Advisory Visit

Cherry Hinton Brook, Cambridge

18th July 2017

1.0 Introduction

This report is the output of a site visit undertaken by Rob Mungovan of the Wild Trout Trust to the Cherry Hinton Brook on 18th July 2017, a subsequent visit was made on the evening of 24th July to explore the brook's lower reaches and connection to the River Cam. Comments in this report are based on observations on the day of the site visits and discussions with Guy Belcher, Cambridge City Council's Ecologist.

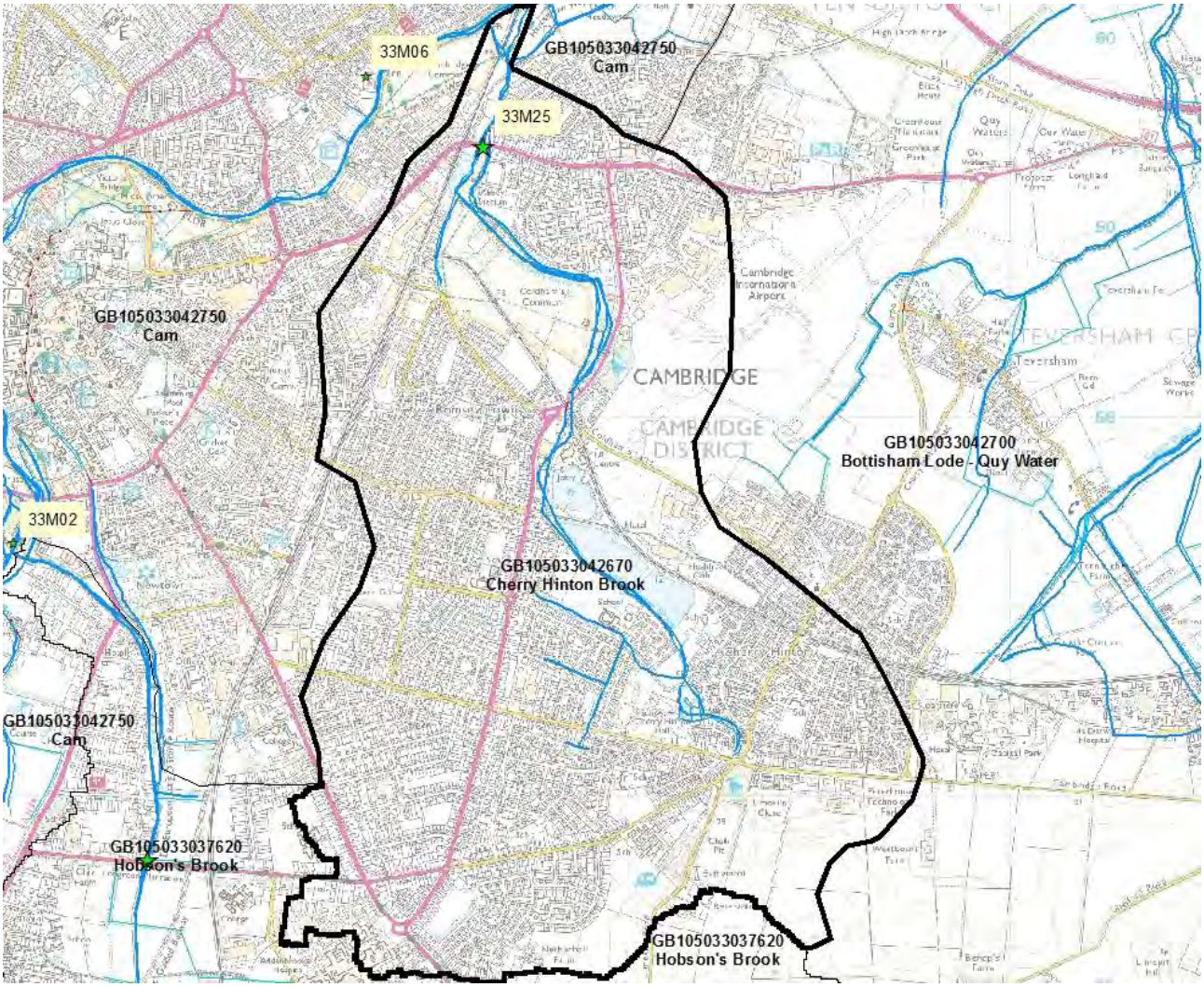
The positive management and restoration of the Brook are primary objectives of the local conservation group, the Friends of Cherry Hinton Brook. This report will be reviewed, and hopefully, implemented by the Friends.

Note that this report does not follow normal convention in so far that all pictures (unless stated) are taken looking upstream. This was necessary in order to enable the visit to be undertaken whilst moving upstream into non-turbid water.

2.0 Catchment and walkover observations

River	Cherry Hinton Brook
Waterbody Name	Cherry Hinton Brook
Waterbody ID	GB105033042670
Management Catchment	Cam and Ely Ouse
River Basin District	Anglian
Current Ecological Quality	Moderate
U/S Grid Ref inspected	TL48255 56473
D/S Grid Ref inspected	TL 47246 60080
Length of river inspected	3.78km

Table 1 – watercourse attributes



Map 1 – The catchment and general location of the Cherry Hinton Brook

The Cherry Hinton Brook rises from chalk springs at Giant's Grave, Cherry Hinton and flows in a northerly direction through an increasingly urban catchment.

On many maps the lower parts of the Cherry Hinton Brook are referred to as the Coldham's Brook. In this report the Cherry Hinton Brook shall be the channel that runs from Cherry Hinton Hall, along the rear of Whitehall Road, Cambridge, and then adjacent to the Abbey Stadium (Cambridge United football club) to terminate at Newmarket Road. The Coldham's Brook shall be the channel that emerges from an underground pipe at the Sainsbury's roundabout (TL47686 58134). The upper parts of the Coldham's Brook are also referred to as the East Cambridge Main Drain on some older maps. See maps 2 and 3 for watercourse and locations.

Map 2 – Upper location of the Cherry Hinton Brook and Coldham's Brook

Map 3 – Lower location of the Cherry Hinton Brook and Coldham's Brook

The Cherry Hinton Brook falls within the East Anglian Chalk National Character Area and then crosses over into the Bedfordshire and Cambridgeshire Claylands National Character Area. www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles#ncas-in-the-east-of-england

The East Anglian Chalk is the continuation of the narrow chalk ridge that runs south-west–north-east across southern England. The underlying geology is Upper Cretaceous Chalk, and Jurassic Cretaceous clays, overlaid by more recent glacial deposits of chalky boulder clay, and sand and gravel river terrace deposits within the river valleys.

The porosity of the chalk geology is one of its most noticeable features. Rain moves through the thin soils and slowly replenishes the chalk aquifer below being absorbed through tiny, connected pores and natural fractures, instead of creating surface run-off into rivers and/or ponds. The chalk aquifer is abstracted for water to supply Cambridge and the surrounding area.

The Bedfordshire and Cambridgeshire Claylands is a broad, gently undulating, lowland plateau dissected by shallow river valleys that gradually widen as they approach the Fens. The River Great Ouse and its tributaries meander slowly and gently across the landscape. The River Cam flows into the Great Ouse which flows into the Wash.

Extensive quarrying of sand and gravel within the river valleys has left its mark with a series of restored and flooded waterbodies that benefit biodiversity and recreation.

There are no active fishing clubs on the Cherry Hinton Brook, although angling takes places in a number of lakes along it. No official records of fish introductions to the brook are known, although fish appear to have been introduced in the past. There are reports of a goldfish (not seen) and a number of dace and chub were seen (at ~20cm length) during the visit - their natural origin in the brook is questionable due to the poor habitat.

Picture 1 – a shoal of dace and small chub observed at Coldham's Common. These fish are believed to have been introduced to the brook as they would not typically be found in slow silty reaches. It is doubtful that this species could breed in the brook.

A small shoal of minnows (~20) were observed near Barnwell Road (TL 477703 58184) and it is possible that they do sustain a small population within the brook. No trout were observed.

The total length of the Cherry Hinton Brook from the lake at Cherry Hinton Hall to its termination at Newmarket Road is 3.78km. If a measure is then taken from the Coldham's Brook (where it continues from the Cherry Hinton Brook's termination) there is a further 0.72km of watercourse.

The Cherry Hinton Brook is classified as a heavily modified watercourse under the Water Framework Directive (WFD). This is certainly evident from the straightened nature of the channel, its crossings of the Coldham's Brook and its culverted reach taking it beneath the railway line and Barnwell Road.

The Cherry Hinton Brook is classified as having an overall ecological potential of Moderate (2015 baseline). Investigation of water quality issues in the brook by the Environment Agency have identified problems with low dissolved oxygen levels and high levels of dissolved ammonia. There are only two discharge permits to the brook, both of which are for surface

water discharges. There are no known sewage discharges to the brook. However, there have been several incidents relating to oil pollution.

Picture 2 – oil residue (red arrow) present immediately below a surface water outfall (at the downstream end of the Sainsbury's car park but not necessarily emerging from their site).

Environment Agency investigations in 2009/2010 detected a correlation between low dissolved oxygen concentrations and elevated ammonia concentrations. The low flow rates were also considered to compound the low oxygen levels. It is believed that ammonia is leaching into the brook at times from nearby contaminated ground. This point of concern clearly needs to be raised with the EA by the Friends of Cherry Hinton Brook as it poses a real ecological threat.

There are no statutory designations on the Cherry Hinton Brook but it is recognised as a City Wildlife Site by Cambridge City Council. This designation may be advantageous when considering restoration and the possible use of funding through planning gain (S106 funds).

It was evident that water voles are widespread along the brook; their droppings and feeding stations were observed at many locations. A number of animals were seen when walking upstream from Sainsbury's towards

Burnside. Water voles and their habitat receive full legal protection under the Wildlife and Countryside Act 1981.

Picture 3 – lush emergent vegetation providing excellent cover for water voles in the reach from Sainsbury's towards Burnside.

Two very old otter spraint were found one on a log where the public footpath enters Coldham's Common and another beneath the Sainsbury's car park bridge. This is not surprising as otters have successfully re-established in the Cam catchment and are utilising many small streams to navigate the county. It is doubtful that otter would spend any great length of time on the brook due to its low fish numbers but otters will eat other prey items such as water fowl, small mammals and amphibians. Otters and their habitat receive full legal protection under the Wildlife and Countryside Act 1981.

Picture 4 – an old otter spraint found on the log that is immediately upstream of the bridge that leads the public footpath into Coldham's Common.

3.0 Habitat Assessment

The brook is being influenced by a range of pressures, some of which combine to further compound their influence. These pressures are:

- Low flow
- Poor habitat
- Poor water quality events
- Siltation
- Lack of connectivity

At the time of the visits the brook did not flow to meet with the River Cam (nor the Coldham's Brook) but became dry in the vicinity of Galfrid Close, Cambridge. It was generally dry at the rear of Whitehill Close (except for run-off during a rain storm) and then started to hold water again in the vicinity of the Abbey Stadium (Cambridge United football club).

Picture 5 – flow in the Cherry Hinton Brook reducing at Galfrid Close.

Picture 6 – the Cherry Hinton Brook finally dries in the vicinity of Whitehill Close.

The channel at the rear of the stadium was little more than a drainage ditch with no perceptible flow.

Picture 7 – the Brook's channel holds water again near to the football stadium but is more akin to a ditch rather than a small chalk river.

The channel appeared to terminate at Newmarket Road where historically it would have delivered water to the mill that can be seen from Ditton Walk. It has been stated that a pipe connection exists from the Cherry Hinton Brook to the lower cut Coldham's Brook (pers. comm. Ms Vic Smith, Cambridge City Council August 2017).

Picture 8 - a former mill building seen from Ditton Close suggesting that the Cherry Hinton Brook once carried enough water to power a mill.

The Coldham's Brook joins the River Cam immediately upstream of the railway crossing at TL 47246 60080. The Coldham's Brook appears to have unhindered passage from the Cam along its entire length to where it emerges (it should be noted that the culvert beneath Newmarket Road was not visited), thus if the Cherry Hinton Brook could be diverted in to the Coldham's Brook there would be connectivity of these watercourses to form a larger body of water that would have far greater ecological potential and resilience.

Picture 9 – the confluence of the Coldham's Brook with the River Cam

Picture 10 – good flow was evident over a shallow gravel bed on the Coldham's Brook. Note the invasive Himalayan balsam plant.

The Coldham's Brook captures the flow of the Cherry Hinton Brook by being cut into the land at a lower level, and by then draining the land around the Cherry Hinton Brook, and by capturing direct seepage from the higher level Cherry Hinton Brook. This effect is particularly evident near Galfrid Close where the Cherry Hinton Brook crosses the Coldham's Brook.

Picture 11 – note the deeply cut channel of the Coldham's Brook near to its emergence from beneath east Cambridge. The channel has been cut down into the chalk strata with chalk nodules and small flinty gravels present. A stone loach was observed.

Land use adjacent to the brook has become increasingly urban in the last 90 years. The village of Cherry Hinton has become a suburb of Cambridge; new roads have been constructed over and adjacent to the brook, and farmland has been built upon. There are now many houses in close proximity and a Sainbury's supermarket abutting the brook with the car park either side of it. A number of what are assumed to be storm water outfalls were observed with none showing any gross signs of pollution. Oil residue was observed at one location only (see picture 2).

The brook had been visited during a period of heavy rainfall but it was surprisingly clear. As such it is assumed that it only receives a limited amount of direct run-off from urban features such as roads. This is

encouraging as urban run-off typically introduces hydrocarbon and silt pollution, and an unnaturally erratic flow regime.

The brook is quite heavily tree lined in many places and as such a dense canopy limits light penetration. As a consequence in places, the banks are bare of understorey vegetation which is allowing sediment to be washed in from the banks of the channel as they are subject to slow erosion over time.

Picture 12 – the Cherry Hinton Brook is almost totally shaded where the public footpath enters Coldham's Common.

Picture 13 – the Cherry Hinton Brook is partially shaded but suffering from excessive siltation within Coldham's Common as it approaches Galfrid Close (where it becomes open it is then entirely choked by reeds).

Picture 14 – Cherry Hinton Brook along Snakey Path, no vegetation is present on the bank beneath the black thorns. Allowing light to reach the channel would bring benefits to the brook.

Where the channel is unshaded it supports some very extensive stands of emergent vegetation. Of most note is the reedmace (*Typha latifolia*) at Burnside and the common reed (*Phragmites australis*) at Coldham's Common. It is reported by Cambridge City Council (Pers. Comm. G.Belcher Aug 2017) that the brook is the subject of an annual partial weed clearance by contractors to create a sinuous path through some retained marginal vegetation.

Picture 15 – the channel of the brook is choked by common reed in Coldham's Common.

Picture 16 – the channel of the brook is partially choked with reedmace at Burnside.

Much of the brook is devoid of any veteran trees suggesting that clearance for maintenance purposes has taken place and has maintained the brook so. Where trees are being retained they are generally not much greater than 30 years of age and often consist of sycamore and elder. A lack of mature trees reduces the availability of large woody debris (LWD) an important component within rivers for driving of scour and sediment transfer, as well as being an important habitat features itself. The oldest stand of trees appeared to be mature hawthorns present on Coldham's Common.

Marginal and aquatic plants provide colour and interest to the brook but none observed where of any notable botanical interest. However, the presence of marginal and aquatic plants is of great value to many fish species and invertebrates. The main species observed were lesser water parsnip (*Berula erecta*), woody nightshade (*Solanum dulcamara*), water forget-me-not (*Myosotis scorpioides*), lesser pond sedge (*Carex acutiformis*), common reed, brooklime (*Veronica beccabunga*) and starwort (*Callitriche sp*).

Picture 17 – the brook nearer to Cherry Hinton exhibits some shallow and faster moving areas. These reaches would be a suitable to undertake hand weed cutting within.

The morphology of the brook has been significantly altered for both land drainage and water milling. Subsequently, the brook (excluding the reach in the vicinity of Cherry Hinton Hall) has been heavily maintained and dredged for the vast majority of its length. Only at a limited number of bridge locations could the natural bed of gravel be found.

Picture 18 – note the firm gravel bed beneath the original road culvert in the vicinity of Sainsbury's. This observation is important as it shows that the brook did once have a gravel bed (at least in places).

Picture 19 – note the extremely low head-room beneath the Sainsbury's culvert. Features such as this represent significant obstructions to flow. Furthermore, the presence of bridges with low-head clearance is typical on chalk rivers not prone to high flows.

Whilst it is quite common for the channel of chalk rivers to be modified, the Cherry Hinton Brook is highly modified to the extent where it no longer has connection to its floodplain. The brook's long profile is stepped between the fixed points of road culverts; this has reduced channel gradient and stream power. There were no natural pools or riffles (but a number have been created and/or enhanced as a result of recent habitat improvement works by the Friends of Cherry Hinton Brook).

The low gradient of the brook means that it has minimal power to scour silt from the bed or create under-cut banks. There was no evidence of eroding banks that could supply coarse material to aid the recovery of natural processes. As such the channel has extensive fine sediment covering its bed, and the over-dredged channel has little flow diversity to drive forward processes of erosion and deposition, and the subsequent downstream translocation of coarse substrates to form ecologically diverse in-channel features such as riffles and marginal berms.

A number of culverts cause impoundments to flow. The most notable was that at Burnside (picture 20) where the channel has been deepened to flow beneath it but has consequently silted up resulting in a channel depth of over 1.3m but with only ~0.3m of open water.

Picture 20 – note the depth beneath the level bridge at Burnside. Digging the channel deeper would not help move flows along this reach.

It is reported by the Friends of Cherry Hinton Brook, and people spoken to during the visit, that the flow regime does not alter significantly. This was surprising as one would expect a much stronger winter flow especially in wet periods. However, given that the chalk aquifer beneath Cambridge is heavily abstracted it may be possible that the brook is flowing at its low base rate flow more or less all year round. The urbanised nature of much of its catchment may significantly reduce the natural seepage of rainfall that would contribute to increased winter flows because much of the storm run-off appears to be directed to sewers. However, that diversion of storm flows tempers peak flows that would otherwise have provided the power to scour and mobilise silts.

Due to the narrow nature of this urban watercourse there was no extensive LWD retained in the channel. Fallen wood within channels is a natural and important component of rivers. Woody material provides increased surface areas for bacteria, algae and invertebrates to start the process of nutrient transfer and the breakdown of organic matter. Woody material can also provide cover for a wide range of species (both aquatic and terrestrial). And where other organic material, such as leaves, builds up against such features, it creates flow diversity, which in turn mobilises sediment to be transferred along the channel or to be trapped by the root systems of plants.

It was very encouraging to see the extensive habitat improvement works that have been delivered by the Friends of Cherry Hinton Brook with support from both Cambridge City Council and the Wildlife Trust. The brook is in clear need of habitat enhancement and restoration if it is to improve its ecological status under the WFD. Improvement of this brook could continue to bring urban communities together and encourage people to take pride in their local environment.

Habitat improvement techniques that have been deployed to date include paired A-wing flow deflectors and pre-planted coir rolls (the improvement of the channel at Cherry Hinton Hall in 2012 by Cambridge City Council is not the focus of this report).

The paired A-wing flow deflectors are having a local effect in so far that they are creating some scour immediately downstream. However, on low gradient watercourses flow deflectors which raise the bed are undesirable as any improvements created by the scour are likely to be negated by the impoundment created and increased siltation upstream. The lower the

gradient, the greater the impact of even a small impoundment and consequential deposition of fine sediment behind the impoundment. Furthermore, the impounding effect may not be recognised as an issue for many years, whereupon persons have become attached to the feature created and can become reluctant to adjust or remove them.

Picture 21 – view of A-wing flow deflectors adjacent to the Sainsbury's car park. Note that this reach has gradient and a fall between the structures can be observed.

Picture 22 – note the large sized gravel used to backfill the deflectors. The grade of stone is allowing a significant proportion of the flow to move through the deflectors rather than over them. This is reducing the deflectors' effectiveness and actually dissipating some of the flow.

Picture 23 – note the depth of ~0.4m upstream of the deflector and the dense stand of reed which will only benefit further from such impoundments.

A-wing flow deflectors effectively create mini-weirs and can act as barriers to fish movements particularly in periods of low flow. This is a significant problem if fish need to move up or downstream to escape the effect of a pollution discharge. There is a real risk that the fish in the brook are restricted in their range by the A-wing flow deflectors.

Picture 24 – flow deflector with debris against it causing water to be pushed through the stones. This type of feature would act as a barrier to fish movement.

Picture 25 – with a little adjustment of the debris the brook's flow can be centred back in the channel where it can energise the pool. Simple maintenance of such structures is needed.

Whilst the work to date is commended, it is strongly urged that a review of the deflectors be undertaken (with the author) to identify how they could be adjusted to create more ecologically and geomorphologically beneficial flow conditions. This could be as simple as adjusting the form of deflectors by redistributing gravel or adding some smaller particles to increase their water-tightness (preventing the flow of water through the gravel and pushing it over it). The main objective would be to ensure that no structure impounds the flow.

One deflector in particular had encouraged development of a long gravel run (picture 26). Consequently this feature demonstrates how bed raising using gravel could be more advantageous to the brook overall in so far that it would still provide local areas of scour, provide ecologically important riffles and would increase the ability of the brook to transfer fine sediment along its channel.

Picture 26 – note how the placement of gravel upon the bed over a distance of ~5m has shown how more extensive bed raising could bring about restoration of the brook.

The use of pre-planted coir rolls has greatly increased the diversity of marginal plants and created an attractive edge to an area of revetted bank (in the vicinity of the Sainsbury's car park). This could be continued but a degree of caution should be exercised. If the rolls are not located in full sunlight the ability of the plants to grow through the coir rolls and to take

root in the bank can be reduced. If the plants die back (or get eaten by water voles) then bare coir rolls would be left.

Picture 27 – note how the use of pre-planted coir rolls (shown by arrow) has delivered effective and attractive screening of the hard wood and stone revetments (when undertaken in areas with adequate sunlight).

The brook currently exhibits very poor habitat for brown trout and there are a number of issues that are essentially population bottlenecks to trout that need to be addressed:

- Spawning habitat – there was clean gravel in the vicinity of Cherry Hinton Hall as a result of habitat improvement work in 2012. However, the Hall is subject to intensive recreational pressure (such as children and dogs entering the brook) which could directly impact upon any trout eggs laid amongst the gravel (and would be vulnerable for the period December through to early April)

- Fry habitat – if trout eggs were to hatch then the emerging trout, referred to as fry, would require areas of relatively shallow water with extensive and complex marginal cover. It is not known if any such cover is retained in the winter following the annual maintenance of the channel. It is likely that some would

be present but due to the impounded nature of much of the brook these areas would be limited thus introducing competition between fry.

- Parr habitat – juvenile trout (or parr) typically occupy shallow riffles separated from adult trout which tend to favour slightly deeper water. There were no riffles.
- Adult trout – such fish are quite adaptable and can occupy any clean waterbody that provides for all of the life-stages above along with deeper water refuge areas. The brook currently offers few deeper areas and has no direct connection to the Coldham's Brook or Cam. Water depth could be found beneath some bridges but they were often impounded and deeply silted.

At present the brook is not considered to provide many of the necessary components required to support to sustain a wild trout population. However, that is not to say that it should not be an objective of the Friends to establish a wild brown trout population. To have such an iconic species in a Cambridge city river would be a truly welcome sight and one that would show a healthy environment.

Picture 28 – the lower reaches of the Coldham's Brook exhibit relatively swift flows, a gravel bed and an attractive balance of tree cover and more open areas. Trout are more likely to be present within this reach than elsewhere within this watercourse.

4.0 Recommendations

To recap, the key issues identified were:

- Low flow
- Poor habitat
- Poor water quality events
- Siltation
- Lack of connectivity

Low flows

The Friends should ensure that communication is maintained with bodies such as the Environment Agency, the City Council and the water company with regard to lobbying for improvements when reviews of licences and/or practices are changed. The establishment of a minimal acceptable flow for the brook should be discussed with the Environment Agency and the water company (now South Staffordshire Water, was previously Cambridge Water Company).

Poor habitat

This issue is arguably the easiest to address. Much effort has been put in to the installation of A-wing flow deflectors. These features are having mixed results and no further A-wing deflectors should be delivered until their upstream impact has been more carefully assessed. A plan of adjustment is likely to be required to alleviate the flow impoundment currently being created and to improve their performance.

A basic tree-shade survey should be undertaken to identify reaches of the channel that might benefit from increased light penetration. Tree management in urban areas can be a sensitive issue and full liaison with Cambridge City Council, and possibly local residents' groups, would be needed. The tree-shade survey may even identify some reaches that could benefit from further tree planting. For example, willows may be beneficial for their quick growth and ability to consolidate marginal silt. The planting of new willow trees may enable a future stock of pollard willows to be grown (which are very typical of the Cambridge landscape).

Any tree management along the course of the brook should be seen as an opportunity to firstly allow light to the channel, and secondly to provide a source of brushwood material to be used for habitat enhancement. Dialogue

should be had with Cambridge City Council to see if any tree works are planned for the immediate future and whether there might be any location(s) along the brook where such cut material could be temporarily stored.

Picture 29 – the effect of shade caused by the tree is evident by the lack of vegetation beneath it.

Poor water quality events

Poor water quality and pollution events pose a risk to the brook. Awareness of water quality threats should be raised within the local community. The Riverfly Partnership exists to train communities to undertake invertebrate monitoring and allows groups to establish a baseline score for a river based on eight key invertebrate groups which are easy to identify. If future monitoring reveals an absence of invertebrate groups, or a score drops to a pre-agreed threshold, then this point of concern can be taken to the Environment Agency who may investigate it in greater detail. More information about the Riverfly Partnership can be found at www.riverflies.org

The Environment Agency should be contacted to see if any further investigation has been made regarding the historical low oxygen concentrations and elevated ammonia, and if so what the outcome has been.

Siltation

The brook has clearly had much of is natural bed removed as a result of decades of channel maintenance for land drainage purposes. The survey identified a number of reaches that were clearly over-deep relative to bed levels beneath bridges (such as the brick culvert downstream of Sainsbury's). To deliver effective and sustainable habitat restoration to these reaches bed raising is required (augmentation with a mix of gravel, cobbles and chalk). This would enable the bed to be reinstated back to the level it was prior to channel deepening. This approach would greatly increase depth variability on the brook, creating a restored channel that is better able to transfer sediment and would provide more ecologically diverse habitats.

The use of channel narrowing techniques can also be effective to address siltation. However, narrowing a channel that is already over-deep may not bring about the desired results as the channel depth may be too great to allow effective vertical scouring off the bed. Channel narrowing combined with bed raising is the technique most likely to deliver sustainable results.

An alternative to the use of pre-planted coir rolls would be to create brushwood margins. These features can be deployed where the channel exhibits sinuosity thereby using the features to speed up flows on the outside of meanders to encourage sediment transfer and deposition. If the sediment is not mobilised then a team of volunteers with buckets can be used to hand-lift silt from the bed and to place it on the newly created margin. The margin can then be planted with translocated plants or stock especially brought in for the brook. (However, a sustainable solution to silt management should be sought rather than depend upon volunteer effort).

Picture 30 – the slight meander could be enhanced further through the use of a brushwood ledge (shown by green line).

Picture 31 – the slight meander could be enhanced further through the use of a brushwood ledge (shown by green line).

Picture 32 – a brushwood ledge created to enhance a meander on the Hoffer Brook, similar structures could be used on the Cherry Hinton Brook.

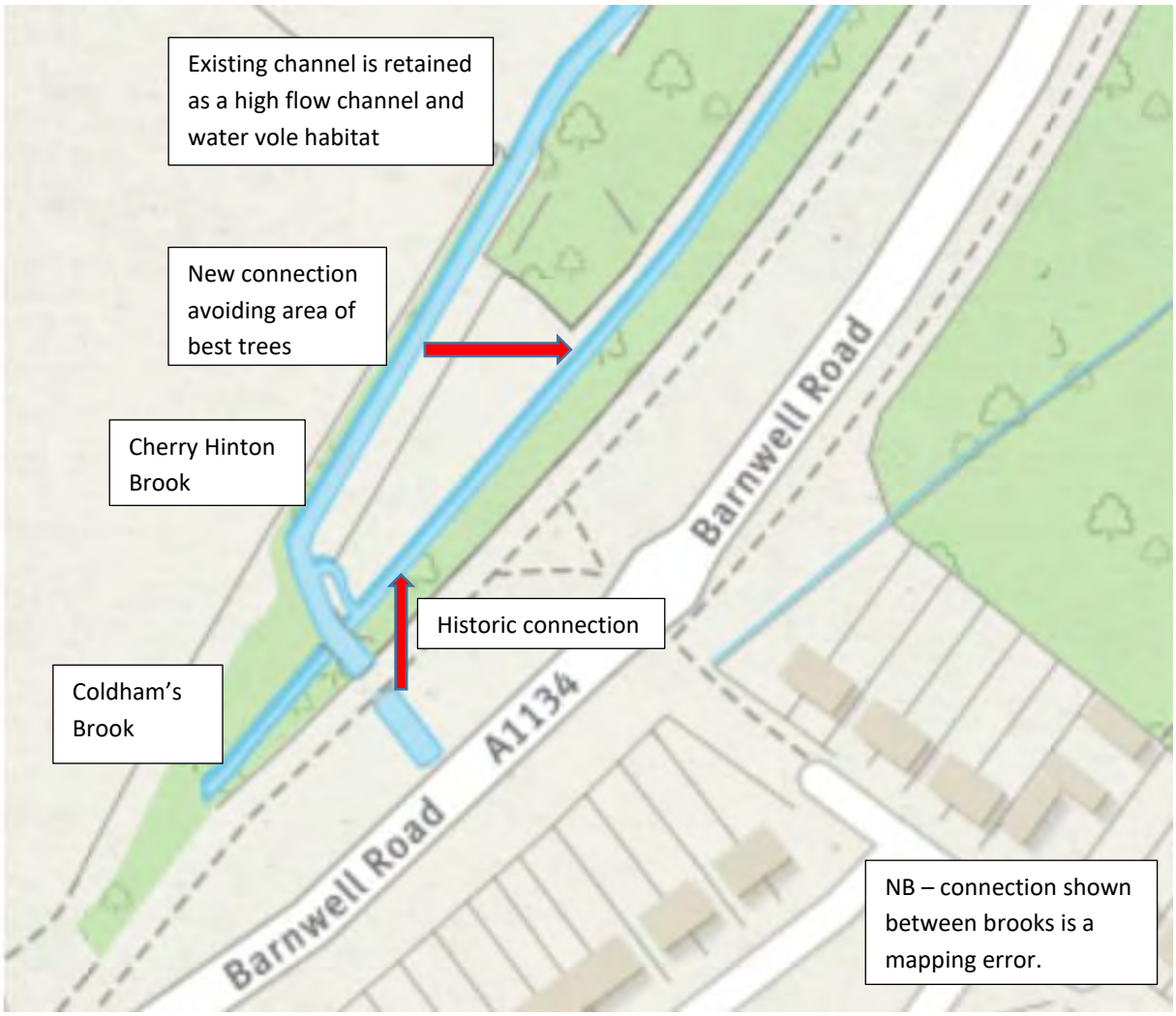
With regard to the continued use of pre-planted coir rolls, it would be advisable to observe their effectiveness and to decide if, and how, they could be used in the future. They are expensive and similar effects can often be achieved with locally sourced natural materials.

Lack of connectivity

One should consider how brown trout might enter the Cherry Hinton Brook. It is quite clear that they would have to enter the Coldham's Brook from the Cam (it is very likely that they are in the Cam as they are certainly in a number of smaller watercourses within the City). From the Coldham's Brook they could move upstream, but it is reported that there is only a pipe connection between the brooks. The pipe is extremely unlikely to draw fish to it given the very low flow of the lower Cherry Hinton Brook compared to that of the Coldham's Brook, and it is extremely doubtful that fish could swim up a pipe from the description given.

The logical step is to consider where a connection between the brooks could be made. It is proposed that, subject to legal permissions, flow

investigations and land ownership issues, a connection of the brooks within the Coldham's Common could be made. The connection within the Common could take the form of a naturalistic channel that would enable a wide range of fish species to move up it (similar in concept to the fish pass channels at Byron's Pool and Lammas Land, Cambridge, but in this case high energy scour protection would not be needed to the same extent).



Map 4 – general location of where a connection between the Cherry Hinton Brook and Coldham's Brook could be made.

It should be noted that during investigation of the Coldham's Brook near to its first crossing by the Cherry Hinton Brook there appeared to be a former connection. Two 600mm concrete pipes emerged at an angle to the brook,

which together with bed armouring, suggested that flow had a some point in the recent past been directed from the Cherry Hinton Brook down into Coldham's Brook. These pipes are now bricked-up. Enquiry should be made with the Council's drainage team to see if this historic connection is known.

Picture 33 – note the blocked outfall to the Coldham's Brook (red arrow) believed to have been from the Cherry Hinton Brook. The Cherry Hinton Brook now flows over the Coldham's Brook (blue arrow).

<u>The need for sensitive vegetation management</u>

In places, in-channel vegetation is very dense and it clearly needs some management. Vegetation management can be very effective in sustaining a mix of habitats within chalk rivers. The technique of repeated hand weed cutting along a watercourse by the same person(s) can have the effect of "training" the river's flow along a desired path. The author has used this technique to good effect on the nearby River Shep. The key to the success of this approach is the deployment of effort at the right time of year, and to maintain the same pathway for a number of years in order to enable more slowly colonising plants to become established (or to be introduced and grow). This "little and often" approach should be adopted so that the brook

is "trimmed" in mid-spring to establish an open pathway for flow, it is then trimmed again in early June when plant growth is quite rapid, and then cut in late summer (mid-August) to clear the dense summer growth ready for the increasing flow of the winter period. Whilst these management dates can be prescribed in writing, the actual timing of their deployment will depend on the brook's flow, light and temperature. The Friends would need to be fairly alert to the need for vegetation management to prevent it from totally overgrowing the channel, causing the brook to carve its own path (which would be likely to change every year resulting in very little stabilisation of marginal silt). If support is given by Cambridge City Council the author is willing to lead a small team (no more than four persons) on weed cutting. Any vegetation management will also need to have full regard to the presence and protection of species such as water voles and nesting birds.

5.0 Making it Happen

Further assistance from the Wild Trout Trust is available in the form of:

- Helping obtain the necessary consents for carrying out in-stream works, from either the local authority or Environment Agency (depending upon whether the brook is a designated Ordinary Watercourse or a Main River).
- A practical visit, which involves a visit from a WTT Conservation Officer to complete a demonstration plot on the site to be restored. This enables recipients to obtain on-the-ground training regarding the appropriate use of conservation techniques and materials, including Health & Safety, equipment. This will then give projects the strongest possible start leading to successful completion of aims and objectives. Recipients will be expected to cover travel expenses of the WTT attendees.
- Support for design and supervision of habitat feature placement, tree works and other necessary in-channel works.

The WTT website library has a wide range of free materials in video and PDF format on habitat management and improvement:

www.wildtrout.org/content/library

The Wild Trout Trust has also produced a 70-minute DVD called 'Rivers: Working for Wild Trout' which graphically illustrates the challenges of managing river habitat for wild trout, with examples of good and poor habitat and practical demonstrations of habitat improvement. Additional sections of film cover key topics in greater depth, such as woody debris, enhancing fish stocks and managing invasive species.

The DVD is available to buy for £10.00 from our website shop www.wildtrout.org/product/rivers-working-wild-trout-dvd-0 or by calling the WTT office on 02392 570985.

6.0 Acknowledgement

The WTT would like to thank the Environment Agency for supporting the advisory and practical visit programme in England, through a partnership funded using rod licence income.

7.0 Disclaimer