

ECOLOGICAL SURVEY

Small Mammal Survey at Centenary Riverside,
Rotherham

9th to 11th September 2012



Common Shrew at Centenary Riverside (Photo Julie Riley)

September 2012

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1 INTRODUCTION

1.1 Site

Centenary Riverside is an urban wetland Nature Park, part of a pioneering flood alleviation scheme on the banks of the River Don. Created on the site of a former steelworks, it covers 4.5 hectares consisting of planted wet woodland, dry woodland, wildflower meadows and naturally regenerated wetland habitats. It is centred on grid reference SK 420 921 in the Templeborough area of West Rotherham which is a mixed commercial and business area, not far from the town centre. The site is approximately 1km from junction 34 on the M1 motorway.

1.2 Aims of study

A small mammal survey was carried out at Centenary Riverside, with specially-designed Longworth traps being placed across the site. The survey was designed to give baseline information about the small mammals using the site, so traps were placed across the site, including on the wildflower bank, the bank leading down to the railway line, and around the perimeter of the ponds. The intention was to identify the presence or absence of small mammals in each of these areas.

In order to give the mammals time to become familiar with the presence of the Longworth traps, and to maximise capture rates, the traps were set on a Saturday afternoon and then checked morning and evening over three nights, giving a total of 6 checks. 14 traps were used initially although two were removed part way through the survey.



Setting a Longworth trap

2 METHODOLOGY

2.1 Field survey

The survey was carried out using Longworth mammal traps, using Natural England's general licence, and followed the Mammal Society's best practice guidance as laid out in the booklet ***Live Trapping Small Mammals: A Practical Guide*** by J. Gurnell and J.R. Flowerdew (London: Mammal Society, 1990). The surveyors found the short Mammal Society videos available on YouTube very helpful, both in viewing how to set the traps, and in how to identify the animals caught.

Longworth traps are made of aluminium and are in two parts; a tunnel with a trap mechanism and locking door, and a nest box which is filled with nesting material (hay, shredded paper) and bait (dried mouse food, fresh chopped apple for moisture, and live casters to feed any shrews that may be trapped).

The reserve manager had asked for traps to be placed in various locations across the site (see Figure 1 below for the trap locations). Originally this included 4 traps to be placed along the wildflower meadow bank running NE to SW across the centre of the site; unfortunately, the survey coincided with the start of the annual meadow cut, so the plans had to be slightly changed on the day of setting the traps, and two of the traps were removed on Monday morning in anticipation of the strimming work continuing. 14 traps were available and were placed as follows:

Traps 1 – 4 were located at the northeastern and northern edges of the site, on the downslope of the bank leading down to the railway line and to Don Island. Traps were placed in tall ruderals or scrub, along edge features such as woodpiles and the railway fencing where possible, to take advantage of small mammals' preference for travelling along edges.

Traps 5, 6, 8 and 12 were placed on the top of and partway down the large wildflower bank that runs from southwest to northeast across the site. As half of this bank had already been strimmed, most of the traps were placed towards the southwest. Traps 5 and 12 were placed under small trees/shrubs whereas traps 6 and 8 were in open grassland with no features. In these cases the surveyors tried to identify runs in the grass and place the traps along or across these. Traps 6 and 8 were removed on Monday morning in anticipation of the bank being strimmed, so only had 4 checks instead of 6.

Traps 7, 9 – 11 and 13 – 14 were located around the perimeter of the ponds area. The habitats varied but included large patches of redleg and asters, areas of reed canary grass and muddy patches under alder and willow. None of the traps were placed immediately adjacent to water, partly due to accessibility issues but also in case of heavy rain and the risk of floodwaters rising.

The traps were pre-filled with bedding and dry bait and taken on-site at lunchtime on the 9th September. Chopped apple and carrot and live casters

were added on site. To ensure the traps could be easily found, their locations were marked with a cane and red tape, and their GPS position was recorded.

Each trap was positioned carefully at a downward angle to make sure water could not collect at the end of the nest box, and the tunnel entrance were level with the ground as small mammals do not like to climb up into holes. Each trap was covered with vegetation to minimise temperature variation. The traps were then set so that they would be triggered if an animal entered the nest box. All traps had been set by 1:00 pm.

The traps were then checked morning and evening starting at 6:30 pm on Saturday evening, i.e. every 12 hours – a total of 6 checks altogether. The last check was on Tuesday 11th September at 6:45 am, at which point the traps were dismantled and removed.

The photographs below show the habitats in which the traps were set up.

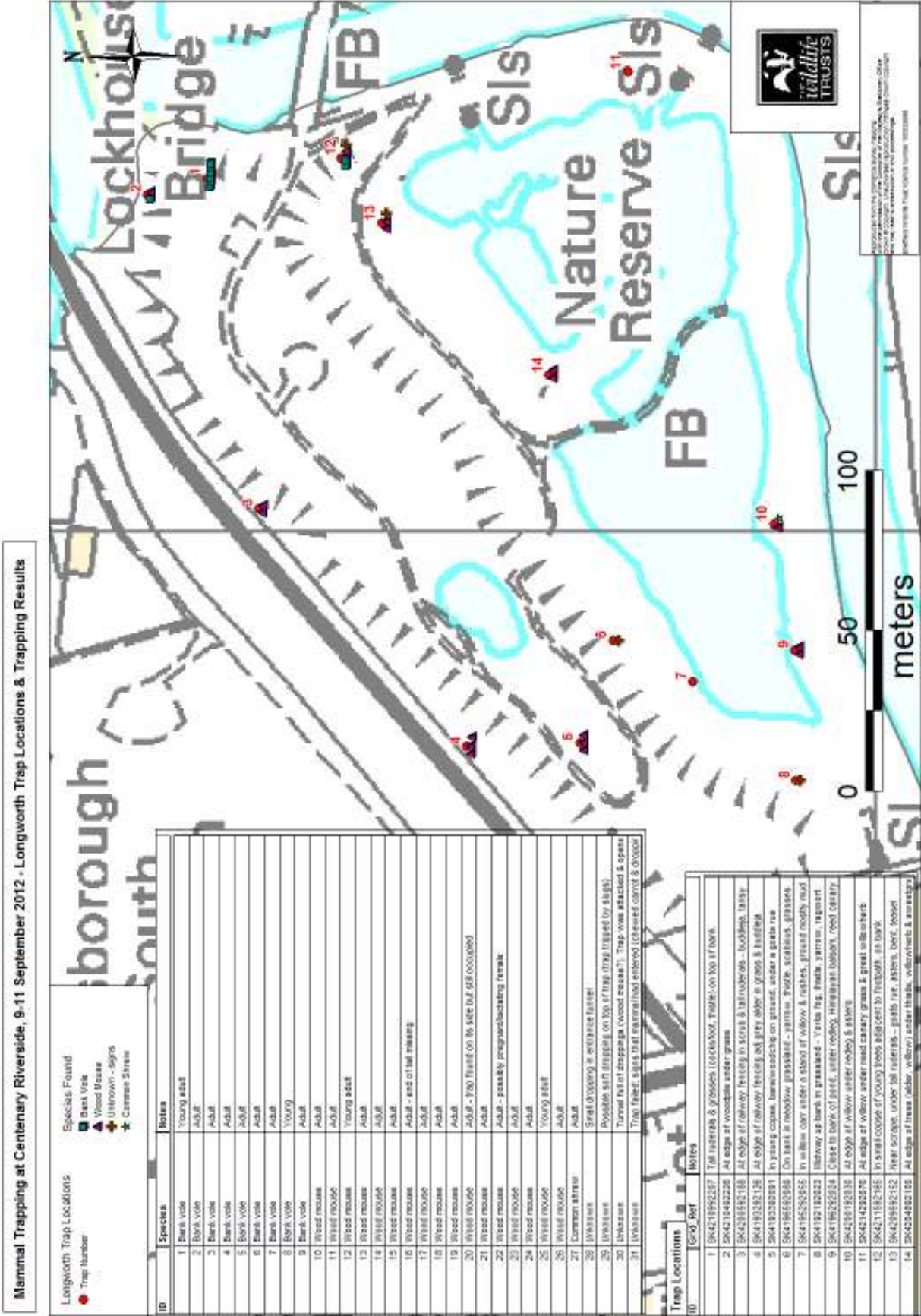




No photographs were taken of Trap 7 or Trap 14. All habitat photos by Martin Todd.



3 Trap Locations & Results



4 RESULTS

4.1 Field survey

		Date:	08/09/2012	09/09/2012	09/09/2012	10/09/2012	10/09/2012	10/09/2012	11/09/2012
		Weather:	Hot & dry	Cool & dry	Warm & dry	Cool & dry	Warm & dry	Warm & dry	Rained overnight, light rain showers
Trap #	Location								
1	Top of bank in tall ruderals & grasses (cocksfoot, creeping thistle)		X	Bank vole - young adult	Bank vole - adult. Trap was emptied then rechecked at end of visit, a second Bank vole - adult was present.	Bank vole - adult	Bank vole - adult	Bank vole - adult	Bank vole - young
2	Edge of woodpile in grasses & tall ruderals (cocksfoot, false oat grass, nettle)		X	X	X	Wood mouse - adult	X	Bank vole - adult	Bank vole - adult
3	Edge of railway line in scrub & tall ruderals (buddleja, hawthorn, broom, tansy)		X	X	X	Wood mouse - adult	X	Wood mouse - adult (trap found on its side)	Wood mouse - adult
4	Edge of railway line in scrub & tall ruderals (grey alder, buddleja, grasses)		X	Wood mouse - adult	X	Wood mouse - adult	X	Wood mouse - adult	Wood mouse - adult
5	Among recently planted trees on top of bank (goats rue)		X	Wood mouse - young adult	X	Wood mouse - adult - end of tail missing	X	Wood mouse - adult, possibly pregnant/lactating female	Wood mouse - adult
6	On meadow grassland bank (yarrow, thistle, various grasses, scabious)		X	X - droppings in tunnel	X	X	X	Trap removed for cutting	Trap removed for cutting
7	In willow carr at water margins (rushes)		X	X	X	X	X	X	X

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8	On meadow grassland bank (Yorkshire fog, creeping thistle, yarrow, ragwort, St John's wort, scabious)	X	X - tripped by slugs. Possible dropping on top of trap.	X	X	Trap removed for cutting	
9	Under tall ruderals at water margins (redleg, Himalayan balsam, reed canary grass, nettle)	X	Wood mouse - young adult	X	X	Wood mouse - adult	
10	At edge of willow at water margins (redleg, aster)	X	Common shrew - adult	X	Wood mouse - adult	X - tripped by slugs	
11	At edge of willow at water margins (reed canary grass, great willowherb)	X	X	X - tripped by slugs.	X	X - tripped by slugs	
12	Among recently planted trees on top of bank	X	X	Bank vole - adult.	X - mammal had visited (carrot & apple chewed) but door failed - trap replaced	Bank vole - adult	Wood mouse - adult
13	Near scrape, under tall ruderals (goats rue, asters, teasel, bent)	X	X - tunnel full of droppings (wood mouse?) Trap had been turned upside down and opened, probably by an animal (fox? Mink?)	X	Wood mouse - adult	X	Wood mouse - young adult
14	At edge of willow at water margins (alder, willow, creeping thistle, willowherb, sweet grass)	X	X	X - trap failed; badly set.	Wood mouse - adult	X	Wood mouse - adult

On removal, the traps were double-checked to ensure that they were still in working order, which they were. The only other creatures caught in the traps were slugs and spiders.

Following are photographs of the captured species.



Bank vole (photo Julie Riley)



Common shrew (photo Julie Riley)



Wood mouse (photo Julie Riley)



Slugs! (photo Julie Riley)

5 DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussion of results

This survey had a very successful capture rate, with a total of 17 wood mice, nine bank voles and one common shrew being caught in the traps, a total of 27 specimens. Other traps had signs of visitation or in several cases were tripped by very large slugs.

To enable comparison with future surveys, or surveys at other sites, the capture rate can be expressed as **Captures per 100 Trap Rounds**. (This is often known as Trap Nights but as we kept the traps open continuously and checked morning and night, I have used rounds rather than nights.)

This is calculated as follows:

X traps were set for Y rounds - 14 traps were set for 6 rounds (with 4 rounds removed when 2 traps were removed on Mon am) = **80 trap rounds**.

Correcting for sprung traps and captures which means 'available' trap rounds were lost – $0.5(\text{captures} + \text{sprung, empty traps}) - 0.5(27 + 7) = 17$. So 80 minus 17 = **63 corrected trap rounds (CTN)** – using Beauvais & Buskirk's 1999 formula.

Index of abundance = $\frac{\text{Captures} \times 100}{\text{CTN}}$

CTN

i.e. $2700/63 = 42.8$ **captures per 100 trap rounds**.

5.1.1 Bank Vole

The bank vole is a very common small mammal across much of mainland Britain. It supplies a large part of the diet of tawny owls and animals such as weasels and stoats, so although its population is high (estimated at 25/ha in spring according to the Mammal Society website), it is important to consider its conservation to maintain abundance.

Bank voles typically live in mature deciduous woodland, particularly where thick field and shrub layers exist, but are also found in young deciduous woodland and hedgerows or areas with dense ground cover, particularly brambles. They need a good supply of water which they typically get from their food (berries, seeds and plant leaves).

At Centenary Riverside, bank vole captures were restricted to traps 1, 2 and 12 along the northeastern edge of the site. All these traps were sited on fairly rubbly bank edges among tall ruderals and grasses including creeping thistle (*Cirsium arvense*), cocksfoot (*Dactylis glomerata*), false oat grass (*Arrhenatherum elatius*), nettle (*Urtica dioica*) and other plants, near patches of bramble, buddleja and close to the river and the railway.

5.1.2 Wood Mouse

The wood mouse is found throughout the British Isles and is our most common and widespread wild rodent. It lives mainly in woodland and fields but can be found in a variety of habitats including scrub, gardens and allotments. They are predated on by tawny owls (and presumably other birds of prey such as kestrels), foxes and weasels. They also form part of the diet of mink, and a mink is known to be present on site – possibly the cause of the ‘attack’ on Trap 13 on the morning of the 9th September.

Conservation measures are not considered necessary due to the abundance of this species. They have a very catholic diet, eating seeds, green plants, fruits, buds, caterpillars, worms and centipedes, blackberries and fungi.

At Centenary Riverside, wood mice were the most common captured animal, and were also the most likely source of droppings/other signs found in traps that were visited but not triggered. They were more commonly found along the top of the long bank down towards the railway line (traps 4 and 5 recording the highest number of visits, towards the western end of the site). However there were specimens trapped across the majority of the site; the only traps with no captures were the two along the meadow bank (traps 6 and 8), and the two traps set within willow carr near the water’s edge (traps 7 and 11). Trap 1 was continuously occupied by bank voles but wood mice were found in adjacent traps so it is likely they are in this area too.

5.1.3 Common Shrew

The common shrew is found throughout Great Britain (except Ireland) and is one of our most common mammals. It is found abundantly where low vegetation occurs, particularly in rough grass, hedgerows, scrub, deciduous woodland. The common shrew is very territorial. They are predated by owls, weasels, stoats and foxes.

They are carnivorous and insectivorous, eating slugs, insects, spiders, worms and small mice, and need to eat every 2-3 hours, as they need to consume 200%-300% of their bodyweight each day to survive. Conservation measures are not considered necessary due to their abundance.

At Centenary Riverside, one common shrew was captured in Trap 10, in the area between the river and the ponds with a good cover of low vegetation (mostly redleg and asters in this location). Shrews are not known to be particularly trap-shy so this may indicate a low population density on site.

5.1.4 Location of catches

Traps were distributed fairly evenly across the site (apart from the Eastern end of the meadow bank, as previously discussed) and attempted to sample all habitats present. Most of the traps had some success; the only areas where there were no signs of mammals at all were traps 7 and 11. Both of these traps were adjacent to the pond area; trap 7 was placed on silt/mud under willow with no covering vegetation, and trap 11 was placed within reed canary grass adjacent to willow. Both areas had a low abundance of food

sources such as seedheads and this is the most likely reason why small mammals did not visit.

Traps 6 and 8 were placed on the wildflower bank, neither trap captured any animals, but both traps showed signs i.e. droppings on the top of the trap or in the tunnel on one occasion. The reserve manager expressed surprise that no mammals were trapped on this bank, however the strimming of the bank may have scared away mammals from their usual routes, and also the traps were frequently tripped by very large slugs, thus making them unavailable to catch mammals.

5.2 Conclusions and recommendations

The high capture rate of 42.8 per 100 trap rounds was encouraging and show that the habitat is suitable for small mammals, particularly wood mice which were abundant on site.

Bank voles were restricted to the northeastern area of the site and were closely associated with the tall ruderal/rank grassland communities on the rubbly bank down to the river and railway. This habitat needs to be maintained in order to provide the conditions that so obviously suit the bank vole, consideration could be given to recreating similar habitat on other areas of the site if their range was to be extended.

Wood mice were widespread across the whole site, with the most populated area seeming to be towards the western end, nearer to the railway lines. There was a surprising lack of captures along the central meadow bank, however the strimming that was taking place just before the survey started may have disturbed mammals along this bank and displaced them elsewhere.

Common shrews were not very common on the site; this may be due to the type of habitat available, or they may not be locally common.

The length of the survey was adequate to get a good sampling rate and any future surveys should be done over multiple nights/mornings. There did not appear to be any requirement to lock the Longworth traps open for a night to allow mammals to become familiar with them. It would be interesting to conduct a survey in the spring, to see whether there is a marked difference in mammal numbers when compared to late autumn.

As small mammals are often popular with the public, a future small mammal survey could provide an opportunity to get local volunteers involved as part of community engagement work. Having a larger pool of local volunteers might also mean a survey could take place over a longer time period as there would be more resource available to check and reset traps.