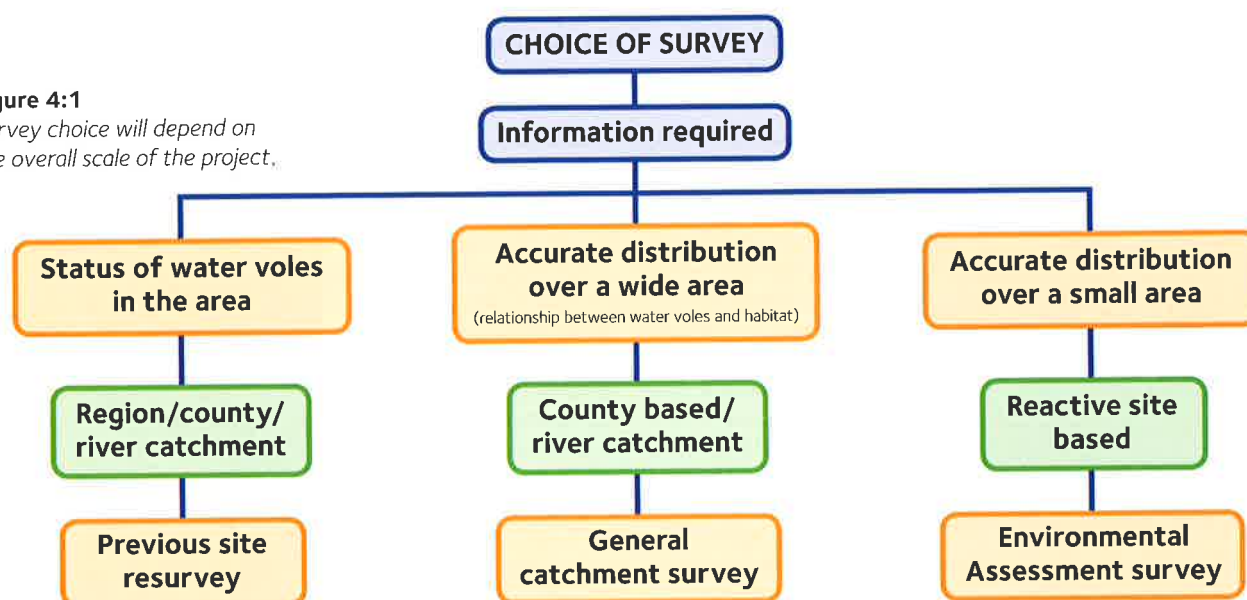
records and to monitor the overall effect of water vole conservation actions in the UK.

Environmental Assessment surveys are reactive surveys which must occur prior to any work that may

affect riparian habitat. These surveys provide data for assessing the impacts of developments, designing appropriate mitigation, and provide a baseline for monitoring (see Chapter 9).

Figure 4:1

Survey choice will depend on the overall scale of the project.



2 DISTRIBUTION SURVEYS

To monitor changing population and distribution trends a national sampling survey is in place, designed by the Vincent Wildlife Trust, that covers 2,970 survey sites throughout England, Scotland and Wales, from which future repeat surveys could measure any declines, increases or stability in the population (at both national and regional levels) as well as any changes in distribution. Such a survey is not designed to find every, or even most, water vole colonies, but to provide an overview of the trends affecting the national population. The interval between the first two National Surveys was seven years (the baseline was carried out in 1989–90 and repeated in 1997–98). Further details of the methodology used in the National Survey are given by Jefferies (2003) and Strachan and Jefferies (1993).

More detailed local surveys can be nested within the National Survey structure. Local surveys can incorporate a

greater frequency of sites along each watercourse, at 2km or 1km intervals or, better still, examine the entire system metre by metre. Water vole surveys can be overlaid onto River Corridor Survey maps where possible allowing habitat features to be examined in relation to water vole distribution. Local surveys identify gaps in the habitat and the level of fragmentation of the water vole population – and ultimately direct the focus of conservation effort.

The act of surveying for water voles does not require licensing in England or Scotland; however it is the view of the Countryside Council for Wales that the surveyor may trample water vole habitat and burrows and thereby cause disturbance. Each case will be need to be examined separately by CCW to see whether they require a survey licence to be issued.

3 REVISITING HISTORICAL SITES

One important starting point in determining the present whereabouts of water voles is to examine all the sites where the species had been previously recorded.

For a complement of previously known sites for water voles, old records and reports can be searched in order to extract accurately referenced and dated sightings of water voles. These include National Biological Network Records (usually based at local Biological Record Centres), Vincent

Wildlife Trust survey sites (National Survey – lodged with JNCC), Environment Agency biodiversity records, The Wildlife Trusts, BTO Waterways Survey, Local Mammal Reports and information from local naturalists.

Not only would this help focus survey effort, but the proportion of sites still supporting water voles would indicate the severity of any local decline.

Each site should be surveyed according to the field

techniques described below, recording data on standard recording sheets for each 500m searched. Where water voles are found to survive, the extent of the colony upstream and downstream of the site should be determined where possible.

The UK Biodiversity Action Plan process has required that national aims and objectives are met through local initiatives that arise out of local Biodiversity Action Plans. These focus their delivery to specific areas, such as whole Counties, defined administrative areas, whole or part river catchments or specific conservation sites. Published actions and target dates for their implementation, have given the impetus for much detailed survey work to be carried out for the water vole, establishing local baseline surveys through which to monitor the success of the

various local conservation initiatives.

Many County-based or river catchment-based surveys have now been completed, often in great detail (such as contiguous 500m stretches along a waterway). Collectively, this detailed survey effort has been immense involving several hundred thousand mapped and recorded sites across the UK mainland together with the whole island surveys of Anglesey and Isle of Wight. Much of this survey work has been commissioned or co-funded by the Environment Agency, English Nature, Countryside Council for Wales, Scottish Natural Heritage, British Waterways and the public Water Utilities (such as Thames Water, Wessex Water, Severn-Trent Water etc.). The Wildlife Trusts in each County, together with a few professional survey teams have carried out the work.

4 GENERALIZED CATCHMENT SURVEY

Catchment-based surveys provide a regional overview, which ignore the artificial constraints of political boundaries but are determined by local geography and hydrology – more natural systems that have a direct bearing on riparian mammal species.

Hydrometric areas may be surveyed in their entirety, metre by metre, to give a complete and accurate picture of a species' distribution and so demonstrate the integrity of the riparian habitat corridor. It is important that the survey includes ditches and small backwaters off the main river channel, as well as ponds, lakes, flooded gravel pits, reservoirs and lochs. Where they occur, canal sites should also be included as they can provide ideal habitat for the species.

The approach to carrying out a generalized catchment-based survey is one of attempting to cover as much of the catchment as possible in a systematic way. Where possible the main watercourse, its tributaries and headwaters should be surveyed with additional sampling of a series of adjacent 1 km squares to provide information on field

boundary ditches and static water bodies. Urban watercourses may be particularly fruitful for locating water voles since they may provide a refuge area from many predators of the wider countryside. Information on riparian habitat as well as information on the presence of riparian mammals should be gathered simultaneously.

The steps involved in selecting which areas to survey are as follows:

- Establish the broad outline of the catchment from Environment Agency catchment maps.
- Overlay the catchment area on to Ordnance Survey 1:25,000 maps (Pathfinder series).
- Mark areas on the map which may contain possible water vole habitat, progressing through each of the catchment 1km squares by:
 - (i) Delineating all water courses, water bodies and wetland areas within parcels of land that suggest flat or gently sloping gradient (interpolates between the drawn 10m contour lines should be greater than 4mm apart on the map).

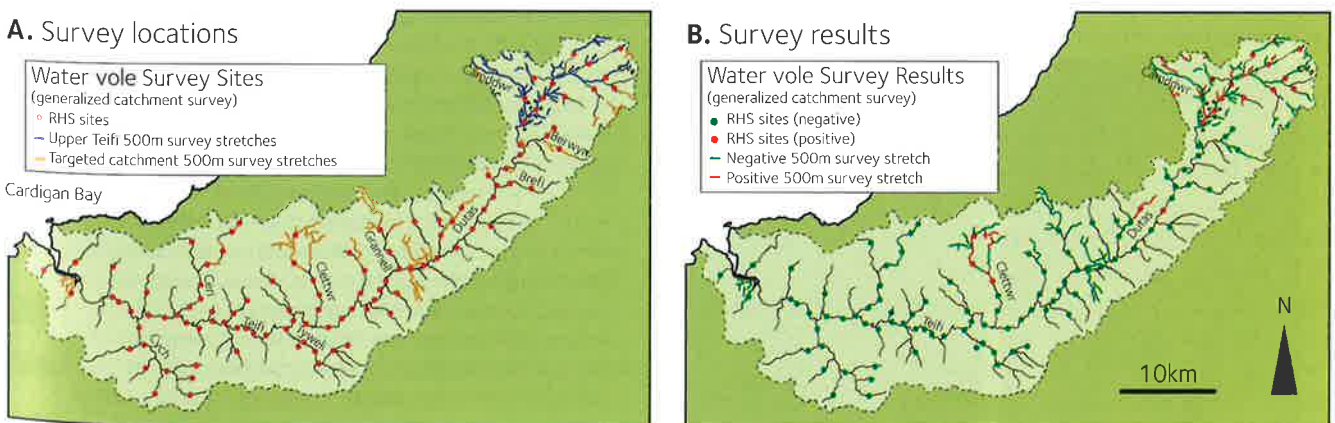


Figure 4:2

Generalized catchment survey of the River Teifi, Wales: **A.** location of survey sites showing complete systematic search of the upper catchment and river habitat survey sites in the remaining part; **B.** results indicating the fragmented distribution of water voles surviving in 1998 (source: Macdonald and Strachan, 1999).

(ii) Where the gradient of the landform is very steep (with water falls, etc.) or the water course is very rocky by nature, then survey sites may be best sampled at a frequency of 2km intervals rather than intensively searched.

(iii) Exclude water courses with mature forest (broad-leaved woodland and conifer plantation) on both banks.

(iv) Exclude salt marsh, tidal estuaries and coast.

(v) Include isolated large ponds, lakes, moats and other static water bodies that may support water vole populations.

- Number the 1km squares which contain more than 1000m total length of possible water vole habitat and record their grid references.

- Designate 500m sections of waterway for field survey within each 1km squares by the following methods:

(i) Select approximately one third of the upper catchment for the complete systematic search of contiguous 500m sections to provide continuous metre by metre information along all the suitable waterways and the isolated water bodies and wetlands out-with the river course. This approach allows for the majority of the uppermost water vole colonies to be identified and allow for any patterns of fragmentation to be interpreted. If possible the water vole distribution should be overlaid on to any existing River Corridor Survey habitat maps where appropriate and so help to interpret any relationship with available habitat, riparian management and adjacent land-use.

(ii) For the remaining catchment, sample the statutory main river and tributaries according to River Habitat Survey site

selection recommendations. Starting from the tidal reaches, mid-point grid references are identified at 2km intervals (using a map-wheel), each site being the standard 500m length.

(iii) Using the results found in both (i) and (ii) above, target a random sample of the remaining 1km squares with over 1000m length of possible water vole habitat (this method should be used where time constraints or resources preclude a more detailed investigation).

(NB: where 1km squares may contain a large amount of possible water vole habitat and distinct differences in available water body types, the sampling intensity in those squares should not exceed 2000m of riparian bank length, but never the less be proportional to availability of waterway types).

- For each 500m section searched, standard field survey techniques should be followed as described in Box 4:B.
- Ponds and still waters may act as refuges for water voles where riparian habitat has been degraded. Where these sites can be surveyed the total perimeter should be searched and the distance recorded on the survey form.
- For each 500m section, survey data should be recorded on the standard survey recording sheets as described in Box 4:B below.
- Each site should be searched for water voles over a distance of 500 metres along the watercourse bank (one bank only). The field survey can usually be divided into 250m upstream and 250m downstream of the mid-point grid reference. Approximately 45–60 minutes should be spent at each site.

5 UPLAND SURVEY STRATEGY

Due to the additional difficulties of working within the terrain of uplands areas in the UK, the lowland survey strategy described would be inefficient in these habitats. In these cases a simple selection strategy makes the most efficient use of time.

- Strachan and Jefferies (1993) concluded that water voles are not to be found on the rockiest, nor fastest flowing streams (i.e. steep gradient) and these areas should be omitted from the survey.
- Identify the parts of the study area that consist of mainly peatland, and with gently sloping or level ground (less than three percent gradient). These areas are those in which water voles were most likely to be found and thus form the basis of the survey. Maps can be easily generated in GIS to help focus the survey effort.
- Within this patchwork of 'suitable' habitat, randomly select 500 metre stretches of waterway for survey in the same manner as for lowland habitats.

BOX 4:B GENERAL METHODOLOGY FOR

- Field work should be confined to the optimal period of finding water vole breeding territories, marked by latrines (late April through to early October).
- Survey only needs be conducted from one bank of a given length of waterway. If, however, one bank has unsuitable or extremely poor habitat, survey should be conducted from the bank with the best vegetation. Whilst surveying, any obvious field signs on the opposite bank should be noted, through binoculars if necessary.
- For 500m sections within a generalized catchment survey, signs of water voles are recorded on standard survey forms (see Figure 4:3 and Appendix 3) at every site.
- For Environmental Assessment surveys, the entire site should be split into 50m–100m lengths, preferably with a GPS grid reference for the start and end of each length, and the field signs recorded for each section.
- For either survey type, the number of each type of water vole field signs (latrines, burrows, feeding signs etc., below) should be ranked **abundant**, **frequent**, **scarce** or **none** for each section surveyed.
- Field signs to record include (in approximate order of usefulness as an indication of occupation and for

6 ENVIRONMENTAL ASSESSMENT SURVEY

Environmental Assessment is a process to ensure that the environmental impacts of potentially damaging schemes are identified before a decision is taken on whether a proposal should proceed. This is discussed in more detail in Chapter 9. This allows the best practical environmental option to be selected at an early stage in the planning process. Projects can then be designed or modified to avoid or minimize potentially adverse impacts on habitats or species.

Information on water voles should be collated through both a desk-based review of existing data, for the site and surrounding area, and a field survey. The study area for both types of survey, and the level of detail required will be dependent upon the type and scale of any potential impacts.

6.1 DESK STUDY

Any existing information on water voles within a 2km radius of the site should be collated and assessed through a desk study, by contacting relevant organizations and individuals, as described under 'Revisiting historical sites' above. This information will assist the assessment of the level of 'importance' or 'value' of any water vole populations affected, and inform the identification of impacts beyond the proposed development site, such as population fragmentation (see Chapter 9). In addition, data relating to water vole populations in the local area may also assist in the selection of mitigation options. In

certain cases, for example for large schemes with a major impact on water voles, or for schemes requiring the translocation of individual animals, it is likely that the study area would need to be extended to a 5km radius.

6.2 FIELD STUDY

A field survey will always be required for any proposed development affecting habitat potentially suitable for water voles. Such surveys should include all areas of habitat suitable for water voles which could be directly affected by the proposals, and should extend some distance from the site boundaries to inform impact assessment and mitigation (see Chapter 9). The distance from the site which will need to be surveyed in detail will be dependent upon the nature and magnitude of potential impacts. For a small-scale development affecting a 50m length of habitat, it would be appropriate to extend the survey 50m upstream and downstream of the site boundaries. For large scale developments affecting several hundred metres of habitat, and which could result in population fragmentation as well as habitat loss, it would be appropriate to extend the survey for up to 500m upstream and downstream of the site.

Field surveys for development projects should initially aim to confirm the presence or absence of water voles from the site and the surrounding area. If water voles are present, the survey will have several further aims:

1) To assess the status of the population and the

SITE-BASED WATER VOLE SURVEY

density estimates):

- Latrines, showing discrete piles of droppings;
- Feeding stations or chopped vegetation;
- Tunnel entrances above and below water with a cropped 'garden' or 'lawn' around the tunnel entrance;
- Paths and runs at the water's edge, runs in the vegetation and footprints in the mud;
- Sightings, sounds of entering water.
- The best index of abundance is the number of latrines counted. This provides an indication of relative density of water voles, based on the presence of breeding individuals (visiting and maintaining latrines) at that site and is useful for comparison between sites and future surveys. Very approximately six latrines equate to one female territory, and therefore one 'breeding unit', although this may vary markedly between habitats (see *Interpreting the survey results*, below).
- For either survey type, habitat for the site as a whole should be recorded on the standard survey forms (see Figure 4:3 and Appendix 3).
- The presence/absence of mink, otter and brown rat signs at each site should also be recorded, noting the relative abundance of footprints and droppings located along the 500m distance.

These should be marked on the sketch map together with the position of the water vole signs.

- Supply your survey records (positive and negative) to the local records centre, local Wildlife Trust, Environment Agency and SNCO.



Water vole surveyors at work in contrasting habitats.

- proportion of the population likely to be affected;
- 2) To assess the value of the habitat that would be affected, as well as that adjacent to the site, and provide a comparison between the two;
 - 3) To map the relative value of the habitat and the relative density of water voles at a scale which could inform either the location of the development to minimize impacts; and
 - 4) To provide a baseline for monitoring the success of any mitigation measures implemented.

The scale at which habitat suitability and water vole fieldsigns need to be mapped will therefore be dependent upon the potential value of this information. For example, a development which would require the diversion of several hundred metres of a watercourse, and where there is no scope to alter the location of the proposals, should assess the value of the habitat and the density of fieldsigns within the affected section and adjacent sections (of a similar length to the affected area). In such cases, there would be little point in mapping each individual burrow or latrine. However, for a pipeline crossing of a watercourse, where there would be scope to alter the location of the crossing, it would be appropriate to map both fieldsigns and suitable habitat in great detail within the entire length of watercourse which could potentially be affected. In such cases, there may be considerable value in mapping each individual burrow and latrine.

Field surveys for Environmental Assessment purposes can only be reliably undertaken during the period mid-April to September. Surveys undertaken outwith this period can

only confirm the presence of water voles and not absence; they should also not be used as a means of informing impact assessment or mitigation options except in very straightforward cases (such as where the affected habitat is clearly unsuitable or very poor in comparison with adjacent areas). Water voles can react quickly to slight changes in habitat suitability, such as drying out of a wetland area or watercourse, management works, or vegetation growth. It is therefore advisable that any Environmental Assessment is based on field surveys conducted at either end of the season (i.e. one visit in mid-April, May or June, and a second visit in July, August or September). Surveys undertaken immediately following management works can be misleading and should be avoided.

Where insufficient desk-study information is available on water voles in the surrounding area to inform the assessment of impacts or the appropriate mitigation, it may be necessary to undertake surveys of the wider area around the site. These surveys are likely to comprise only a 'spot-check' to record the presence or absence of water voles, approximate density of animals and suitability of habitat. For developments which have the potential to result in the fragmentation of water vole populations, or where translocation of animals is likely to be required, it is unlikely that sufficient desk-study information will be available and therefore an additional survey of the wider area is likely to be required. Surveys of the wider area should take place in all areas of suitable habitat where access is available within a radius of approximately 5km.





7 RECORDING WATER VOLE HABITAT INFORMATION

This can be recorded in two ways: by filling a series of tick-boxes on a simple pro-forma that summarizes the habitat features over the length surveyed, and by drawing an annotated map of the site (a simplified version of the River Corridor Survey and its associated symbols; Figure 4:3 shows a completed recording form). Where copies of River Corridor Survey maps are available depicting each 500m section of the waterway, the precise location of the fieldsigns of the riparian mammals can be marked directly onto them.

- **Site details:** it is essential to provide accurate Ordnance Survey grid reference coordinates for the mid-point of the survey. Each site should be named, with that of the watercourse and any other local landmark (such as a farm or village).
- **Habitat:** tick the relevant box that best describes the watercourse or water-body.
- **Shore/bank:** tick more than one box if required, that best describes the predominant bank substrate.
- **Bordering land-use:** tick more than one box if required and mark symbols on the accompanying map. Note whether the banks are fenced or not and whether the site is grazed by horses, cattle or sheep. Record where banks show extensive poaching and trampling.
- **Vegetation cover:** for each of the vegetation types, estimate the overall amount of cover provided for the 500m section. Record them using the following DAFORN categories:

Dominant	81–100%
Abundant	61–80%
Frequent	41–60%
Occasional	21–40%
Rare	1–20%
None	0%

- **Disturbance:** note disturbance at the site from human recreation (boating, angling, dog-walking etc.) and any recent river engineering or bank maintenance work.
- **Bank profile:** estimate the overall angle of the bank from the river (mark any cliffs or undercut sections on the map). If possible determine any previous channel realignment, resectioning or bank reprofiling.
- **Depth:** estimate the overall average midstream depth, but note any deep pools on the map.
- **Width:** estimate the width of the watercourse in metres. A useful guide is to imagine how many tall people (2m) could lie across the river head to toe.
- **Current:** how fast is the watercourse flowing? Estimate the speed by watching the midstream passage of a small stick floating on the surface.
- **Wildlife information:** tick the relevant boxes of the fieldsigns found and provide counts of latrines, burrows and feeding stations over the 500m length.
- **Sketch map of site:** draw a representation of the watercourse and mark on important features such as pollarded trees, extensive areas of emergent vegetation and areas of scrub. Select symbols from the sketch map prompt on the sheet and use the appropriate codes to describe adjacent land-use. Mark important areas of water vole activity with target notes (mink and otter signs can be similarly marked).
- **Additional comments:** describe any evidence of pollution at the site and information on water level management. Note whether any known water abstraction occurs that may affect the site. Note level of flood debris position from winter flooding (trash line above current water level) and any signs of summer drought/drying out entirely. If water voles are present note whether the colony extends further upstream or downstream.

WATER VOLE SURVEY FORM

BACKGROUND INFORMATION

 Site name/river **Eastern Yar, Alverstn, I.O.W.**

 Site number **105**

 10km square **SZ58**

 Grid ref **SZ 577855**

 County **Isle of Wight**

 Water Authority **Southern**

 Recorder **Rob Strachan**

 Date **30 / 03 / 1997**

HABITAT INFORMATION (mark features on map)

Survey distance

0.5 km

Habitat

- ☐ Ditch
☐ Dyke
☐ Gravel pit
☐ Pond
☐ Lowland lake
☐ Upland loch
☐ Reservoir
☒ Running water
☐ Marsh/bog
☐ Canal

Shore/bank

- ☐ Boulders
☐ Stones
☐ Gravel
☐ Sand
☐ Silt
☒ Earth
☐ Rock cliffs
☐ Earth cliffs
☐ Canalized
☐ Poached
☒ Reinforced (man-made)

Bordering land use

- ☐ Upland grass
☒ Permanent/temporary grass
☒ Mixed broadleaf woodland
☐ Conifer wood
☐ Peat bog
☐ Arable crop
☐ Salt marsh
☐ Urban/industrial
☐ Park/garden
☐ Heath
☐ Fen
☐ Cattle/grazing
☐ Bank fenced?

Vegetation (DAFORN)

- ☒ Bankside trees
☒ Bushes
☒ Herbs
☒ Submerged weed
☒ Reeds/sedges
☒ Tall grass
☒ Short grass

 Disturbance: **2**

 Footpath &
anglers

Bank profile

- ☐ Flat < 10°
☐ Shallow < 45°
☒ Steep > 45°
☐ Vertical/undercut

Depth

- ☐ < 0.5m
☒ 0.5–1m
☐ 1–2m
☐ > 2m

Width

- ☐ 1m
☐ 1–2m
☒ 2–5m
☐ 5–10m
☐ 10–20m
☐ 20–40m
☐ > 40m

Current

- ☒ Slow
☐ Rapid
☐ Sluggish
☐ Fast
☐ Static

WILDLIFE INFORMATION

Water voles

- 2** Sightings (count)
22 Latrines (count)
36 Burrows (count)
☒ Footprints
☒ Pathway in vegetation
☒ Feeding remains
☐ Cropped grass around tunnel entrance

Rat None

- ☐ Sightings
☐ Droppings
☒ Footprints/runs

Otter None

- ☐ Sightings
☐ Droppings
☒ Footprints/runs

Mink None

- ☐ Sightings
☐ Droppings
☒ Footprints/runs

Other wildlife

- ☐ Kingfisher
☐ Heron
☒ Coot
☒ Waterfowl
☒ Moorhen
☐ Dipper

 Identified plants from feeding remains: **Carex paniculata, Glyceria, Ranunculus, Salix spp (flower buds)**

SKETCH OF SITE – vole activity indicated (if any)

KEY TO SYMBOLS

(mark route surveyed and direction of flow)

Mature trees		ADJACENT LAND-USE CODES Broadleaved wood BW Conifer plantation CP Moorland/heath MH Rough pasture RP Wetland WL Improved grass IG Tilled land (crop) TL Suburban/urban devel. (inc. gardens) URB
Over-hanging branches		
Fallen tree		
Exposed roots		
Pollarded tree		
Sapling		
Scrub		
Hedgerow		
Fence		
Reed/sedge bed		
Flood bank		
Artificial bank		
Earth cliff		

ADDITIONAL COMMENTS:

Water level management
 Signs of drying out
 Flood debris position
 Evidence of pollution

Weir allows for stable water condition throughout the year.

Adjacent wetland has pool and greater tussock sedge - many signs of water voles.

Water voles eating greater tussock sedge, reed sweet grass, water crowfoot, water cress, willow.

Figure 4:3

An example survey form completed during a survey of the Isle of Wight.

8 INTERPRETING THE SURVEY RESULTS

Survey results need to be put into context. Background information on relative status and distribution is therefore paramount in determining the importance of a particular site and the extent of the water vole colony it supports. The two National Surveys (published by the Vincent Wildlife Trust in 1993 and 2003 respectively) provide an overview at both national and regional levels.

On current information (suggesting a catastrophic national loss of water vole sites in Britain) there are strong conservation arguments to retain every large water vole colony located.

The number of water vole latrines counted at a site (during the breeding season) gives an indication of the strength of the water vole colony. Morris *et al.* (1998) published a predictive equation that describes the relationship between water voles and latrine numbers (based on intensive water vole trapping along stretches of two Yorkshire rivers), $y = 1.48 + 0.683x$, where y = water vole numbers and x = number of latrines. This equation is unlikely to provide a robust estimate in all habitat types. This notwithstanding, there appears to be a good

correlation between maintained large latrines and the number of breeding females at a site: very approximately six latrines per adult female. This figure too may vary for differing types of waterway and also for different months of the year. Latrine counts, therefore, provide a very useful index of water vole activity, the larger and more robust populations showing a large number of closely packed latrines. However, if a precise numerical estimate of water vole numbers is required the only accurate method is via capture-mark-recapture methods.

When water vole populations are small and fragmented there appear to be fewer maintained latrines, but feeding signs and burrows (and even sightings) confirm their presence. These sites may be equally important as part of a bigger collective population over the whole river catchment, where the survival of each site increases the likely survival of the neighbouring site.

10 WATER VOLE CAPTURE

The provision of full protection for water voles under Section 9 of Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) in 2008 means that any attempts at catching this species will require licencing from the appropriate Statutory Nature Conservation Organization (see Chapter 2).

In any live-capture procedure, there is a potential to compromise the welfare of trapped animals. Live trapping should therefore only be conducted by experienced personnel. Capture of water voles may be necessary for detailed scientific study, for an accurate population census, or in extreme cases, if the population requires removal from a site threatened with destruction (see also Chapter 9). For scientific studies and population censusing, the capture will most likely be part of a Capture Mark Recapture (CMR) study, in which individuals are captured, marked and then released over a period of some days. For water vole relocation or translocation, individuals will be removed from the site on capture.

Water voles are relatively easy to capture, especially during the breeding season when they are frequently patrolling their home range. The key to a successful trapping exercise is the location in which the traps are placed and the use of a suitable bait. It is important that any water vole capture is conducted by experienced personnel, since the potential for compromising the welfare of many individuals is high if live-capture is not conducted in an appropriate manner.

Many types of traps are available for capturing water voles, and some of these are listed in Appendix 1. In general, the larger the trap the better since this will allow the provision of good quantities of food and bedding. Sherman traps (<http://www.shermantraps.com>) have the advantage that they can be folded flat for ease of transport, but unless the XLF15 (15 inches long, with galvanized steel treadle and door) are used, may limit the amount of bedding that can be provided. Other designs incorporate a separate nest box which allows plenty of room for bedding and food, and can make transport of animals easier over short distances. The disadvantages are that these designs can be bulky and fiddly to set. In general designs with nest boxes or which allow the addition of lots of bedding and food are preferable, but logistical factors for a given project may limit trap choice to those which are easy to transport and handle in numbers.

10.1 WHERE AND HOW TO PLACE AND SET THE TRAPS

Between April and October, latrines are regularly visited by resident water voles, and by placing a trap immediately beside a latrine, success is almost guaranteed.

- Trapping should only be conducted by experienced personnel. Trapping has large potential to compromise the welfare of individual animals and to lead to mortality. Moreover, incorrect trapping will result in a lowered capture success which will give biased survey results, or,