Bourn Brook Water Vole and Invasive Plants Survey

Spring 2017

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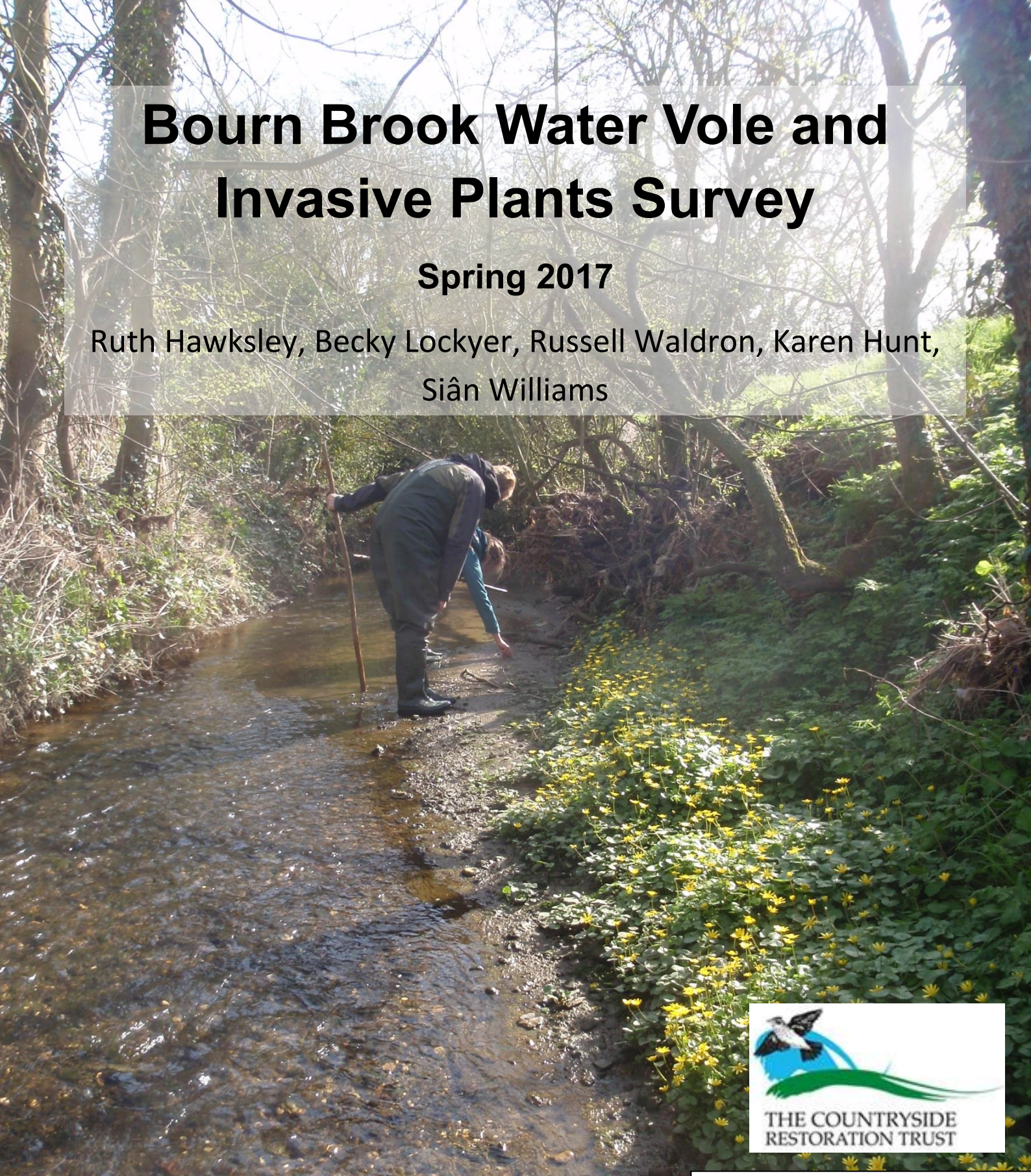


THE COUNTRYSIDE RESTORATION TRUST

THE wildlife TRUSTS

Bedfordshire
Cambridgeshire
Northamptonshire

Supported by:

Anglian Water

CAMBRIDGE WATER COMPANY

Report prepared by	Ruth Hawksley	7/06/2017
Report checked by	Martin Baker	19/6/2017

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 Cambridge Water.

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 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 and 2014. 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 vulnerable to erosion when it dies back in winter. 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 waded where possible. Where vegetation prevented access to the water, checks were made approximately every 20m. In areas where the water was too deep to wade, the bank was walked and the channel inspected with the aid of binoculars.

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. Where mink rafts were present and accessible, they were checked for scats, spraints and footprints.

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.

Giant Hogweed Results

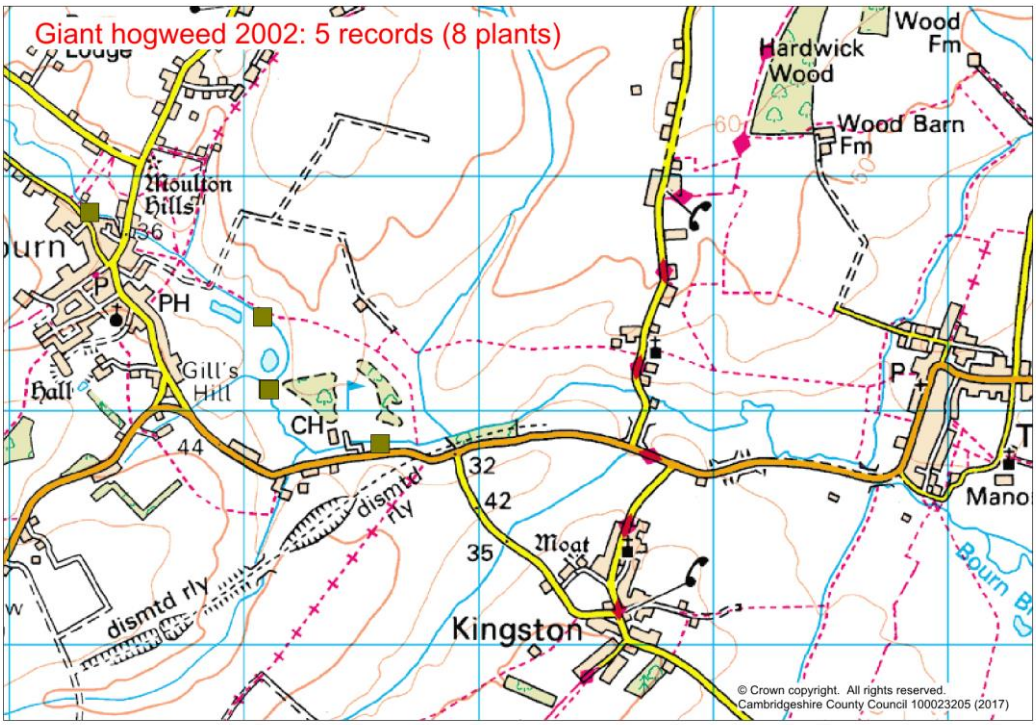
Giant hogweed was recorded in 2002. Unfortunately it was not dealt with effectively at the time, and by 2011 the 5 records (8 plants) had become 91 records. At this point treatment began, with the Environment Agency treating plants in May and September each year (weather permitting). We also removed 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. In interim years plants were found and treated downstream of Toft, but it seems these were removed before they had a chance to flower, and have not come back. The 2017 survey found 35 records (60 plants).

Future plans:

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


Giant hogweed 2002: 5 records (8 plants)
Wood Fm
Hardwick Wood
Wood Barn Fm
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Gill's Hill
Hall
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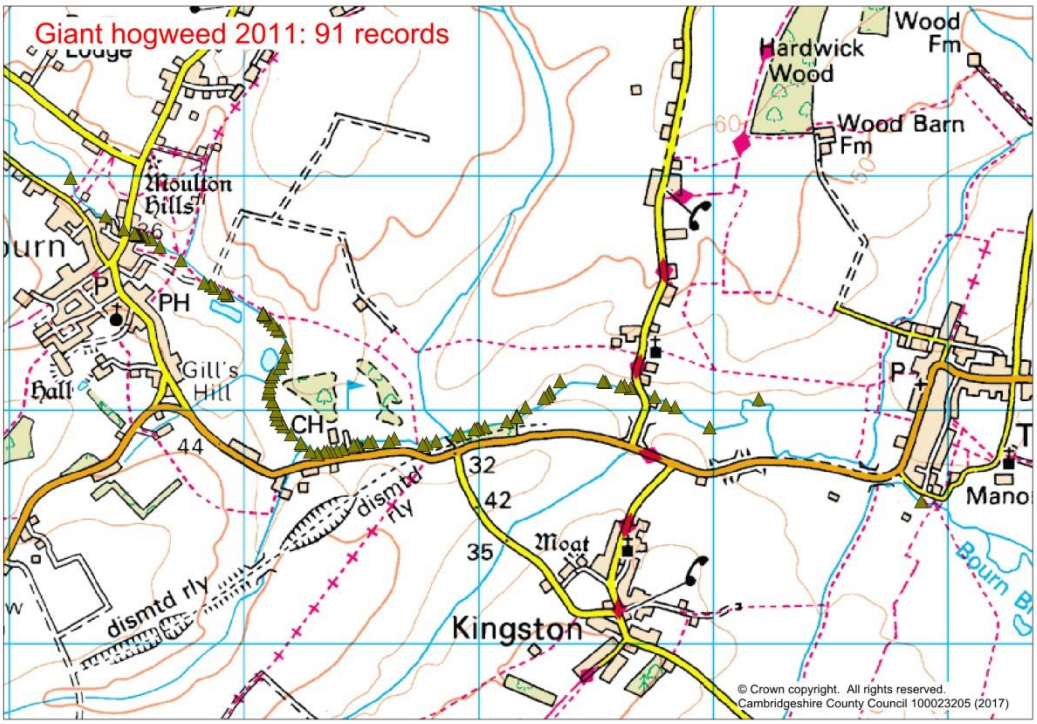
Giant hogweed 2011: 91 records
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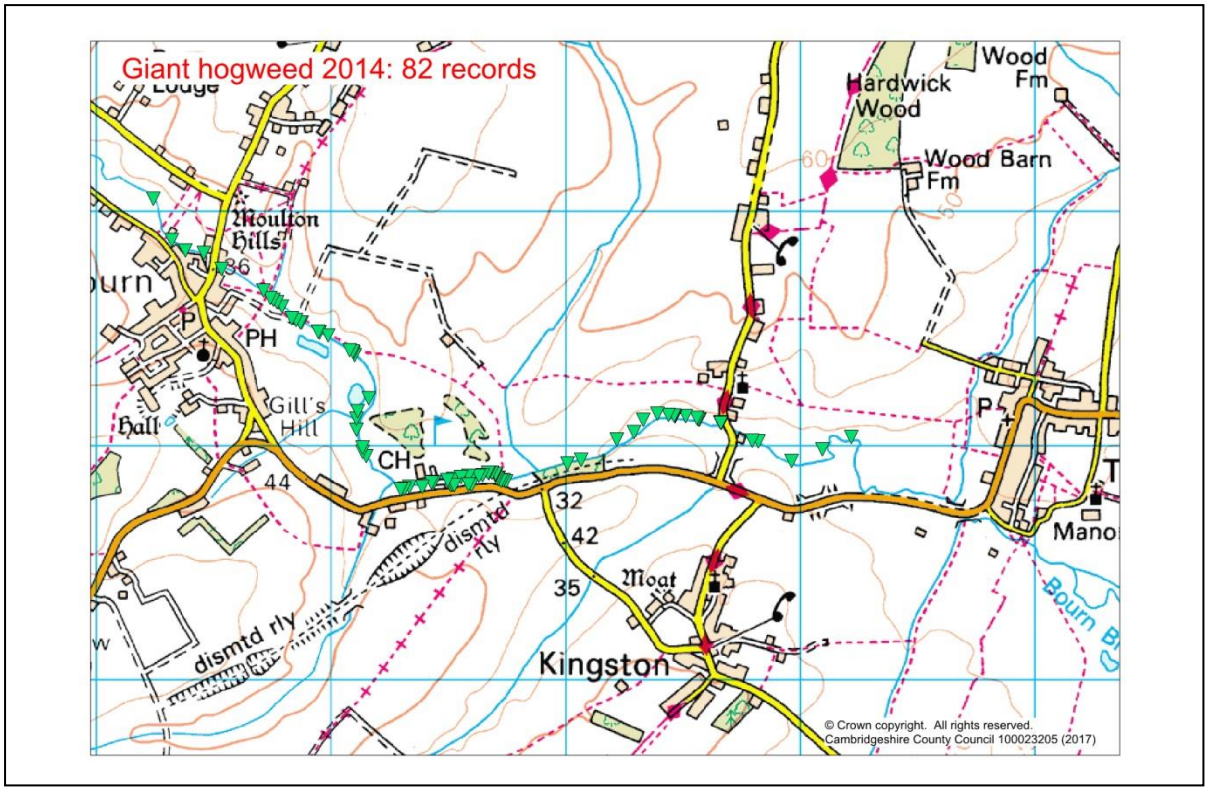
Giant hogweed 2014: 82 records
Hardwick Wood
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Wood Barn Fm
Moulton Hills
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Gill's Hill
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Kingston
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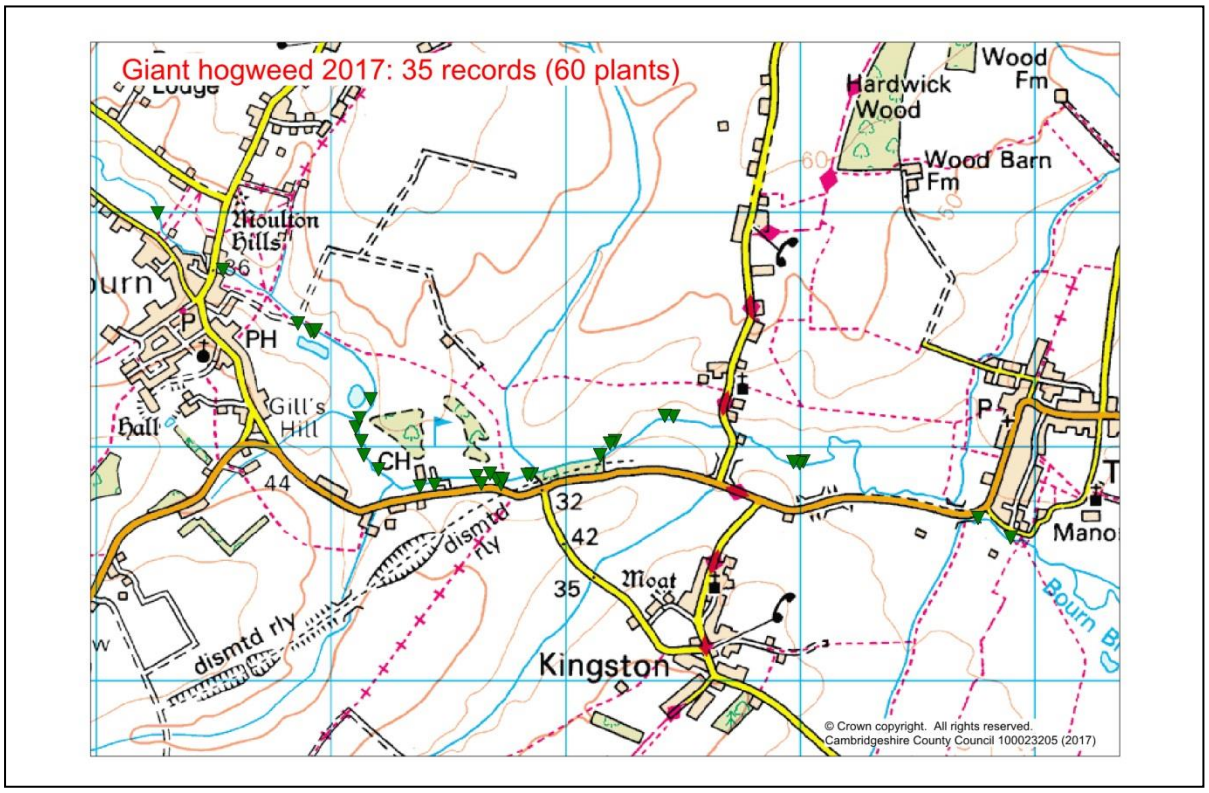
Giant hogweed 2017: 35 records (60 plants)
Hardwick Wood
Wood Fm
Wood Barn Fm
Moulton Hills
PH
Gill's Hill
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Kingston
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Himalayan Balsam Results

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 survey 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.

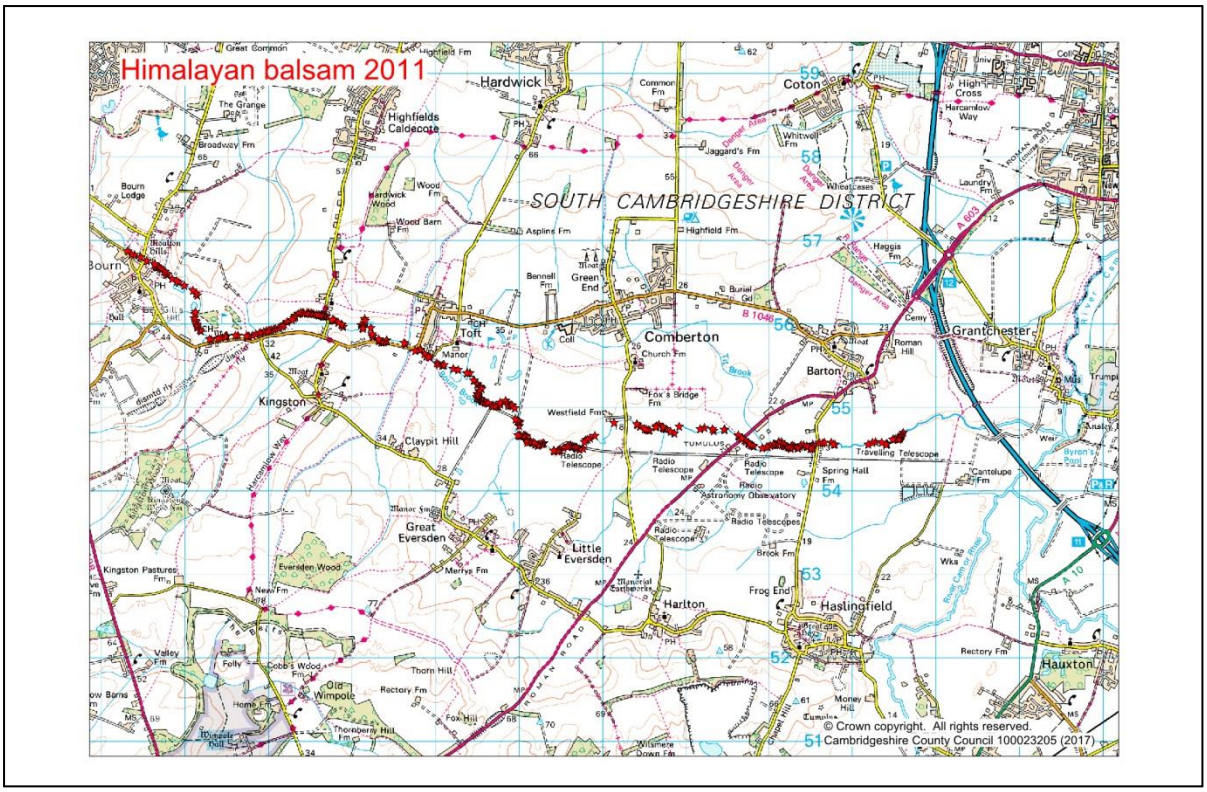
Young Himalayan balsam growing in a "huge" patch. Bourn Brook 2017.

The maps below (from 2011 and 2017) are not directly comparable, but they do illustrate some key points:

- The "huge" patches of balsam are almost exclusively on sections where no control occurred in the last couple of years. The upper of these sections had a relatively small amount of balsam in 2011, but control efforts stopped here in order to focus on the upstream areas. The implication is that had no control occurred, much of the brook would now have considerably more balsam. The lower section was not surveyed in 2011 but has had no control work.
- The upper stretch, particularly the golf course at Bourn, was one of the worst affected sections in 2011. It is also one of the most tricky to work on. Although the maps don't make it obvious, the number of plants seems to be reduced even here.
- Obvious reductions in the amount of balsam have occurred downstream of the Bourn golf course.

Future plans:

Continue to control balsam and re-survey in 3 years' time to see whether there has been a measureable change. Continue to focus on the upstream section and recruit local people to report any plants that were missed.


Himalayan balsam 2011
SOUTH CAMBRIDGESHIRE DISTRICT
Hardwick
Coton
Comberton
Barton
Grantchester
Kingston
Toft
Great Eversden
Little Eversden
Harlton
Haslingfield
Hauxton
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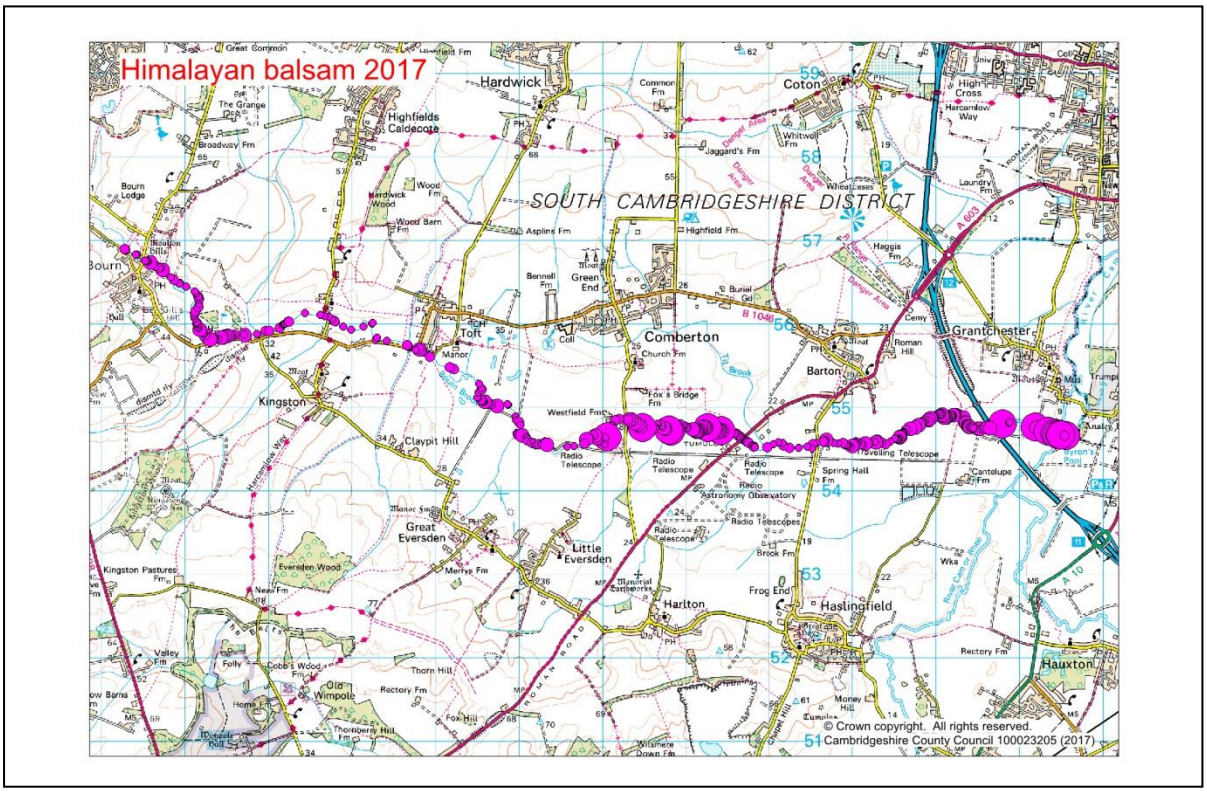
Himalayan balsam 2017
SOUTH CAMBRIDGESHIRE DISTRICT
Hardwick
Coton
Comberton
Barton
Grantchester
Kingston
Toft
Great Eversden
Little Eversden
Harlton
Haslingfield
Hauxton
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Water Vole Results

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^{o} angle and neatly stacked.

The maps below show the results of the three surveys.

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.

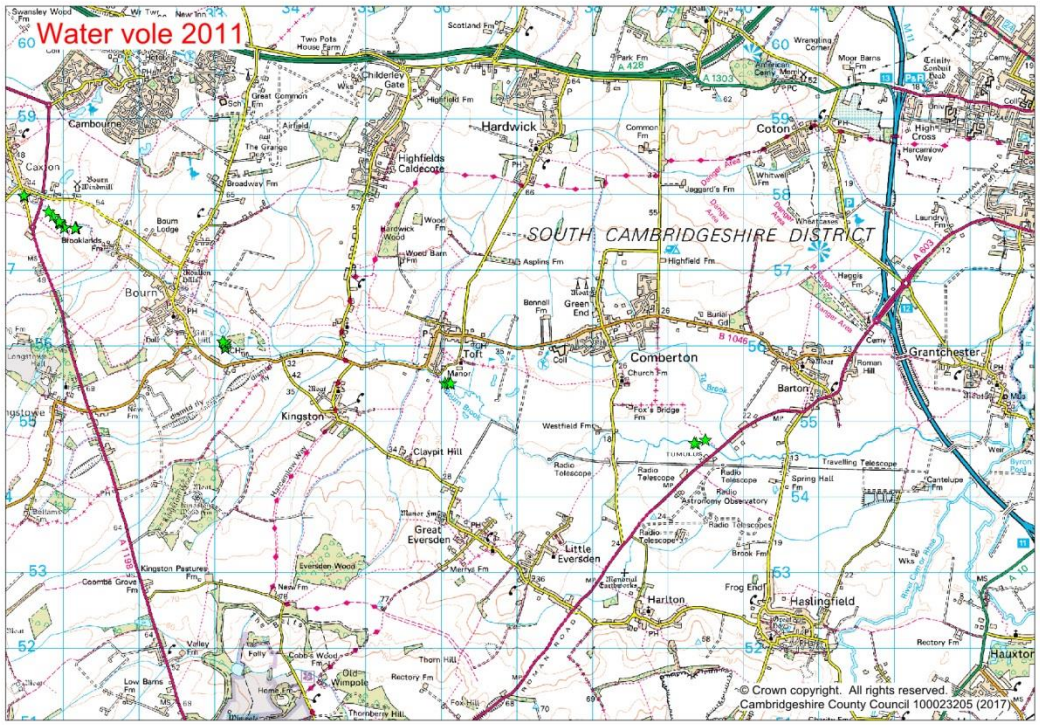
By 2017, water vole signs were present on most of the brook, now looking like a single population.

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 were noted, of birds such as moorhen and kingfisher, which also points to a reduction in the number of mink.

Mink have been reported trapped from ditches near the Bourn Brook. It is not clear whether they are having an impact on the water voles.

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.


Water vole 2011
SOUTH CAMBRIDGESHIRE DISTRICT
Hardwick
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Great Eversden
Little Eversden
Harlton
Haslingfield
Hauxton
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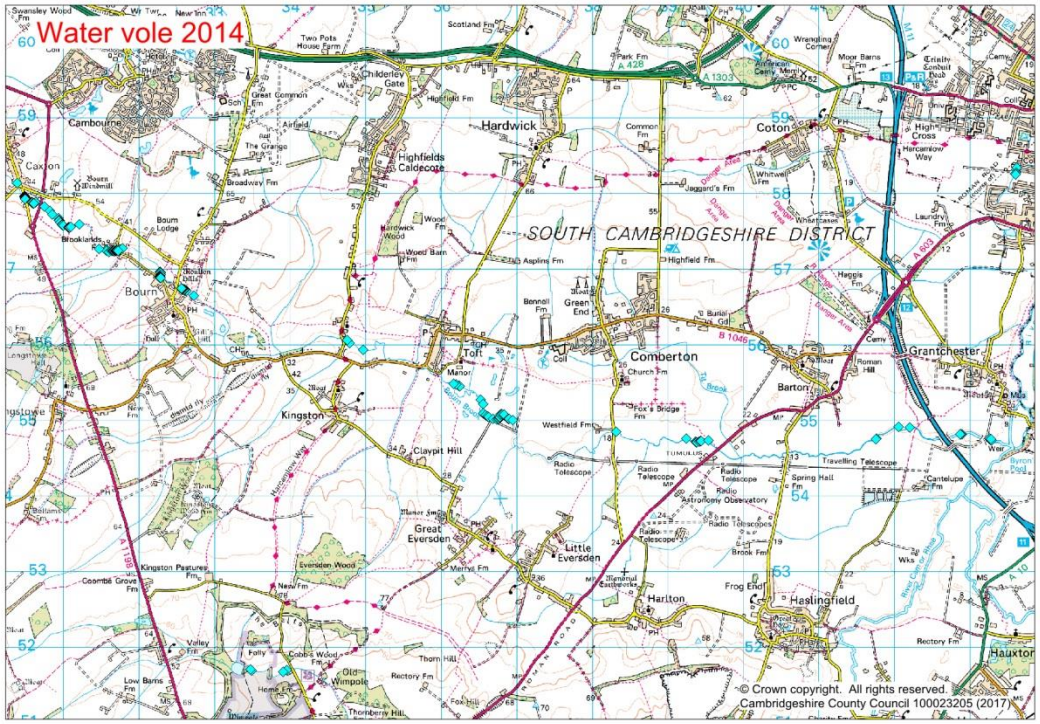
Water vole 2014
SOUTH CAMBRIDGESHIRE DISTRICT
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Great Eversden
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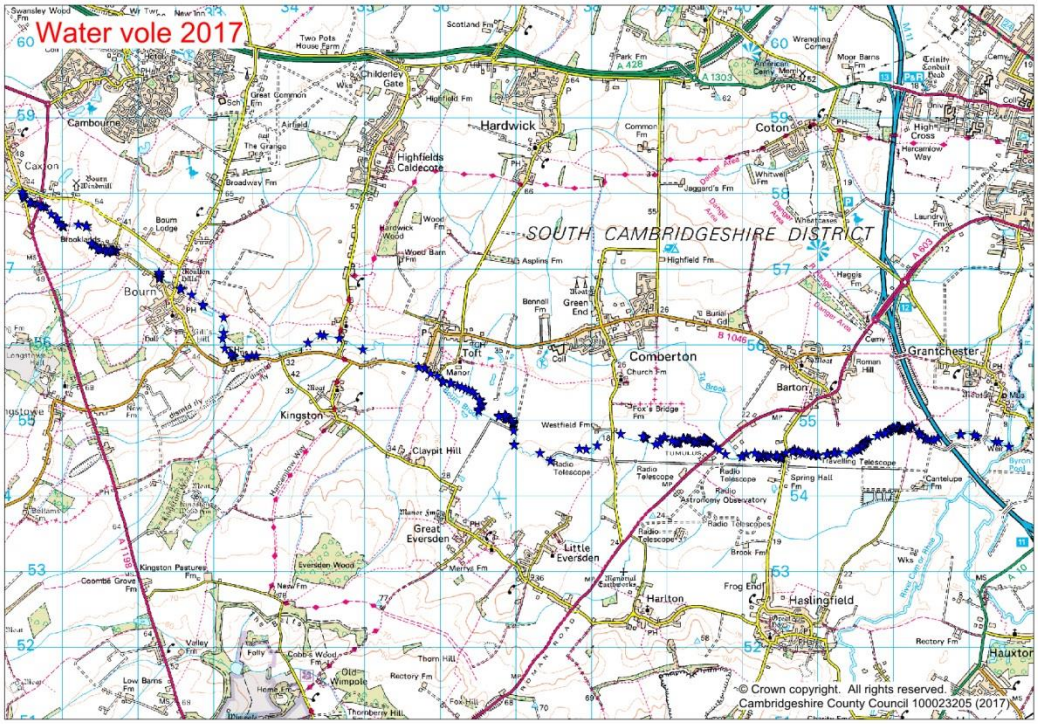

Summary of water vole sign records:

	2011	**2014**	**2017**
Latrines	2	38	157
Feeding remains	29	100	261
Droppings	1	33	190

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 has increased each time, with 11 records in 2011, 35 records in 2014 and 90 records in 2017. The reason for this increase is not clear, although it is known that an otter successfully reared cubs in the upper reaches of the brook in 2015. Reduced competition from mink can also benefit otters.

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

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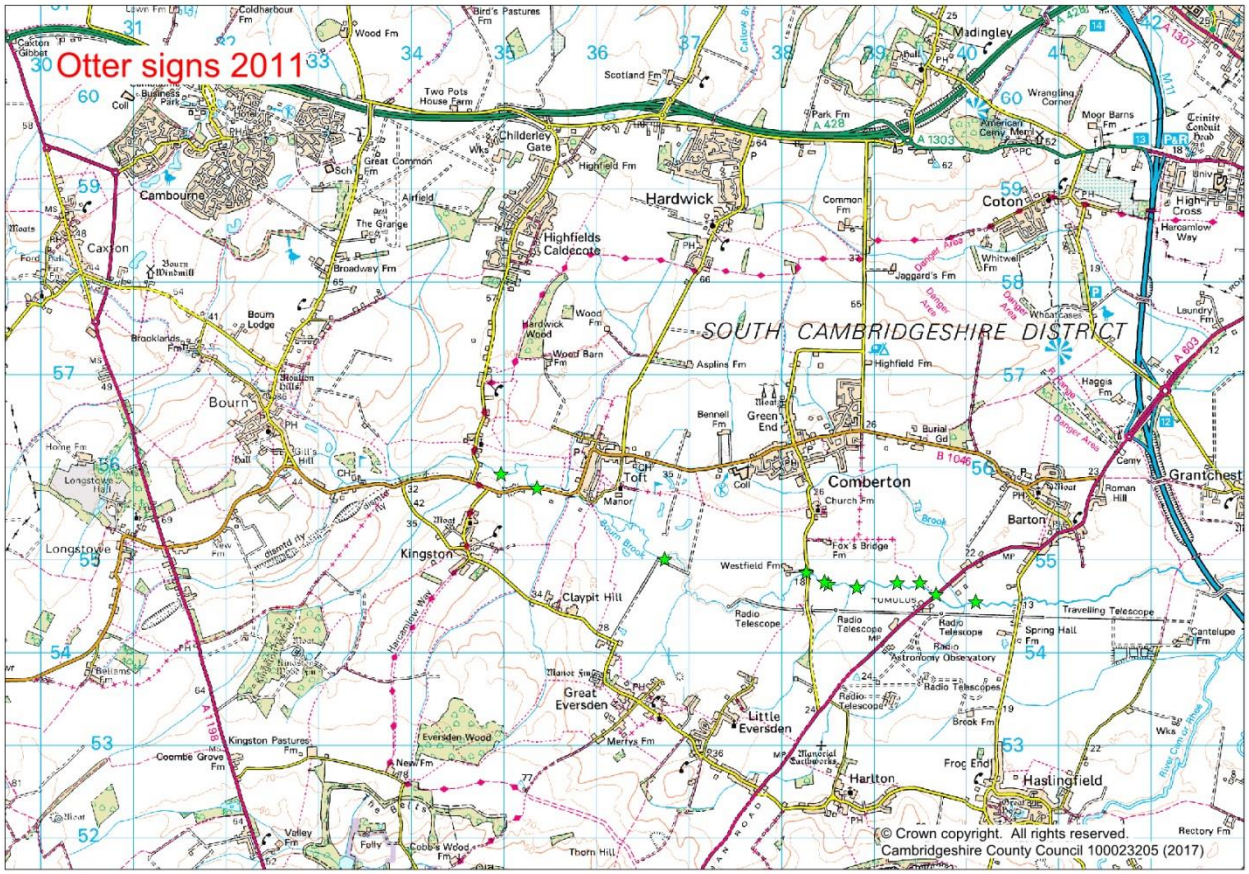

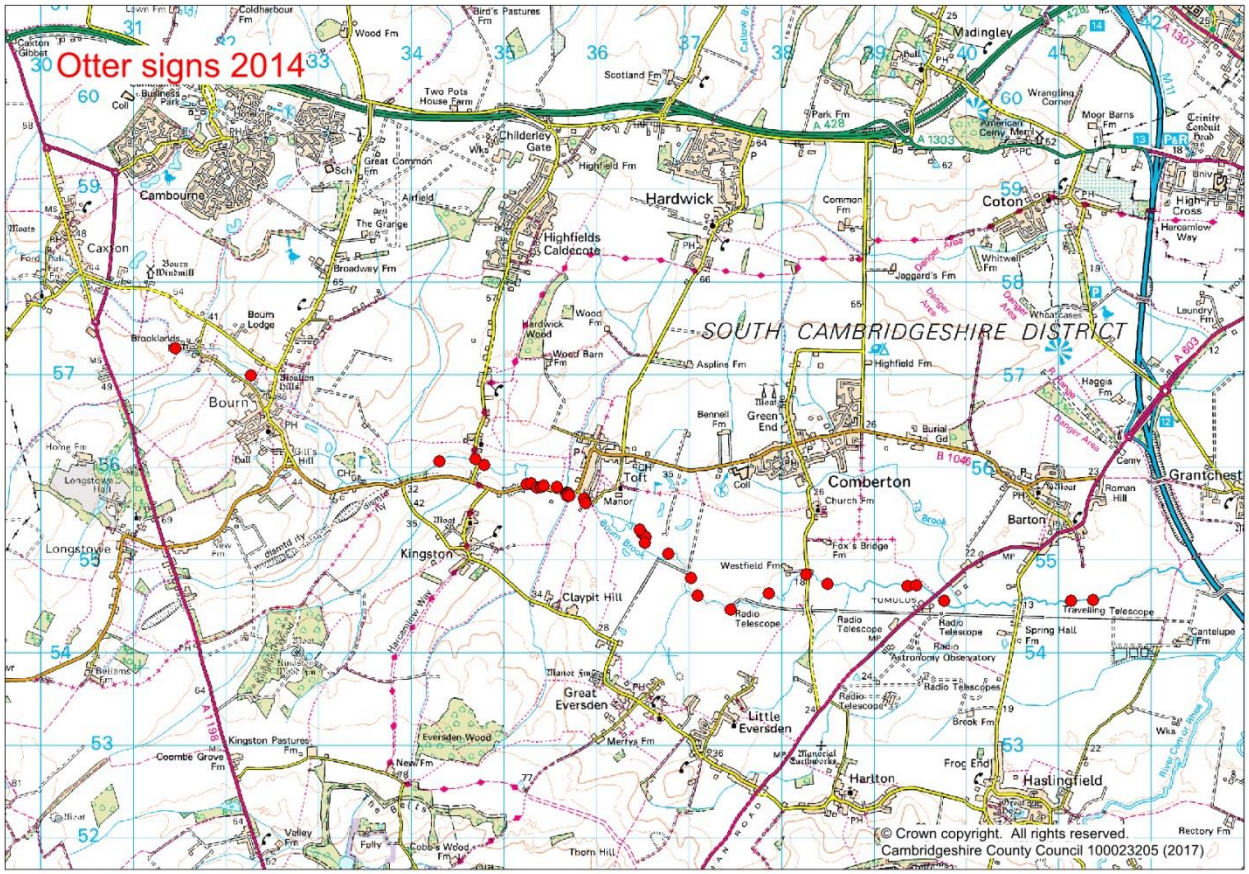
Otter signs 2014
SOUTH CAMBRIDGESHIRE DISTRICT
Cambourne
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Bourn
Hardwick
Highfields Caldecote
Kingston
Comberton
Toft
Coton
Grantchester
Barton
Madingley
Great Eversden
Little Eversden
Harlton
Haslingfield
Longstowe
Claypit Hill
Westfield Fm
Radio Telescope
Travelling Telescope
Spring Hall Fm
Cantelupe Fm
Rectory Fm
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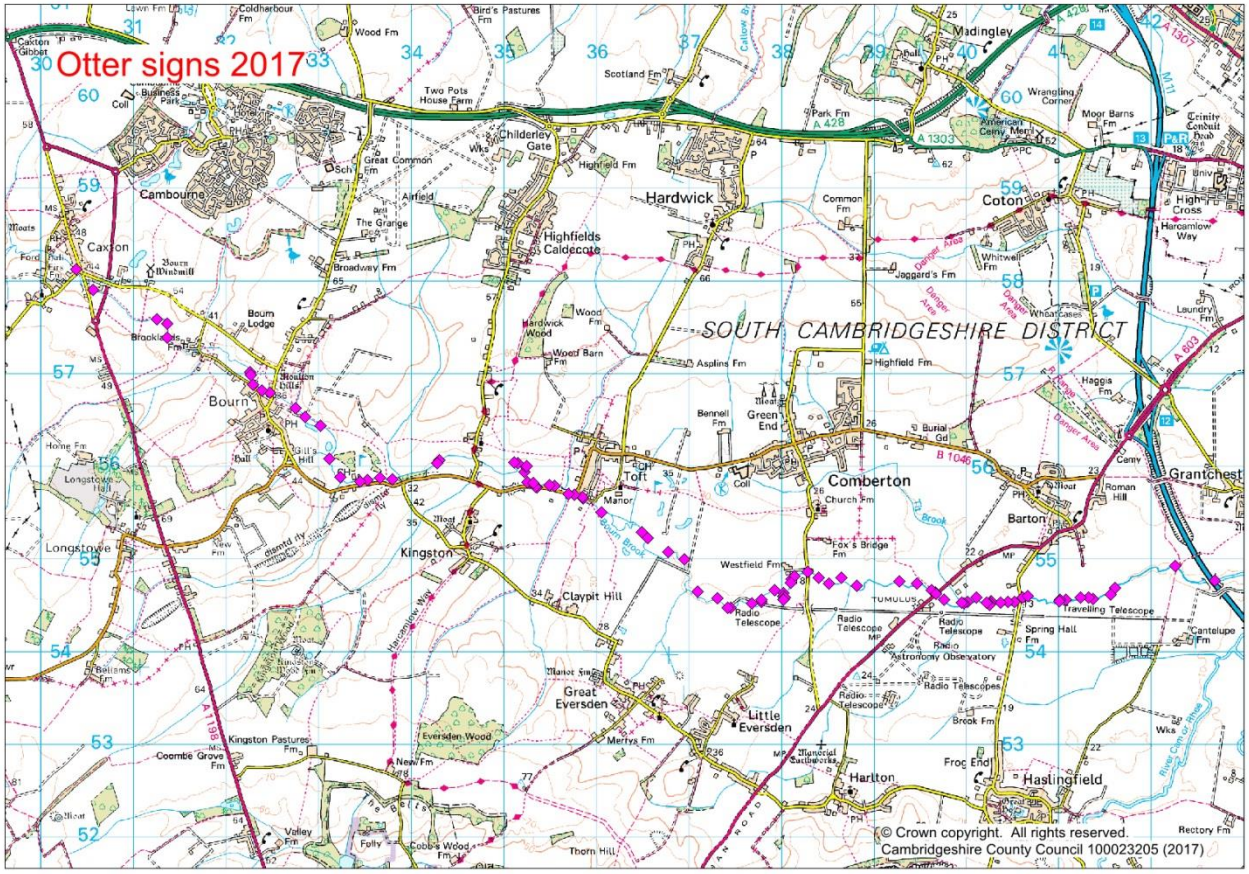
Otter signs 2017
SOUTH CAMBRIDGESHIRE DISTRICT
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Grantchester
Barton
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Claypit Hill
Westfield Fm
Radio Telescope
Travelling Telescope
Spring Hall Fm
Cantelupe Fm
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Summary

The work of the Bourn Free Project on the Bourn Brook is starting to make positive changes. The biggest of these is the increase in the number of water vole, correlating with a decrease in mink. Work tackling giant hogweed and Himalayan balsam is going more slowly, but is succeeding in reducing the number of plants.

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).

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 was to control American Mink. American 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. This success is reflected in the recovery of water vole and moorhen on the brook.

The second phase of the project was to tackle the invasive plants giant hogweed and Himalayan balsam. Our control measures are already 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. 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 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 been cut off by the NRA. 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 has is also in its early stages, with the aim of producing a map of potential projects.

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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.

It 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.

Mechanical controls with the appropriate precautions can be implemented but cutting before flowering will produce only temporary control and ensures that the plant re-grows the following season. Small infestations can be controlled by digging out the whole plant but larger areas will require considerably more effort and is difficult to do on riverbanks. Cutting through the stem should be done below ground level to ensure damage to the rootstock and subsequent plant growth.

Chemical control can be used but the chemical must be approved for use near water and the appropriate permissions granted. It can also only be administered by trained operatives.

There is no known adequate biological or environmental control as yet.

Action taken early rather than later should be encouraged as it may take a number of years to adequately control the problem depending upon the extent.

Two of the most important points to remember about management of Giant Hogweed are that control measures will only affect those plants which have already germinated and that viable seeds may continue to germinate each year. Eradication, as opposed to a temporary control, therefore requires annual checks ensuring any germinating plants are controlled before they can seed. Another important point is that seeds from the plant are almost certainly washed downstream and spread into new areas. So attempts to eradicate this plant are unlikely to succeed unless control is exercised along the whole watercourse where the giant hogweed is present.

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 said to be 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.

In terms of control, mechanical control can be undertaken but in some inaccessible areas it may be impractical. Unless the plant is pulled up from its root or cut below the lowest node, it will re-grow and flower later in the season. Small infestations can be controlled by hand pulling as the plant has shallow roots which can be easily uprooted. Approximately two years of control theoretically should eradicate the plant from the area. However, as with Giant Hogweed the effectiveness of certain controls depends of a number of factors.

Chemical controls can be used, although this is generally only recommended for stands too large to pull by hand. The plants should be sprayed in the spring before flowering but late enough for germinated seedlings to be seen to be sprayed. In this case, the chemical would need to be approved for use near water and the appropriate consents obtained.

There are no known effective biological or environmental controls other than to reduce germination of new seedlings through other plants e.g. dense grass sward.

The most important point to remember is that attempts to eradicate this plant are once again dependent on control being exercised along the whole watercourse where the plant is present. It is best to control moving from the upstream to downstream. There are positive examples of catchment wide control working effectively.