Alder Brook, Crowborough, East Sussex.

Advisory Visit April 2017

Key Findings

- **This section of the Alderbrook is typical of many of the High Weald ghylls.**
- **The stream is comparatively gravel-rich and provides some good spawning opportunities for wild brown trout and other gravel spawning fish species.**
- **The channel shape is diverse and is being maintained by considerable amounts of fallen woody material which should be left in situ.**
- **Successional tree planting to replace mature trees that are lost or under threat is recommended.**
- **The control of non-native plant species on river banks locations is recommended.**
- **It would appear that very little information about the ecological status of this particular headwater stream is available. Determining a benchmark for what species are currently present could help in its future management and protection.**
- **The stream could provide a superb educational resource due to its location, sandwiched between green open space and the large residential area of Crowborough.**

1.0 Introduction

This report is the output of a site visit to a 1.0km stretch of the Alderbrook, a High Weald ghyll and a tributary of the River Medway. The reach inspected ran from NGR TQ 52000 28868 down to TQ 52559 28564. The request for the visit came from John Deller, Estate Manager for Wealden District Council.

The council has recently purchased the stream and block of land through which it meanders and is managing it as a sustainable alternative natural greenspace (SANG) located on the southern urban fringe of Crowborough.

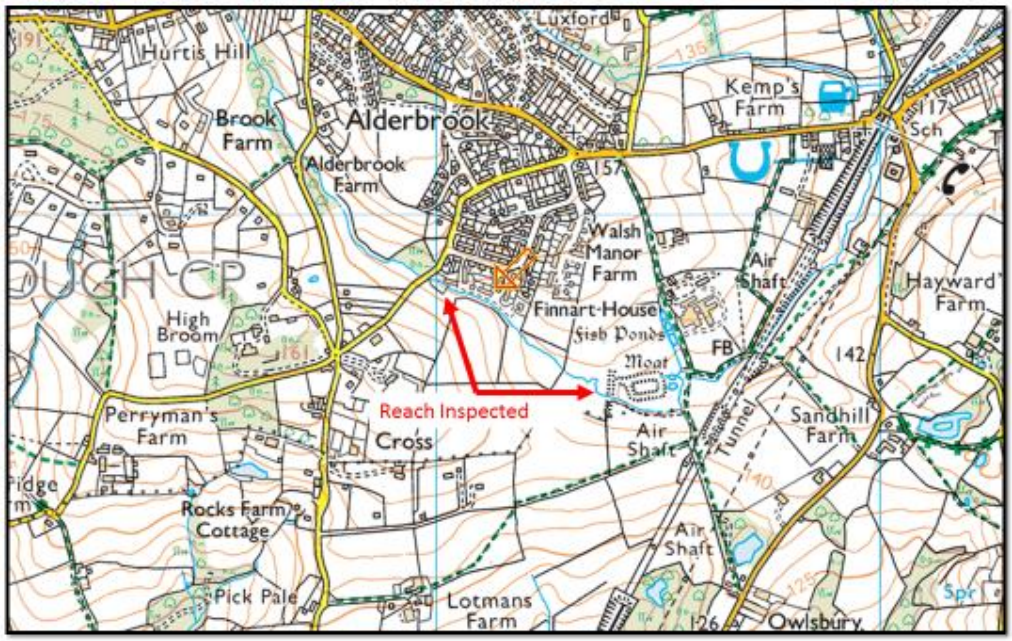
The Alderbrook itself is not classified under the Water Framework directive and is unlisted by the Environment Agency but appears to be a headwater of the Jarvis Brook Catchment (Waterbody ID no GB106040013360).

Comments in this report are based on observations taken on the day of the site visit (December 2016) and discussions on the day with Mr. Deller.

Normal convention is applied with respect to bank identification, i.e. left bank (LB) or right bank (RB) whilst looking downstream. Upstream and downstream references are often abbreviated to u/s and d/s, respectively, for convenience. The Ordnance Survey National Grid Reference system is used for identifying locations.

	Alder Brook
River	Alderbrook
Waterbody Name	Jarvis Brook
Waterbody ID	GB 1060400013360
Management Catchment	Medway
River Basin District	Thames
Current Ecological Quality	Good Status
U/S Grid Ref inspected	TQ 52000 28868
D/S Grid Ref inspected	TQ 52559 28564
Length of river inspected	1.0km

Table 1. Overview of the waterbody. Information sourced from http://environment.data.gov.uk/catchment-planning/WaterBody/GB1060400013360



Map1. Alderbrook south of Crowborough © streetmap

2. Catchment Overview

The River Medway rises from springs in the High Weald near Turners Hill in West Sussex and joins the Thames near Chatham in Kent, draining a catchment of approximately 2400km^2. The Medway is a heavily modified river and has been extensively altered for milling, navigation and flood defence purposes.

The plethora of small streams, locally known as ghylls, that drain the High Weald are hugely valuable and are in part responsible for helping to characterise the local landscape. The geology comprises of Hastings Beds, which are a nutrient poor mixture of clays and outcrops local sandstone and ironstone. The network of streams draining the central and northern half of the high Weald invariable flow north and east to join the Medway.

The ghylls, or High Weald streams are "flashy" by nature and are invariable set into steep sided, deeply incised clay banks. These streams can transform from benign trickles to powerful torrents following any heavy rainfall event. These ghylls are usually tree lined and heavily shaded, even when flowing through grazed pasture.

3. Habitat Assessment.

This section of the Alderbrook is typical of many small streams draining the High Weald area. The upper section of the reach inspected bisects an area of land which has been purchased by the Wealden Council and is being developed as green open space for the benefit of the whole community.

The upstream section of channel is flanked on its LB by an access road and represents the border between the green open space and the southern fringe of the Crowborough conurbation.

This particular upper section of the stream benefits from a relatively steep gradient and mainly takes the form of shallow riffle habitat, flowing over a gravel-rich bed. Outcrops of eroded sandstone and ironstone can be seen, as well as flint gravels. The river bed here also contains cobbles and brick fragments, which presumably were discarded during past local building projects. The stone-rich bottom, whether natural, or introduced, provides some potentially useful habitat for gravel spawning fish species such as brown trout *Salmo trutta*, bullhead *Cottus gobio* and brook lamprey *Lampetra planeri*. Unfortunately there is little information available regarding local fish communities but it is possible the stream also supports other gravel spawning species.

Broken riffle habitat also provides valuable habitat for specialised invertebrate communities and helps to maintain high dissolved oxygen concentrations, which can be particularly important in lowland streams that receive substantial quantities of urban run-off or waste water discharge.

Photo 1. Shallow riffle flowing over a mainly gravel bed at the top end of the reach

Efforts to plant up the margins were evident with some tree species having been planted on a low section of RB (photo 2). This low section of bank will be subject to inundation following a heavy rainfall event and the success of the planting will very much depend on which tree species have been selected. On a slumped bank or berm, which is potentially located in a relatively high flow energy

environment, only certain species will flourish, with willow *Salix spp* being the most-well adapted and resilient.

Photo 2 Recent tree planting on a section of slumped bank. Clumps of Pendulous sedge were also evident.

Alder, *Alnus glutinosa*, Ash, *Fraxinus excelsior* and elder *Sambucus nigra* are relatively common bank-top trees, as are the thorns but they rarely survive in the toe of the bank, where winter flood water often rips them out before they can become established.

Towards the upper boundary there were clumps of either rhododendron or cherry laurel present (Photo 3). Both of these species are considered to be undesirable river-side plants, due to their propensity for intense shading. The leaves from both of these plants also contain toxins and are highly acidic in nature. This combination of factors usually result in bare banks which are then vulnerable to erosion.

Photo 3. Laurel or Rhododendron result in intense channel shading and bare banks.

Further downstream the gradient begins to drop out and the stream becomes a little more typical of a High Weald ghyll, with a meandering planform and sequences of deep pools punctuated by short lengths of riffle and glide. These physical features are invariably formed by large fallen trees creating debris dams, which provide the stream with natural flow deflectors which then blow out erodible bed materials to create deep pool habitats. Resultant eroded bed and bank material is then naturally graded and sorted according to size and density.

Fallen woody material is a critical component of habitat in streams like this and should, whenever possible, be left in situ. Some monitoring of natural woody debris dams is recommended because in extreme cases the small undershot gaps that usually occur in debris dams can become blocked with fine material, resulting in a sealed, full channel-width weir or dam developing. In such cases it is not unusual for the upstream bed levels to rapidly rise as increasing amounts of bed material are trapped on the upstream side. Occasionally this might result in large steps forming in the river bed, which then block access for fish species wishing to migrate up and down the system. One such debris dam is depicted in photo 4. In this particular case the blocked channel isn't causing a problem as a new channel has formed under high flow conditions, potentially facilitating fish migration around this naturally formed impoundment. Where there is sensitive infrastructure present, such as bridges or footpaths, it is sometimes advisable to ease out small sections of the debris dam to help any undershot flow develop and reduce the risks of damaging infrastructure. If there is room for the channel to migrate either side of the debris dam then the best outcome is simply allow the river to carve out a new route.

Photo 4. Established debris dam completely blocking the channel forcing the water to cut a new course.

Photo 5. Iron rich ground water entering the stream, highlighting why this area was so important for medieval iron smelting.

Evidence of iron-rich ground water (Photo 5) was seen in this reach, which gives the stream a strong "tea" colouration. Although iron-rich streams are usually less productive than more alkaline streams, they are nonetheless natural and valuable, often supporting specialised invertebrate communities.

There were numerous examples of high quality stream habitats where either large woody material had helped to create pool habitat, or where coarse woody material had fallen, creating a primary source of food for grazing invertebrates and excellent cover for juvenile fish species. Photos 6 and 7 are typical examples of good quality habitat that should be retained in any management plan.

Photo 6. Coarse woody material in the channel providing food for bugs and cover for juvenile fish

Photo 7. A further example of a holly root system trapping coarse woody material and providing good quality cover.

Photo 8. A large section of brick wall is evidence of how much power this stream can generate under spate conditions.

Evidence of the streams power in spate conditions were also evident, with the remains of a brick wall, which appeared to form part of a bridge wing and which now has been moved by the stream.

4. Conclusions

The Alderbrook is typical of many of the High Weald ghylls and represents a comparatively rare and important habitat. The stream will almost certainly be supporting a population of indigenous native brown trout, which will be well adapted to this specialised stream environment.

Trout populations became established in many of these headwater streams and tributaries following migrations of sea trout following the last ice age and prior to the construction of on-line ponds, mills, dams and navigation channels which have subsequently fragmented wild fish populations. Obtaining some base-line data on the Alderbrook's indigenous fish and invertebrate communities would help inform future management and maintenance decisions. It is possible that the Environment Agency has some data on this stream. If not, fish and invertebrate surveys can be commissioned via Environmental Consultants and the WTT is able to identify a range of companies that could potentially tender for supplying this information.

Increasingly invertebrate surveys are being delivered by voluntary groups as part of a citizen science initiative. As the presence of certain aquatic invertebrates is strongly linked to water quality, community groups are using surveys to keep a watching brief on the quality of their local rivers and streams. Training and linking data to a national database is being coordinated by the Riverfly Partnership. For more information go to www.riverflies.org

Maintenance regimes for these small tributaries should be very light and concentrate on the removal of man-made rubbish. Naturally fallen woody material is extremely valuable and should only be removed if absolutely necessary to avoid damage to local infrastructure, or reduce the risk of local flooding immediately adjacent to any blockages. The role that fallen woody material plays in helping to protect property located further downstream is now well documented. Natural Flood Management (NFM) where headwater streams are deliberately seeded with woody material can help to flatten out peak flood events and also helps to store water for slow release during prolonged dry spells.

Tree management on these small streams is important, especially given the threats currently posed to native ash and alder trees through disease. Shading is vital in helping to moderate summer water temperatures and helps to ensure that dissolved oxygen concentrations remain high. Shafts of sunlight that reach the river bed are also valuable in helping to promote primary production. The solution is to aim for a dappled light and shade regime. Should there be any long gaps along the bank line where trees are absent, or in danger of failing, then it is recommended to consider successional tree planting. This is also a valuable technique in helping to defend a bank that could be in danger of excessive

erosion in the future. Currently the reach in question supports a good balance of light and shade.

5. Recommendations

- Take a relaxed attitude towards in-channel maintenance. The WTT can help with some simple training for volunteers interested in sensitive habitat management.

- Move but do not remove woody material that is deemed to be causing a local issue.

- If debris dams form and subsequently the upstream bed level rises to more than 300mm above the downstream bed level then consider light intervention to ease fish migration.

- Control and if possible eradicate non-native plants. Plants that throw heavy shade and produce toxic leaves such as laurel and rhododendron should be removed.

- Consider identifying some local "river champions" to help clear man made rubbish from the channel. Also consider training for suitable volunteers in Riverfly monitoring so that a watching brief can be kept on the streams water quality and any problems associated with pollution quickly identified and addressed.

- Consider commissioning some "benchmark" surveys to determine exactly which fish, plant and invertebrate species are locally present.

6. Making it Happen

The WTT can provide further assistance to help implement the above recommendations. This includes help in preparing a project proposal with more detailed information on design, costs and information required for obtaining consents to carry out the works. If required, a practical visit can be arranged to demonstrate habitat improvement techniques. Demand for these services is currently high but WTT is able to provide further advice and information as required. Further advice on fund-raising can be found at www.wildtrout.org/content/project-funding

We have 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.

> The WTT website library has a wide range of materials in video and PDF format on habitat management and improvement. www.wildtrout.org

7. Acknowledgement

The Wild Trout Trust would like to thank the Environment Agency for their continued support of the advisory visit service.

8. Disclaimer

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