

Bourn Brook Water Vole and Invasive Plants Survey

Spring 2019

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THE COUNTRYSIDE
RESTORATION TRUST



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Introduction

The “Bourn Free” project has run since 2011, led by the Wildlife Trust and the Countryside Restoration Trust, in partnership with the Environment Agency. We work with local landowners and local volunteers. This survey was supported by the Cambridge Water PEBBLE Fund and by Anglian Water via the Water for Wildlife programme.

Why the Bourn Brook?

The brook was known to have a remnant water vole population in 2011, at a time when water voles seemed to be disappearing from much of the catchment. It also has been less modified than many other watercourses, retaining natural features such as meanders, riffles and pools. Species such as kingfisher and barn owl were also known to be present, as were a number of invasive plant species. There is local interest in the brook, not least because it is highly responsive to rainfall and is known to flood some of the villages it flows through.

What is the survey for?

This survey recorded signs of water vole, otter, Himalayan balsam and giant hogweed, repeating similar surveys from 2011, 2014 and 2017. The aim is to look for changes since the start of the project.

- **Giant hogweed:** this plant is harmful to health and was known to be present on the brook. We treat it twice a year with help from the Environment Agency.
- **Himalayan balsam:** this plant can crowd out native species and leave banks devoid of vegetation in winter when it dies back and vulnerable to erosion. We control it with volunteer work parties.
- **Water vole:** in 2011 the brook supported a population of American mink, which can cause the local extinction of water vole populations. Since autumn 2010, mink have been controlled on the brook, with control later expanding to the wider catchment.
- **Otter:** regularly uses the brook, leaving obvious signs which were easy to record as part of the survey.

Method

The watercourse was surveyed where possible by wading along the river bed. In areas where the water was too deep to wade, the bank was walked and the channel inspected with the aid of binoculars. Where vegetation prevented access to the water, checks were made approximately every 20m.

Sightings of water vole, latrines, droppings and feeding signs were used to confirm water vole presence. Signs such as holes in the bank and runs in vegetation were considered inconclusive on their own. The location and type of field sign found was recorded using a GPS unit. The GPS was also used to record the location of giant hogweed plants and patches of Himalayan balsam.

Signs of otter and mink were also looked for and their presence recorded.

Giant Hogweed Results

Giant hogweed was recorded in 2002. Unfortunately, it was not dealt with effectively at the time, and by 2011 the 5 records (8 plants) had become 91 records. At this point treatment began, with the Environment Agency treating plants in May and September each year (weather permitting). We also removed flower heads in late summer from any plants that were missed, to prevent them from setting seed.

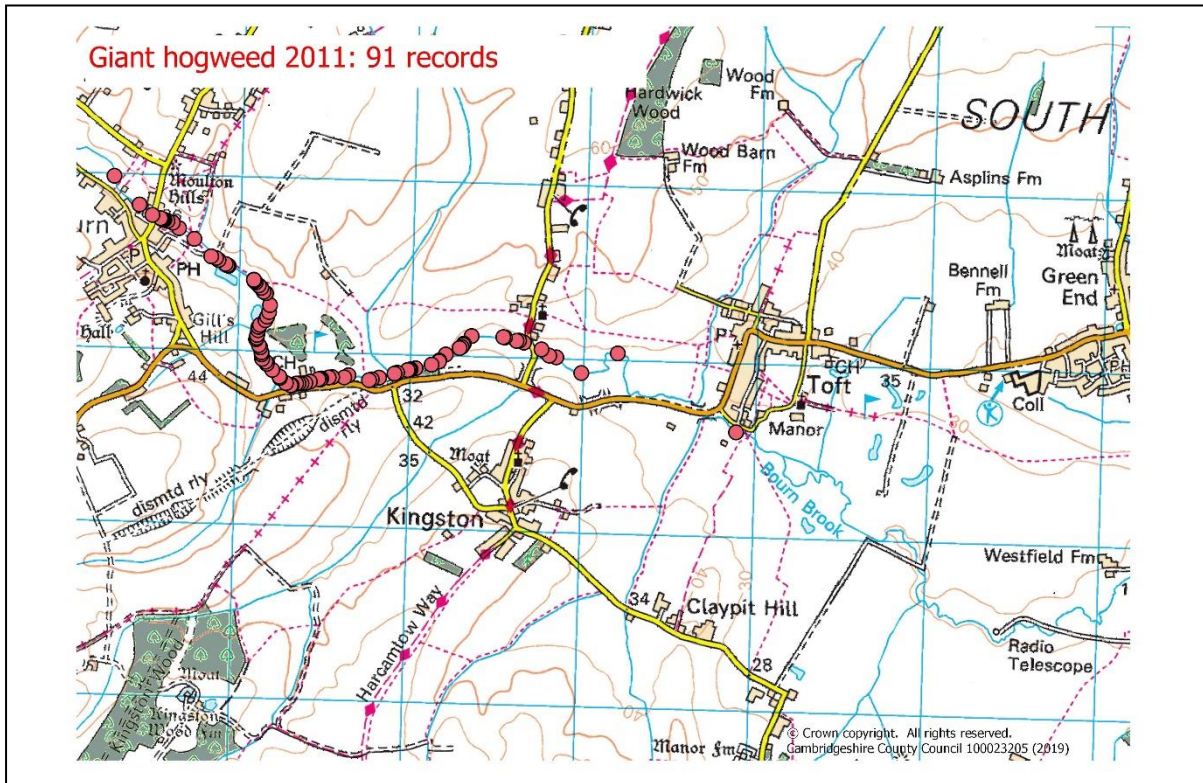
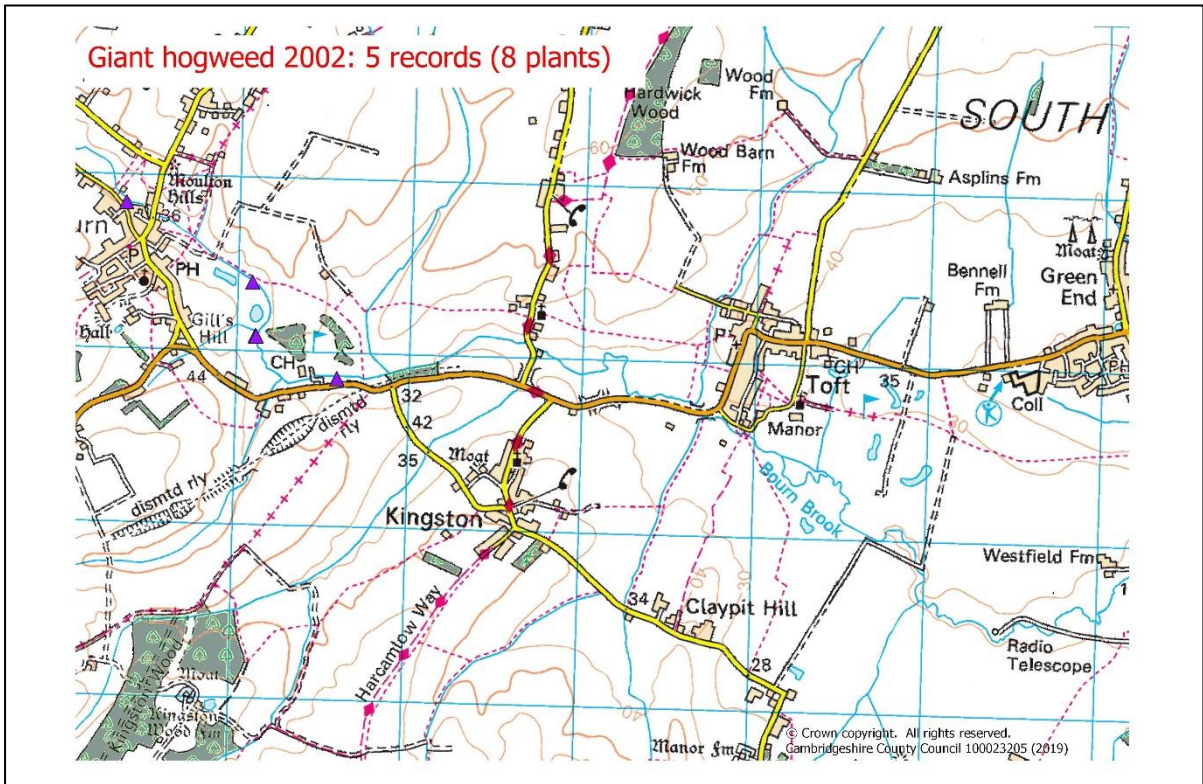


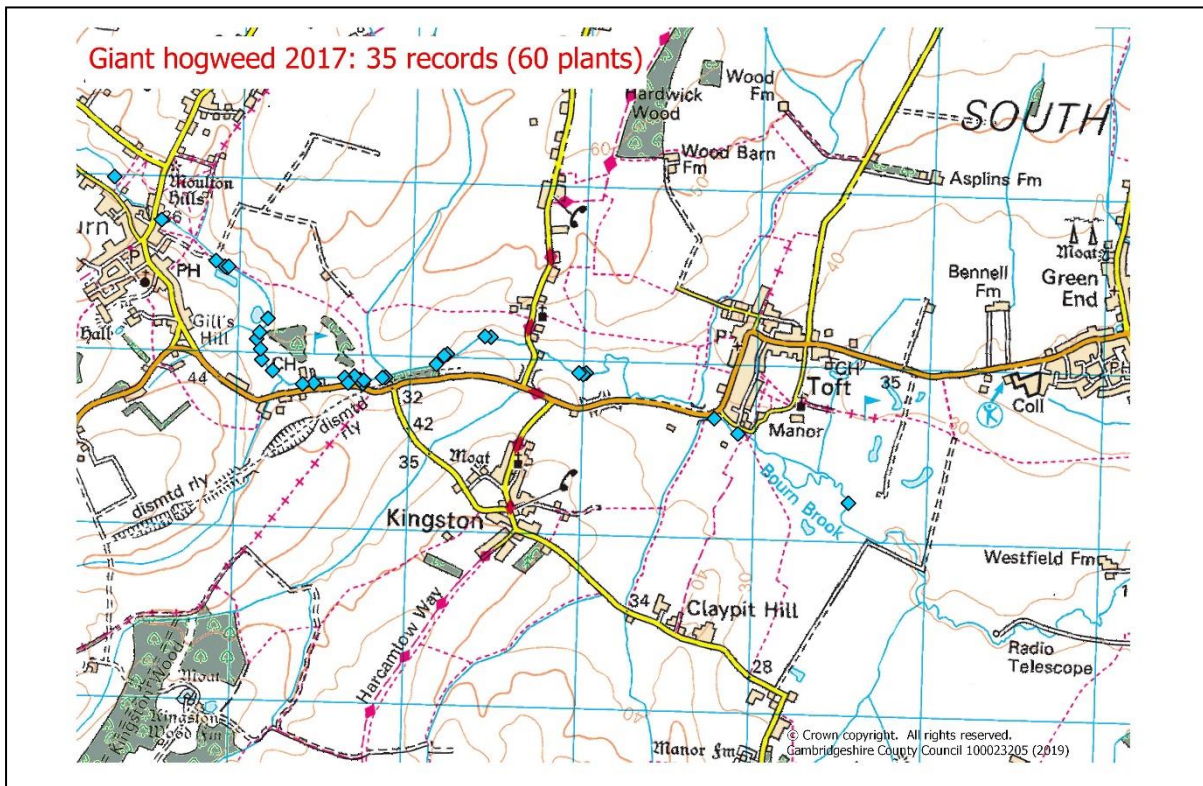
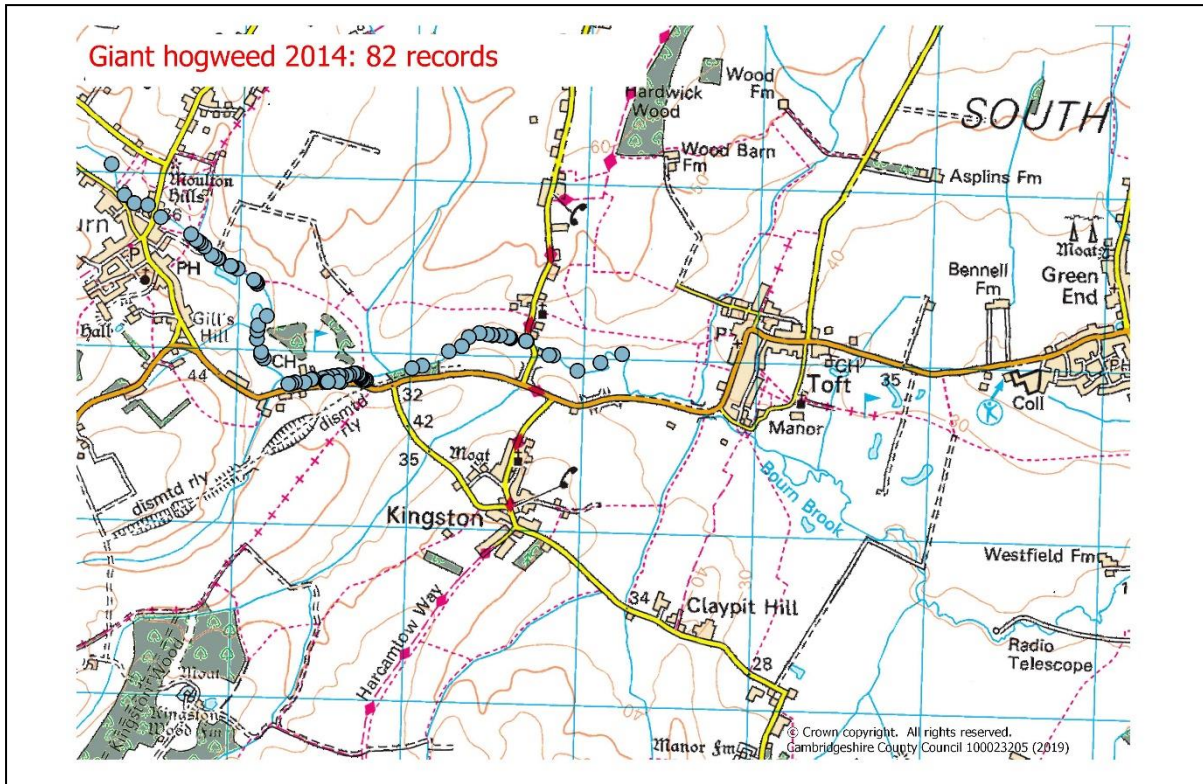
Giant hogweed
flowering on the
Bourn Brook,
2015

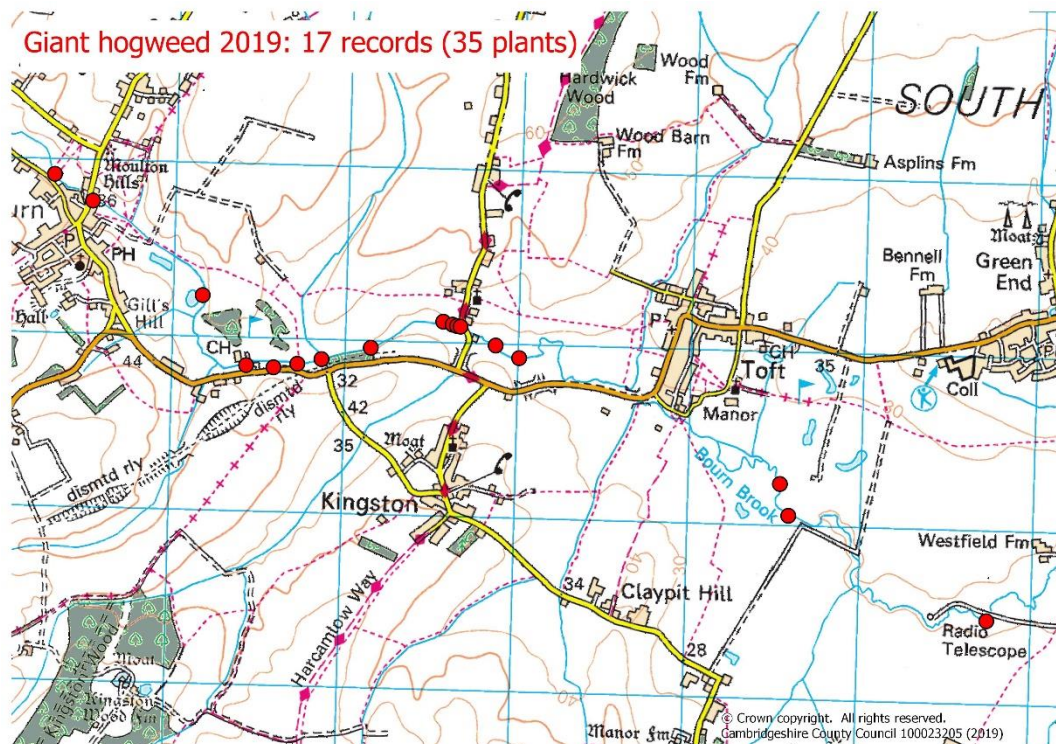
As the series of maps below shows, it took a number of years before there was a clear effect, but the number of plants is now decreasing. Over the years, occasional plants appeared downstream of the main treatment stretch (Bourn to Toft Bridge). These plants were treated, with the aim of ensuring no new patches establish. Balsam work parties record any plants that may have been missed. The 2019 survey found 17 records (35 plants, 15 of which were in a single patch), a significant reduction from the 91 records in 2011.

Future plans:

We will continue to treat the giant hogweed and to monitor it, with the aim of eradicating this plant from the brook.







Himalayan Balsam Results

The 2011 survey found Himalayan balsam present on the whole brook downstream of Bourn Ford, with the 2014 survey not showing any significant decrease despite 3 years of work pulling balsam. Two issues were identified: firstly that it would be more useful to concentrate effort on the upper end of the brook, so that control work was more likely to be successful. Secondly, although no change was apparent in the balsam maps, volunteers were convinced that the number of plants had reduced. The 2017 and 2019 surveys therefore attempted to quantify the number of plants present as well as the geographical spread.

Each record of Himalayan balsam was given a size:

Small:	1-6 plants
Medium:	up to 1m ²
Large:	1m ² to 5m ²
Huge:	bigger than 5m ²

These were then used to make a map indicating size of patch. Future surveys will use this same method, so that results are comparable.

Young Himalayan balsam growing in a “huge” patch. Bourn Brook 2017.



The maps below (from 2011, 2014, 2017 and 2019) are not directly comparable because patch size was only recorded in 2017 and 2019. Also, the downstream extent of surveys varied with the 2019 survey only extending to the A603. Downstream sections with no balsam records are unlikely to have been surveyed in that year.

However, the maps do show a significant reduction in the amount of Himalayan balsam on the brook, particularly at the upstream end (comparing maps from 2017 and 2019).

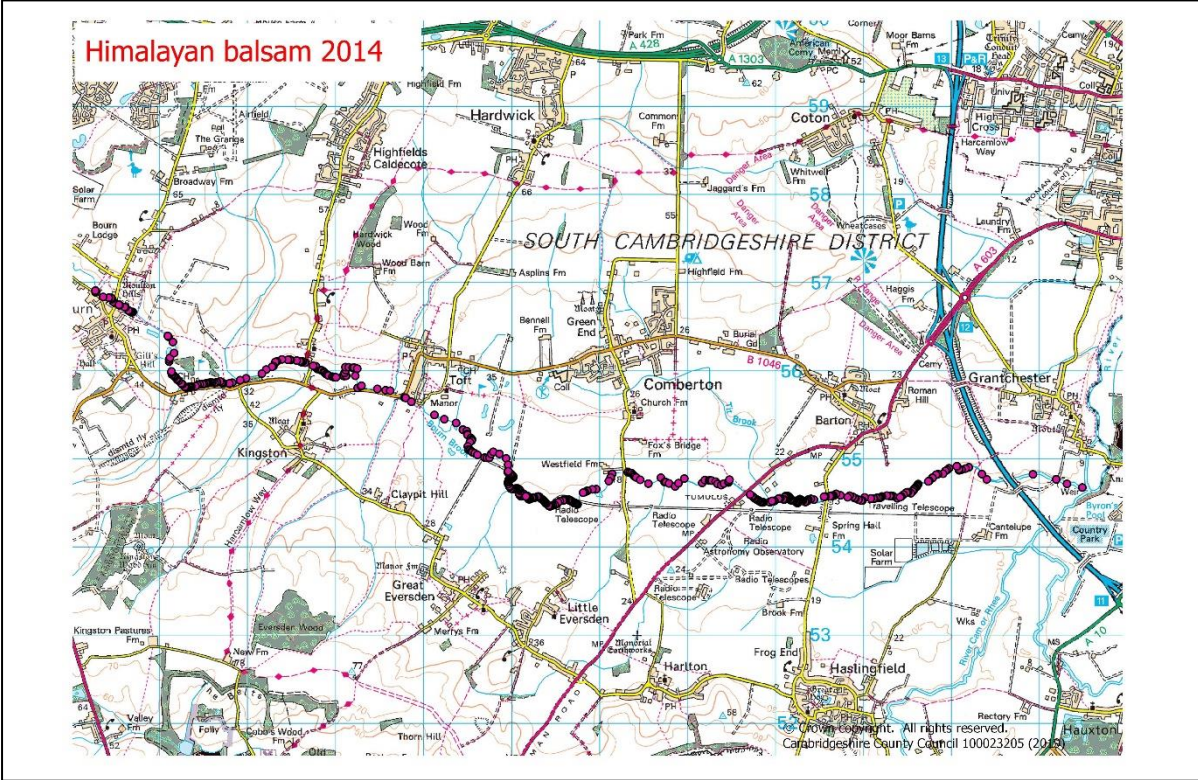
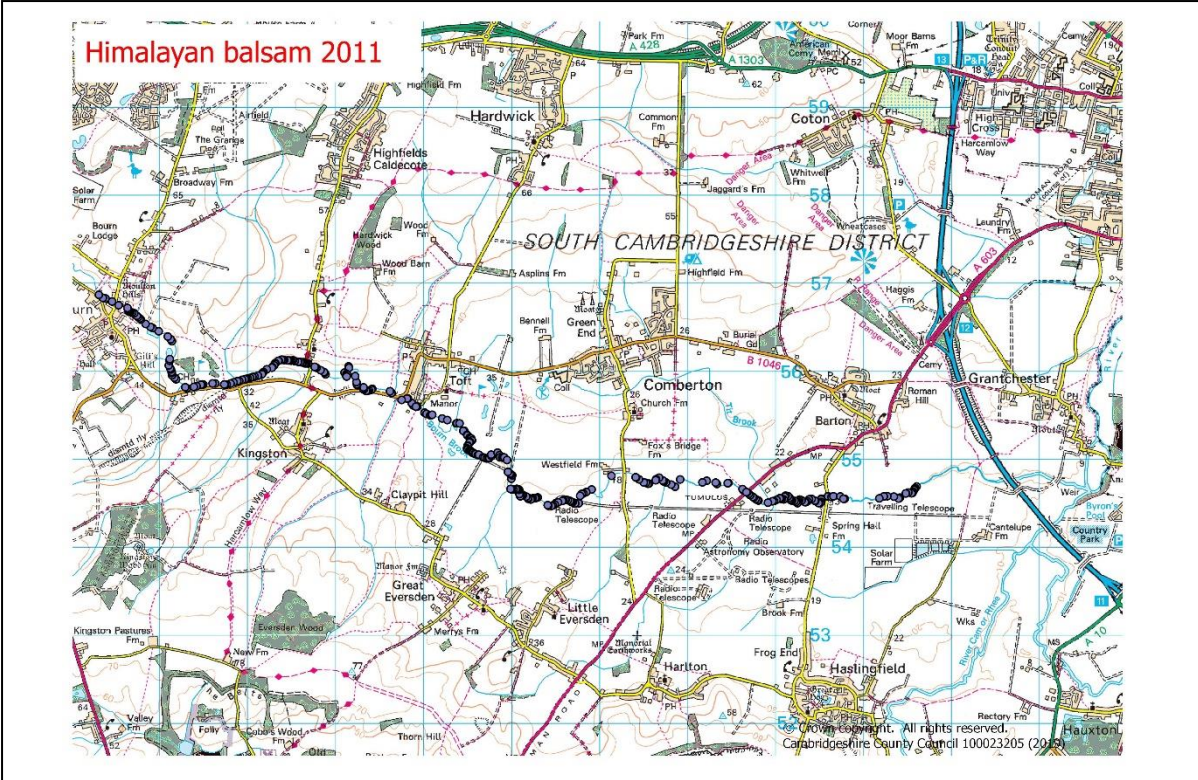
The greater reduction in balsam at the upstream end of the brook compared to the downstream end correlates to control effort, suggesting that reductions are a direct result of control rather than related to environmental conditions. Those areas with the most volunteer hours have shown the greatest improvements. The section with at least 2 visits per year had at most “medium” sized patches of balsam.

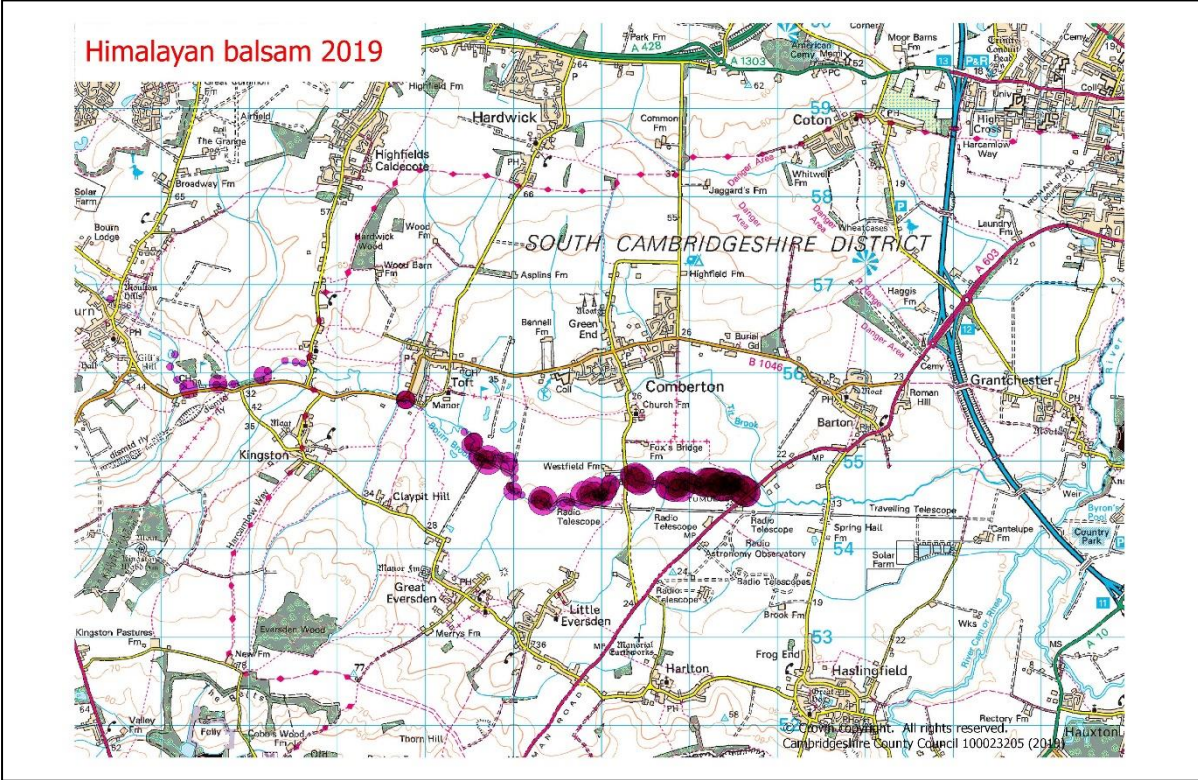
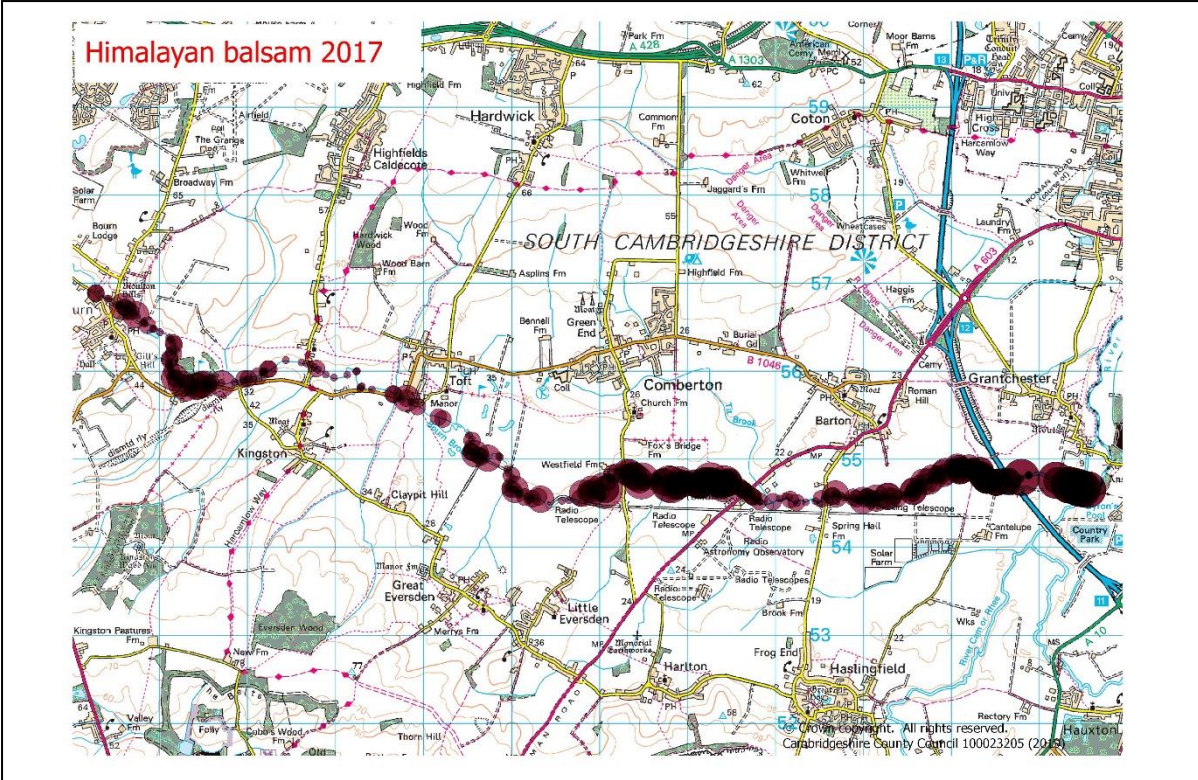
The amount of balsam on sections where there has been little or no control suggests that, had no control occurred, the brook would now have considerably more balsam, and probably more than in 2011.

Himalayan balsam germinates and flowers throughout the summer. Work appears to be selecting for later-germinating plants, so getting a section balsam-free requires multiple visits over the season. The efforts of local people pulling and reporting plants out of reach at the top end of the brook have been essential in finding the last remaining plants.

Future plans:

Continue to control balsam, with at least 2 visits per year on the upper section of the brook (more at the very top end), and start to expand more intensive control downstream. Re-survey in 3 years' time to see whether there has been a measureable change. Continue to focus on the upstream section and encourage local people to continue to report any plants that were missed.





Water Vole Results

Water voles are rarely seen so surveys record signs of their presence. While this does not give a number of animals, changes in the location and number of signs indicate changes in geographical spread and abundance. Water vole presence was recorded when the following signs were found:



Latrines: areas where water voles mark their territory. Older droppings are stamped down and marked with scent before new droppings are left on top.

Droppings: are recorded if there is no sign of territory marking.



Feeding stations: areas where water voles drop chewed vegetation. This is often bitten off at a 45° angle and neatly stacked.

The maps below show the results of the four surveys. Note that in 2019 the section downstream of the A603 was not surveyed, and this had a large number of water vole signs in 2017.

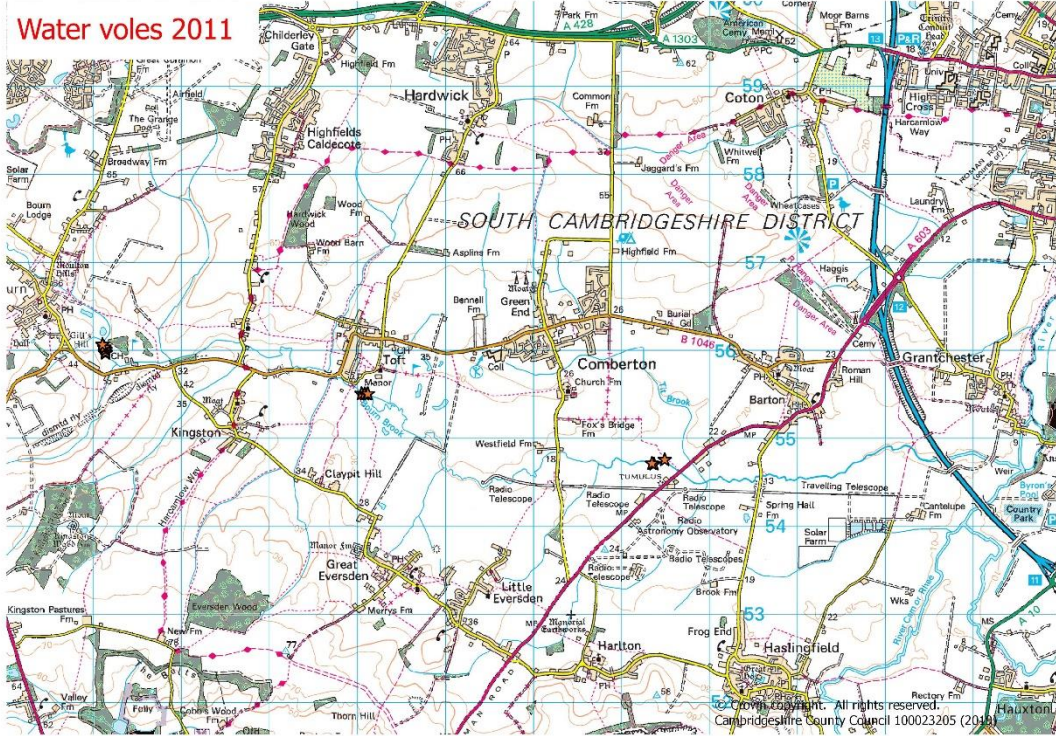
In 2011, water vole signs were recorded in 4 widely separated areas of the brook. The concern was that these were too far apart for voles to move easily between populations. In 2014 the number of signs had increased and expanded.

By 2017, water vole signs were present on most of the brook, now looking like a single population.

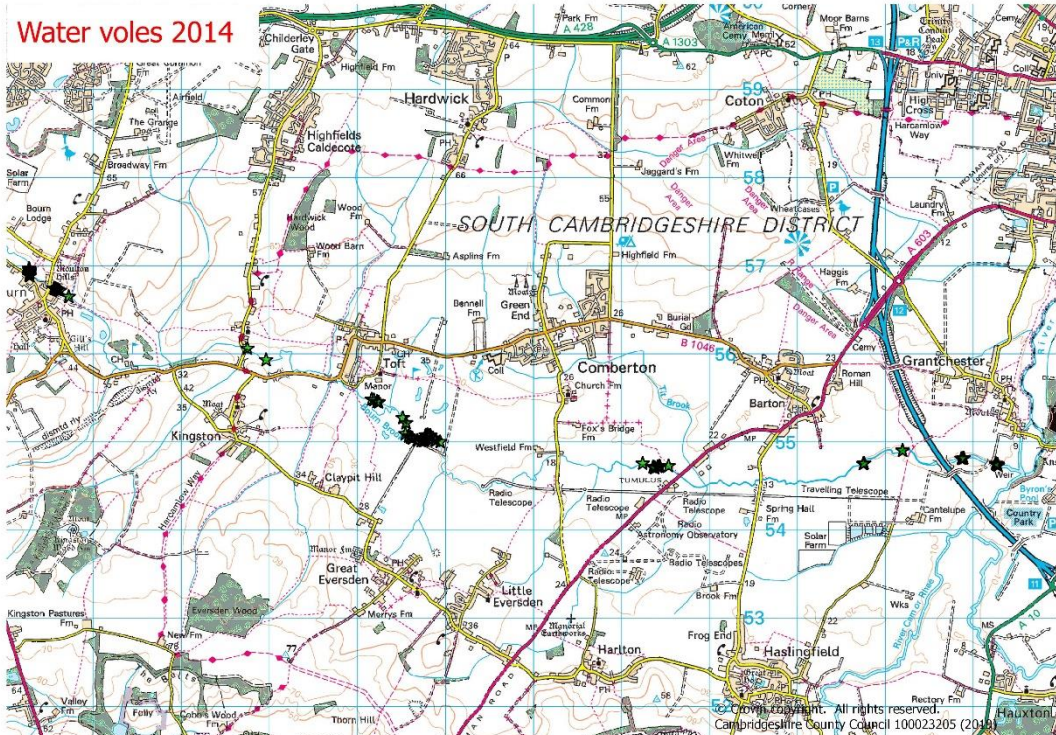
In 2019, water vole signs were closer together with a less continuous distribution. Overall, the number of signs found on the surveyed section was slightly more than in previous years (see tables following the maps). This suggests that the extremely dry weather, which led to many very shallow sections of brook, limited the available good habitat.

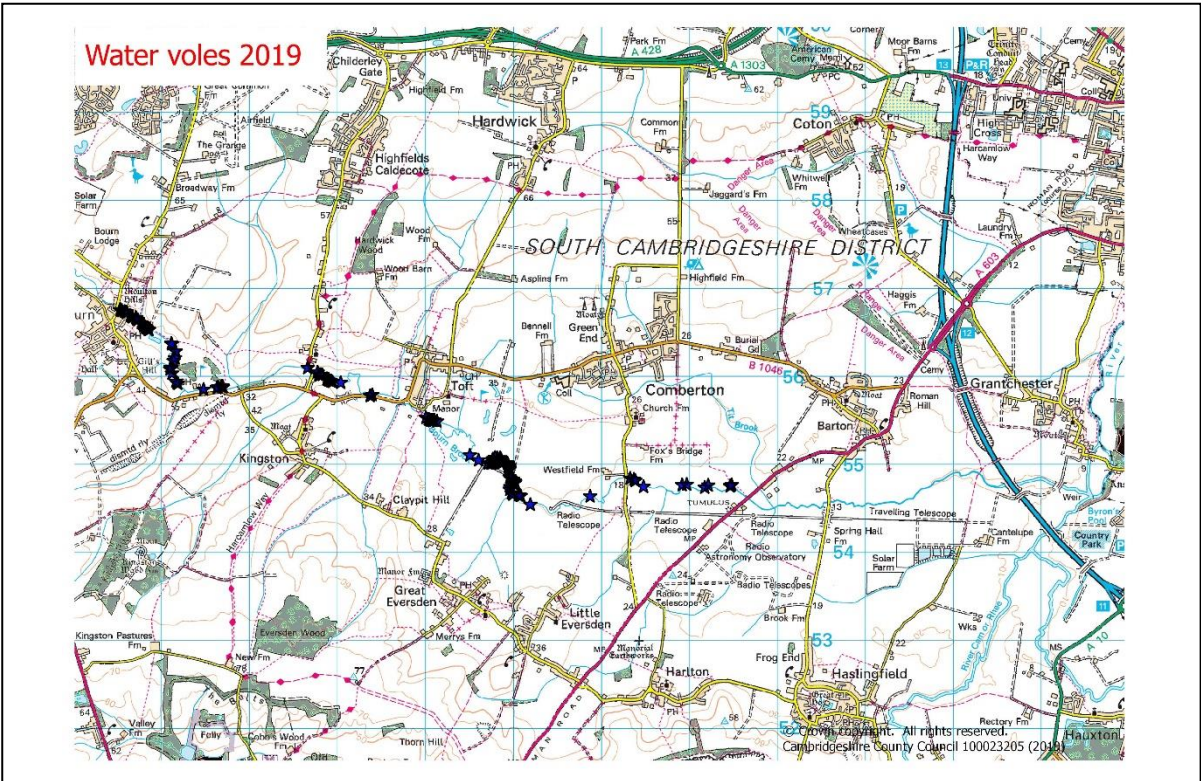
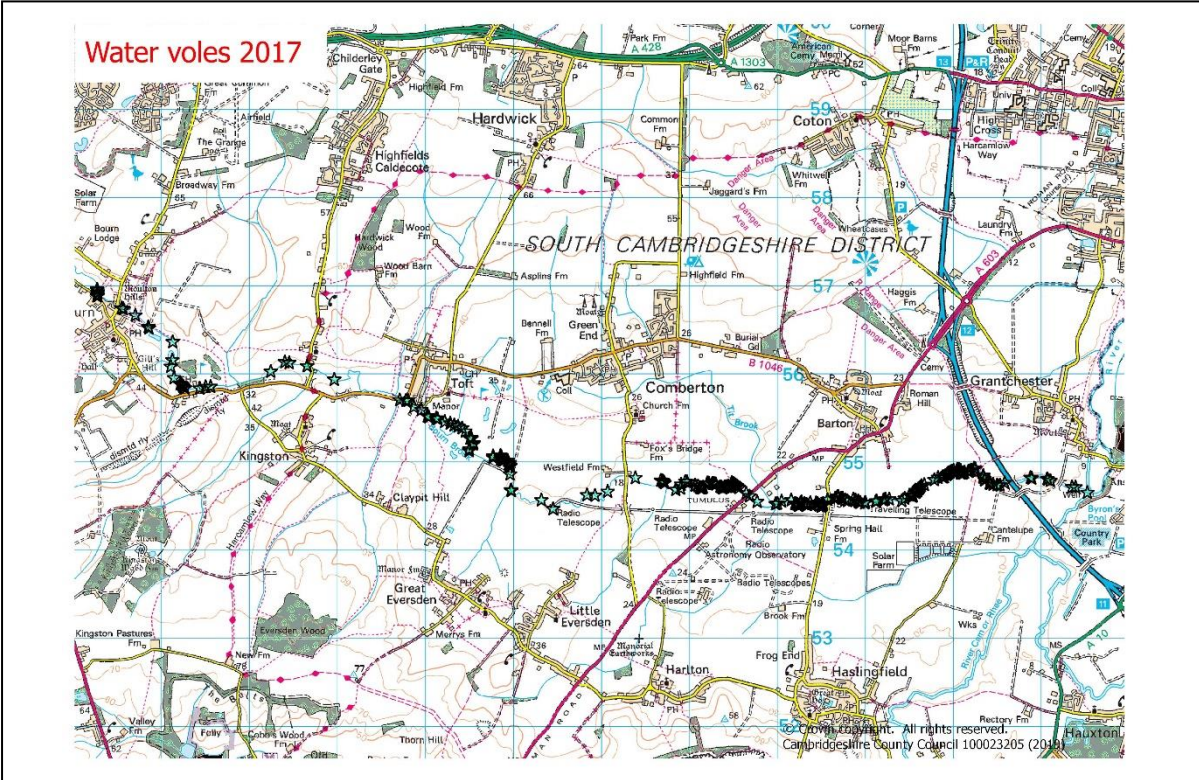
Future surveys will show whether this effect is temporary, and if so this will increase the likelihood of it being weather related.

Water voles 2011



Water voles 2014





Summary of water vole sign records:

	2011	2014	2017	2019
Latrines	2	38	157	125
Droppings	1	33	190	119
Feeding piles	29	100	261	284

Records upstream of the A603 only (section surveyed every time):

	2011	2014	2017	2019
Latrines	2	37	96	125
Droppings	1	32	99	119
Feeding piles	29	91	164	284

No signs of mink were recorded during the survey. This does not mean the brook is completely mink free, but the absence of signs, plus the increase in numbers of moorhen and water vole imply they are scarce in the catchment.

Mink were almost certainly having an impact on water vole numbers in 2011, with 41 caught in the winter of 2010-11 and 44 in the following year. Now that mink control is present on the wider catchment, very few mink are found in the area. This correlates with the increase in water vole throughout the catchment over this time. In addition, more successful nests of birds such as moorhen and kingfisher were noted, which also points to a reduction in the number of mink.

Other predators such as otter and polecat are now also present and may be increasing pressure on any mink that manage to get as far as the brook.

Future plans:

Continue to monitor water vole every 3 years. Look for opportunities to create or improve suitable habitat. Continue to monitor for mink and remove any that are found.

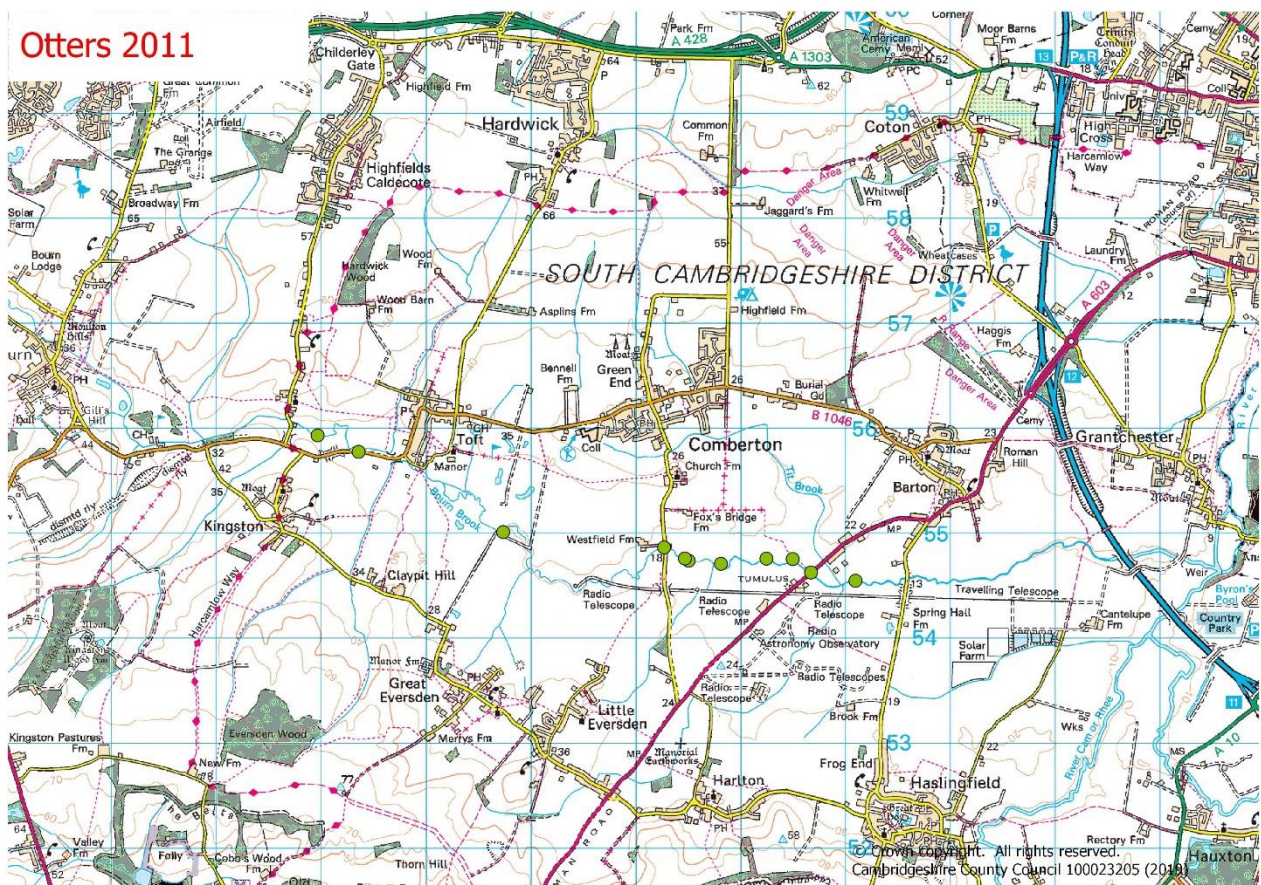
Otter results

Otters are known to use the Bourn Brook as well as the rest of the upper Cam, and spraint and prints were recorded in passing for each survey. The number of otter signs increased each time until 2017, with 11 records in 2011, 35 records in 2014 and 90 records in 2017. In 2019 there were only 16 records. The reason for the decrease is not clear, although it is known that an otter successfully reared cubs in the upper reaches of the brook in 2015. Low water levels in the brook are the most likely explanation of the sudden drop in signs. Future surveys are needed to show whether this is the case, or whether there is a different threat to otters.

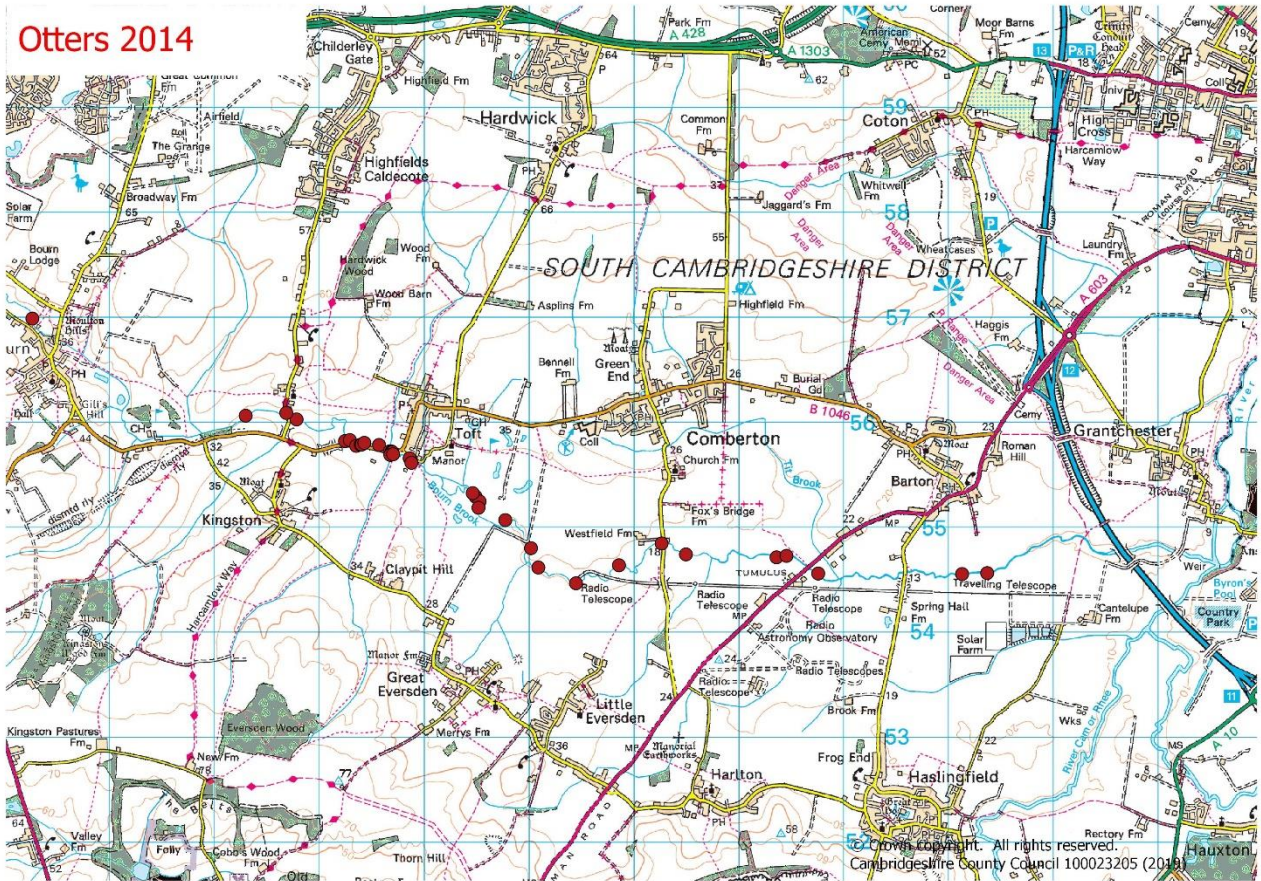


Otter photographed on the River Cam, not far from its junction with the Bourn Brook, 2017

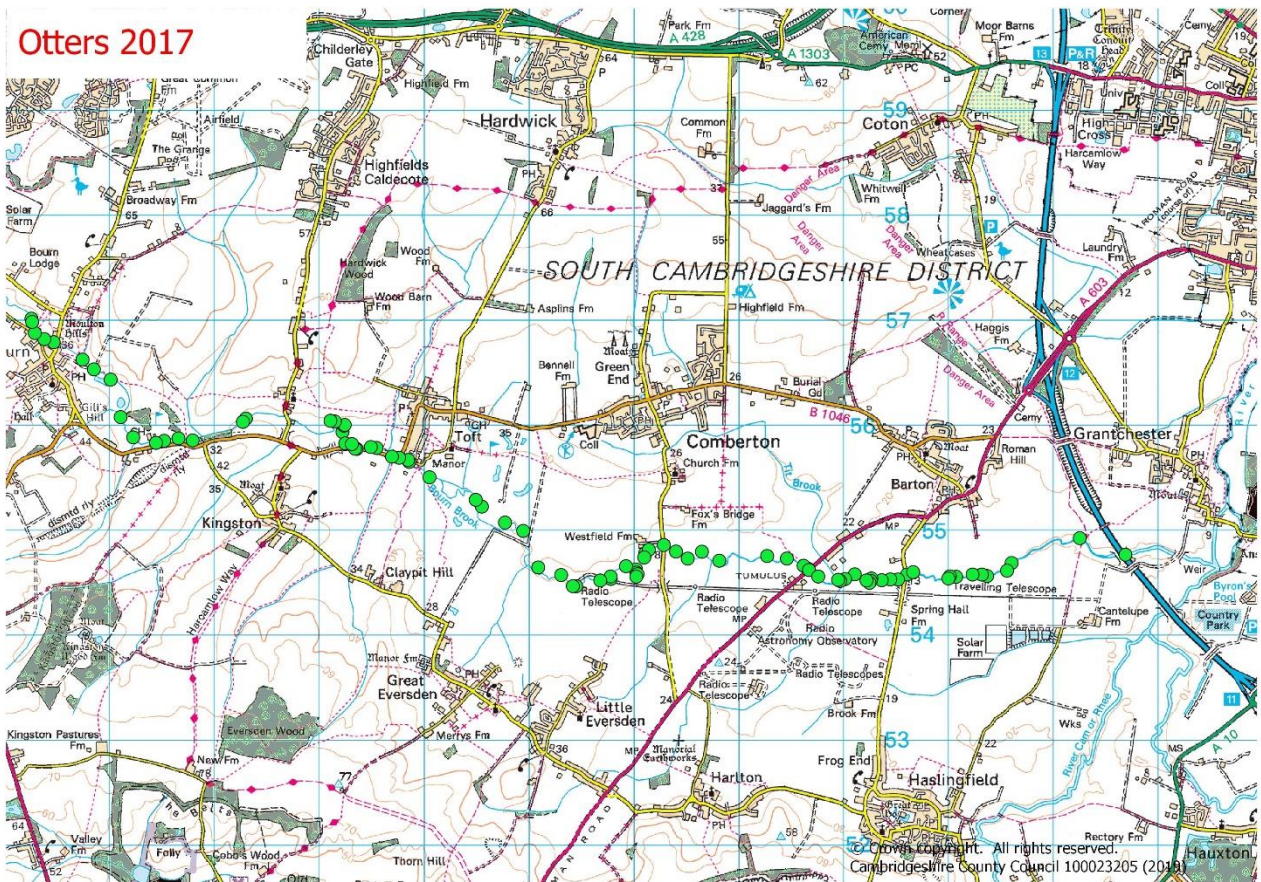
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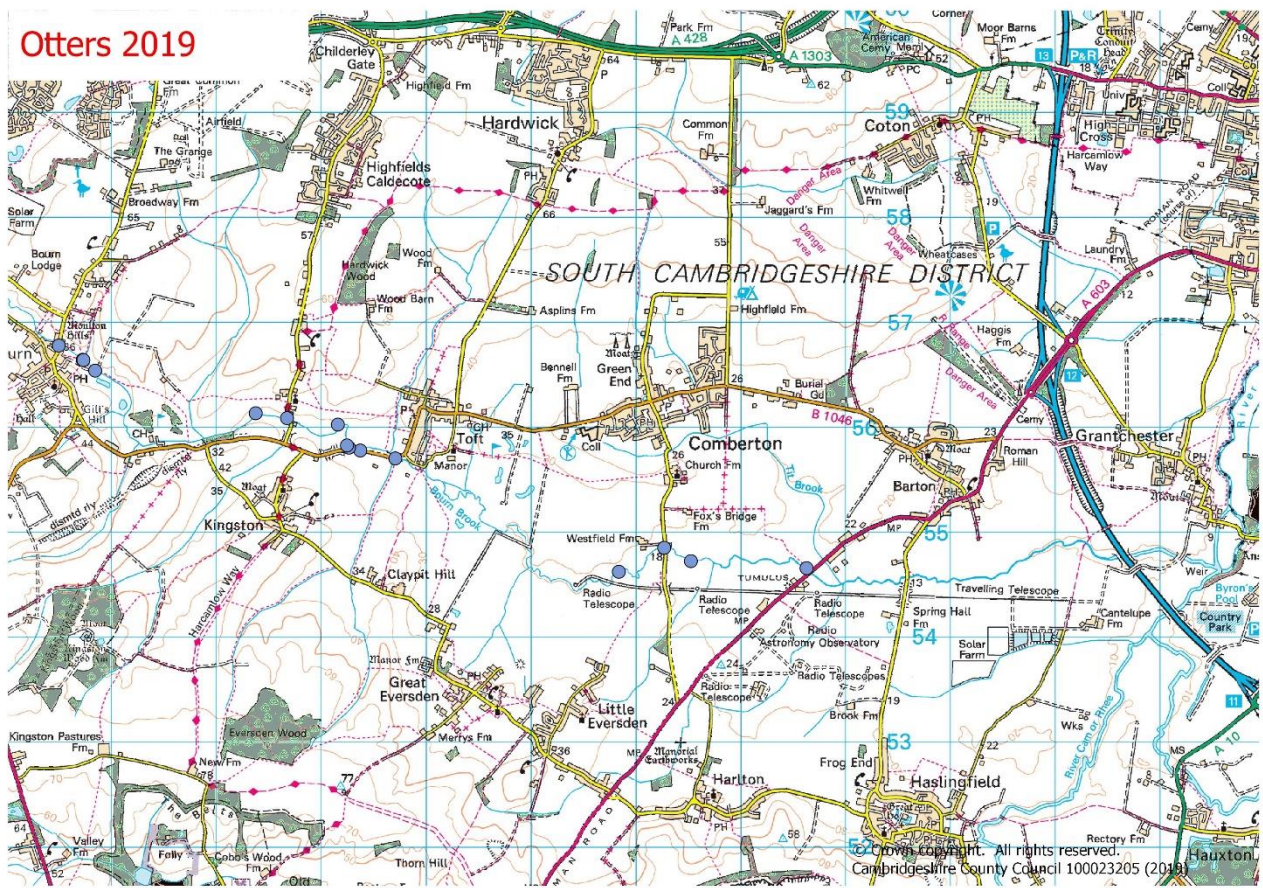
Otters 2014



Otters 2017



Otters 2019



Summary

The work of the Bourn Free Project on the Bourn Brook is starting to show positive changes. There has been a significant increase in the number of water voles, correlating with a decrease in mink, and also a significant decrease in Himalayan balsam and giant hogweed.

The project has had the added benefit of building links with landowner and local people, and getting more people interested in the brook.

Aims for future work

In addition to continuing with existing work, we have started looking at flood flows and water quality. The aim is to produce a map of potential projects to be discussed with landowners and to help find funding should landowners wish to proceed. Projects may reduce flood flows, improve water quality or create or improve habitat (or several of these at once). Funds from Cambridge Water's PEBBLE fund are supporting this opportunity mapping.

Appendix 1: The Bourn Free Project

The project began when the Countryside Restoration Trust (CRT), working with the Wildlife Trust, launched a campaign to restore native wildlife and habitats on the Bourn Brook. All landowners along the Brook are invited to join us as working together we can achieve much more.

CRT lead on the initial phase of the project, which is to control American mink. Mink were brought to Britain for fur-farms, but many escaped, and many more were deliberately released by protesters opposed to the fur trade. They found an abundance of prey unable to cope with a new predator – particularly our native water vole which has become the most rapidly declining mammal in Britain. Control has been successful in that over 80 mink have been removed from the brook and new animals arriving are detected and removed as soon as possible. Very few animals now arrive following the expansion of mink control to the wider catchment. This success is reflected in the recovery of water vole and moorhen on the brook and throughout the Cam catchment.

The second phase of the project was to tackle the invasive plants giant hogweed and Himalayan balsam. Our control measures are demonstrably reducing the prevalence of these plants.

Eventually we hope through this project to achieve much more along the brook, including improving water quality and improving habitat in and adjacent to the watercourse. The aim is to have a properly functioning wetland ecosystem, an abundance of wildlife and storage of floodwater on flood meadows rather than exporting it downstream to flood villages and properties. Being a 'wildlife corridor', work on the length of the brook will have a greater impact than the sum of each individual's actions.

Habitat work already completed includes coppicing near Caldecote to increase light to the water plus work over a number of years by the Countryside Restoration Trust on their own land:

- Putting in a riffle where a meander loop had previously been cut off. The meander has been retained and flows when in flood.
- Trees have been pollarded.
- A small log-jam dam was created about 20 years ago. Several others have formed of their own accord and are kept.
- Osier beds and meadows have been planted to protect the river banks and hold up flood water.
- Lots of crack / white willows were planted about 15 years ago, as isolated trees along open stretches of the brook (some now big enough to have already begun their pollard cycles). Also a few black poplars were planted in more recent years and are now getting established.
- A pond has been dug in one meander loop, which takes flood water when the brook bursts its banks. Another one is connected by a back-channel and takes water at lower river levels but is in need of de-silting.
- A further meander loop has been re-instated.

Monitoring and mapping of flows is also in its early stages, and we are currently visiting landowners and producing a map of potential projects.

Appendix 2: Invasive plants

Giant Hogweed

Giant hogweed is native to the Caucasus Mountains in Eurasia and was introduced as an ornamental plant in the nineteenth century. Over time garden escapees have gradually colonised new areas in the wild particularly in wasteland and riparian environments. Giant hogweed is a threat to human and animal health as well as having ecological consequences such as suppressing the growth of other plants, de-oxygenation of water and soil erosion.

Giant hogweed is a phototoxic plant whose sap can cause severe skin inflammation when exposed to sunlight or UV rays. For some victims, their reactions can recur for many years.

It is an extremely hardy plant that colonises areas quickly. With the benefit of thousands of seeds per plant; potentially viable seeds after fifteen years; growth patterns which lead to dense colonies and a fairly rapid reproductive rate, giant hogweed is a formidable problem for any land owner to tackle.

We work with the Environment Agency to control giant hogweed with herbicide, mapping any sightings to ensure no plants are missed.

Because control measures only affect growing plants, and the seed bank can last many years, control will be needed every year for a long time.

Himalayan Balsam

Himalayan balsam is native to the Western Himalayas and was introduced to this country in the nineteenth century. It became more widely distributed in the 1960s and is now widely established in other parts of the world. Over time, Himalayan balsam has gradually colonised new areas and like the giant hogweed can often be found in and around damp land and riparian environments.

It grows rapidly; hundreds of seeds per head that explode from the head up to a distance of around seven metres mean that it can spread easily; seeds remain viable for up to two years; it out-competes other vegetation and readily colonises new areas. Himalayan balsam is relatively shade tolerant and reputed to be one of the tallest annual plants to be found in the UK. It also suppresses the growth of grasses and native British plants leaving banks bare of vegetation during the autumn and winter making areas sensitive to erosion.

We control Himalayan balsam by pulling, with teams of volunteers, between late May and early September. Help with this task is always very welcome.

Control has been focussed on the upstream end of the brook, which now has a much-reduced population.