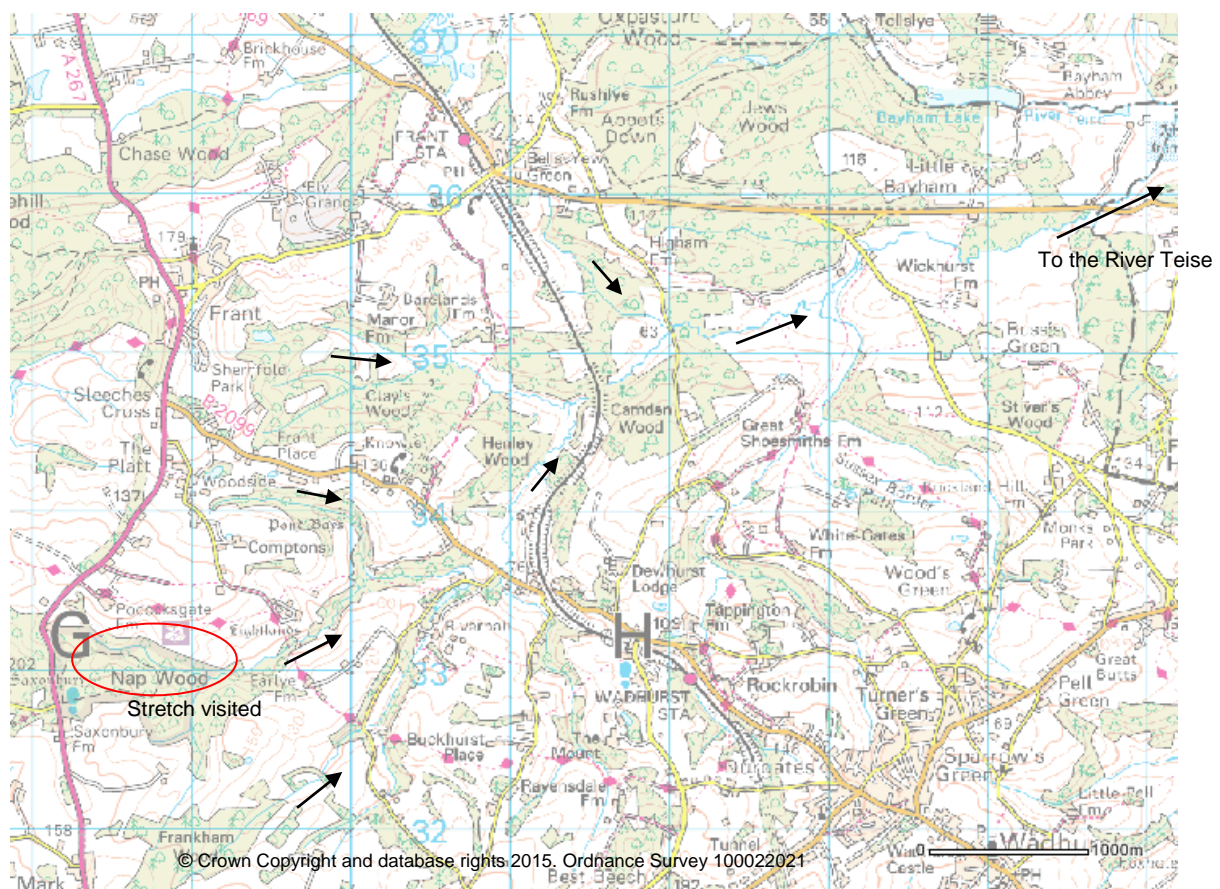


Specialist site visit – The headwaters of Bartley Mill Stream, Kent

Wednesday 3 June 2015

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The headwater streams of Bartley Mill stream (see map below) flow eastwards off the sandstones of the High Weald, through various broad-leaved woodlands: Nap Wood, Clay's Wood and Frankham Wood. They feed into Bartley Mill stream which in turn flows north eastwards into the River Teise, which then flows northwards into the River Medway.



The headwater streams of Bartley Mill Stream.

We walked from the A267 at TQ 582 330 through Nap Wood, down one of the headwater streams feeding the Bartley Mill Stream. We covered the first 500 metres of the stream before turning back. We drove round to bridges over the main Bartley Mill Stream stream, on the B2099 at TQ 609 336 and at Sewers Bridge TQ 620 352.

At the top of the wood there is extensive flush habitat creating a highly natural mire/stream transition (Figure 1), with extensive *Sphagnum* beds and fallen wood adding habitat complexity.



Figure 1. The mire/stream transition at the top of Nap Wood.

The stream channel becomes more defined downstream, with abundant woody debris and a sinuous planform (Figure 2).



Figure 2. The stream channel immediately downstream of the headwater mire.

As the stream channel increases in size downstream, more bed incision is noticeable, with the steep banks being colonised by mosses and liverworts. Bed

substrates increase in size to include exposed cobbles and boulders covered in mosses (Figure 3). Debris dams start to create a stepped longitudinal profile with small scour pools downstream, generating a complex habitat mosaic (Figure 4).



Figure 3. Steep bryophyte-covered banks.



Figure 4. Debris dam formation.

Ephemeral side-channels enter the main stream at intervals, with abundant woody debris and coarse substrates providing additional habitat variation (Figure 5).



Figure 5. Ephemeral side-channel.

The woodland canopy and incised nature of the ghyll generates ideal conditions for bankside ferns.



Figure 6. Classic High Weald ghyll habitat.

An *ad hoc* composite sample of aquatic macroinvertebrates was taken as we walked down the stream. The assemblage reflected the diverse habitat mosaic present. Freshwater shrimps (*Gammarus pulex*) benefit from the fast water, coarse

substrates and leaf litter (which they shred). The predatory stonefly *Isoperla grammatica* also uses the gravel substrates with fast water, whilst the caseless caddis-fly *Plectrocnemia* spp (probably *P. conspersa*) exploits the calmer stream pools where it spins its nets. Burrowing mayflies (Ephemeroidea) use the finer substrates of quieter water, whilst water-crickets (Veliidae) live on the water surface in slack-water areas.

Down the course of the stream riparian flushes are evident, dominated by *Sphagnum*.



Figure 7. Riparian flush dominated by *Sphagnum*.

Downstream of Nap Wood, the headwaters meet and the main Bartley Mill stream runs through a mixture of pastureland and woodland. It maintains good physical habitat quality at least in the reaches down to Sewer's Bridge (Figure 8).



Figure 8. Bartley Mill Stream at Sewers Bridge.

Key messages

Nap Wood is an excellent example of a highly natural headwater mire/stream complex, providing habitats characteristic of the High Weald landscape. Although the rest of the headwater stream system of Bartley Mill Stream was not visited on this occasion, most of it runs through long-standing broad-leaved woodland and it is expected that the rest of the stream network is equally natural.

1. Objectives

Natural ecosystem function should be the principal objective for the site. This concept is embedded in [Common Standards Guidance for river habitat](#) and in guidance on priority river habitat (Mainstone *et al.* in press).

2. Priority habitat mapping

This headwater stream system has been included in the refined map of priority river habitat (Mainstone *et al.* 2015).

3. Management issues

Trees and woody debris - The importance of the interaction between standing and fallen wood and mire and stream habitat is clear here at this site as it is elsewhere in the headwater stream systems visited in Sussex and Kent. Fallen trees across mire and stream habitat should be left in place to generate characteristic habitat mosaics

and provide dynamism in the stream/mire system. Debris dams should be allowed to develop and decay naturally.

4. High Weald streams as a network

The headwater streams of the High Weald, including their associated spring and flush habitat, constitute a highly important habitat resource. There are many fine naturally functioning examples of stream habitat, most of which are still connected to intact flush and spring habitat. Their association with ancient woodland, and rare species such as mosses, adds to the biodiversity importance of the landscape. Whilst these streams have high conservation value in their own right, they are also critical to the health of downstream river systems, and when functioning naturally they provide a range of ecosystem services that are too often taken for granted. These services include nutrient processing, water cooling (in association with woodland or riparian trees) and flow regulation, the latter in relation to moderating peak flows and supporting base flows in dry weather.

Damaged streams and stream sections can and should be restored to higher levels of natural habitat function, with all of the biodiversity and societal benefits that brings. Headwater streams are too easily forgotten by the decision-making processes that govern water management (including the Water Framework Directive) and so greater reliance needs to be placed on biodiversity drivers (protected sites and priority habitat) to make sure they receive the attention they deserve (Mainstone et al. in press).

The Bartley Mill headwater stream system should be seen as part of a series of headwater systems of high conservation value running off the High Weald that should be conserved in an integrated way based on naturally ecosystem functioning. These streams (both natural and impacted ones) should be treated as a network, and a set of common key messages should be provided to landowners to promote their management as naturally functioning headwater stream systems. Key messages to include:

- Maintain or restore continuity of natural water-related habitat from valley mires, through springs to stream channels.
- Minimise physical interventions to the channel and its margins.
- Maintain tree cover (and increase to patchy cover where needed) and retain fallen trees and woody debris unless there is a significant safety risk – woody material is an essential element of natural stream/mire function.
- Be aware of water resource and water quality pressures in the catchment and raise awareness of the need to control these pressures to protect natural ecosystem function.

In addition, a local initiative to find or develop definitive names for all of the streams in the High Weald would be a positive step for headwater stream conservation. The lack of names (or at least well-known names) seems symptomatic of a lack of societal value assigned to headwater streams. A naming initiative would help focus greater attention on them and their conservation importance, encourage greater care over activities affecting them, and foster public engagement.

Potential SSSI notifications for stream habitat, including associated flushes and springs, constitute one facet of a wider perspective on SSSI notifications in this landscape, which includes terrestrial habitats (particularly ancient broadleaved woodland) and rare species such as bryophytes. An integrated approach to notifications is necessary to ensure that the links between these features, and the dependency of characteristic species on natural ecosystem function, is properly captured. This needs to be supported by appropriate use of priority habitat mapping, to ensure that valuable sites not selected for SSSI notification receive the recognition (and the drive for restoration where necessary) that they deserve.

References and further reading

Mainstone, C.P., Laize, C., Webb, G. and Skinner, A. (2014) [Priority river habitat in England – mapping and targeting measures](#). Natural England joint publication JP006.

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09/02/16