

How To Do A Water Shrew Survey



Sussex
Wildlife Trust

The Water Shrew (*Neomys fodiens*)

There are three species of shrew native to the British mainland:

- Water shrew (*Neomys fodiens*)
- Common shrew (*Sorex araneus*)
- Pygmy shrew (*Sorex minutus*)

Neomys fodiens (the European water shrew) is the largest of the British shrews.



Water shrew © G. Kinns

How to identify a Water Shrew

- Water shrews are semi-aquatic and use water for essential elements of their survival – in this case, feeding.
- Adult water shrews reach around 15cm in length (Head/body: 67-96mm: Tail: 45-77mm (Churchfield, 1986).
- Unlike the other two shrews, the tail is almost as long as the body.
- Water shrews can weigh between 8 - 23g with an average of 12 - 18g. Pygmy and common shrews generally weigh less than 12g (Perrow & Jowitt, 2003).
- Water shrews have velvety, black dorsal (back) fur and pale, silvery white ventral (stomach) fur.
- The fur is denser than in other shrews, efficiently insulating them against cold and wet.
- They have hidden ears visible as tufts of white hairs, that they can close under water (Macdonald and Barrett, 1993).
- They have red tipped teeth and their saliva is slightly venomous and is used to stun larger prey.
- The feet have a fringe of stiff, silvery hairs which help them to swim, and the tail has a hairy 'keel' on the ventral (lower) surface (Carter & Churchfield, 2006).
- They possess sensitive, mobile whiskers which they use to detect prey whilst swimming. (Churchfield, 1986).

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Water shrew – UK distribution

Water shrews are widespread and have been recorded throughout Britain except for some parts of Northern Scotland, however they tend to be localised and sporadically present (Harris *et al.* 1995). In 2003, the Mammal Society carried out a UK wide water shrew survey. The survey showed that water shrews appear to be relatively common and widespread, although possibly locally declining.

Why survey for water shrews?

Despite the UK water shrew survey, relatively little is known about water shrew presence, abundance, habitat and food preferences. In Sussex, prior to 2003, only 71 sightings of water shrew had been recorded at the Sussex Biodiversity Record Centre (www.sxbrc.org.uk). Recent surveys have significantly increased the information that we have, but there are still huge recording 'gaps' in the County and a serious lack in the quality and continuity of water shrew recording. There are concerns that habitat loss and pollution is affecting water shrews at a local scale but they are assumed to be locally frequent and common. With your help we can learn more about where water shrews live in Sussex and how they are affected by changes in wetland habitat.

When to survey for water shrews

- In summer (June – August) population densities are highest and their presence/absence should be easiest to establish.
- In winter (Nov - Jan) density/activity is lower, and water shrews are more likely to inhabit optimum sites, and to be attracted to baited water shrew tubes as an extra food source.
- Several authors have observed that water shrews are scarce during the Jan - March period (including Churchfield, 1984)

In Sussex, Southgate *et al* (2006) and Scott *et al* (2005) observed higher success with shrew tubes during winter. This may be because Sussex tends to experience dry summers, and shrew tubes provide an easy food source in winter.

What is the recommended method of surveying for water shrews?

Water shrews are elusive, difficult to trap and often leave little evidence of their presence (Churchfield *et al*; 2000). Trapping is also not recommended as the high metabolism of shrews makes them extremely vulnerable to starvation, cold, wet and shock when in traps. Trapping for shrews also **requires a general licence** from www.gov.uk and traps need to be checked every few hours even at night.

The bait tube method makes use of the fact that shrews will usually investigate novel objects and defecate on them to mark them territorially. Tubes are non-invasive and do not cause stress to the animals. The high metabolism of water shrews also means that they defecate whilst eating the bait in the tubes. Water shrew scats can then be analysed under a microscope as they show distinctive signs of the aquatic invertebrates that water shrews eat. Bait tubes can't tell you how many individuals are on a site, but are a good way of establishing water shrew presence/absence.

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How to make and place bait tubes for Water Shrew surveying

- Cut 40 mm diameter white plastic pipe (available from plumbing centres and DIY stores) into 160 - 200 mm lengths to accommodate water shrew's body and tail.
- Bait the tubes with blow fly pupae/casters (*Calliphora vomitoria*) available from fishing tackle shops. Casters can be frozen to store them and then placed in the tubes from frozen.
- Place approximately 10-20 casters per tube in the centre of the tube.
- Place a small square of muslin over one end of the tube and hold in place with an elastic band. This encourages shrews to enter the tube fully and leave scats during incidental feeding, although occasionally they eat through the muslin end of the tube to obtain casters. Some water shrews leave scats on the top of tubes, be aware of this when collecting tubes.
- Place ten bait tubes at approximately 10m intervals along a 100 m transect at each survey site.
- Place tubes roughly within 2m of the water's edge unless the site floods regularly (look for tide/brash marks).
- Place tubes level and flush with the ground at both ends, and adjacent to small mammal runs where possible.
- Place tubes within/under vegetation or leaf litter, or cover them with grass or leaves if site is open and tubes are exposed.
- For ease of collection, number each tube with an individual code in permanent marker pen.
- Tubes are easily lost in vegetation so mark tube location with coloured tape/string to ensure ease of collection (make sure you remove markers when you collect tubes).
- Leave tubes in situ for 10 - 14 days.
- Separate each survey site by a minimum of 300m and preferably at least 500m to ensure that tube territories are not being used by the same shrew.

Make sure you have permission to access the land from landowners and site managers, that you have carried out an appropriate risk assessment and that if working by water you adhere to good health and safety codes of practice and are not lone working.



Water Shrew Tube in situ

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Limitations of bait tubes

Where no scats are found in a tube, water shrews are assumed to be absent but be aware that this may not actually be the case. It is also rare to detect water shrew presence away from water using traps or tubes, even though water shrews wander frequently in the wider countryside.

Likely places to find water shrews



Reed and tussocky vegetation with a thick litter layer
A likely habitat to find water shrews © S McIntyre

- Research has shown that water shrews like sites with high reed cover and a good plant litter layer at ground level. Tussocky sedges or grasses are also favoured, they are more frequently present where there is good water quality (especially in summer), they appear to prefer water less than 2m deep and they require sites with a high diversity of aquatic invertebrates.

- Water shrews appear to be absent from places with extensive tree cover/leaf litter, bracken, high water temperatures, intensive grazing/bankside vegetation cutting, and highly fluctuating water levels.

They have been found in Sussex on ponds, lakes, reservoirs, rivers, streams, ditches, canals, vegetated shingle and (rarely) heathland (Southgate & Scott '06).

Collecting shrew tubes

- Place each collected tube in an individual plastic bag showing the date, site code & tube number
- Leave scats to air dry in open bags
- When dry, scrape contents of each tube into a separate petri dish or similar, marked with site code, tube number and date
- Remove any obvious pieces of 'debris' (leaves, mud, snail shells) with tweezers, making sure that no scats are attached to them.
- Once dry, scats are ready for analysis using a binocular microscope (G10X22 x 4 magnification)
- Remember to remove markers where you left the tubes

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Scat analysis

Water shrew scats are a similar size to mouse (rodent) & common shrew scats. The following information should help you to distinguish between water shrew scat and other small mammal scat when processing scat from tubes :-

- Rodent scat becomes very hard when it is dry and cannot be crushed easily
- Rodent scat is usually black/dark and smooth, and tends to be obviously pointed at one end
- Common shrew and water shrew scats will crumble when pressed and have a much rougher texture than rodent scat
- Common shrew scats are often a lighter brown colour than water shrew scats and contain remains of earthworm, spider and beetle
- Water shrew scats tend to be silvery due to the presence of aquatic invertebrates in their diet
- Water shrew scats are often bigger than common shrew
- You may find a lot of snail faeces in tubes (long, thin and wavy!) - if so, discard it.
- Discard any tubes which have no scats in which are obviously not water shrew (but make sure you record them as a negative result)



Common Shrew Scat



Rodent Scat



Water Shrew Scat

- Scats which are not obviously water shrew can be wetted with a drop of water and broken up to expose prey fragments for further analysis under a microscope (See Carter and Churchfield, 2006 for a prey remain identification guide)
- To ensure consistency, all samples should be cross checked by one other person where possible
- Recording presence or absence of water shrews at a site is enough. However, any additional information is useful. i.e. vegetation type/coverage of the site, dimensions of watercourse, depth of water, presence of other species such as mink etc).

Recording positive & negative Water Shrew records

The easiest way to record wildlife sightings is using i-record which feeds into a national database. www.brc.ac.uk/irecord. If it's a negative record (where water shrews are absent) state this clearly in the comments box. Alternatively, record your data clearly in a spreadsheet with your name, date, site name and tube locations and send to Sussex Biodiversity Record Centre www.sxbrc.org.uk

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Wildcall, Wildlife Advice line
www.sussexwildlifetrust.org.uk/discover/wildlife-advice
01273 494777

Shrews: Licence to trap them
Natural England / Defra
www.gov.uk/government/publications/shrews-licence-to-take-them

The Water shrew Handbook
Phoebe Carter / Sara Churchfield

References & Further Reading

- McDonald & Barrett. 1993.
- Perrow & Jowitt. 2003.
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- Southgate & Scott. 2006
- Carter and Churchfield. 2006.
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Water Shrew © The Mammal Society

Sussex wetlands project promotes the sustainable management of rivers and the restoration of wetland habitats for people and wildlife

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