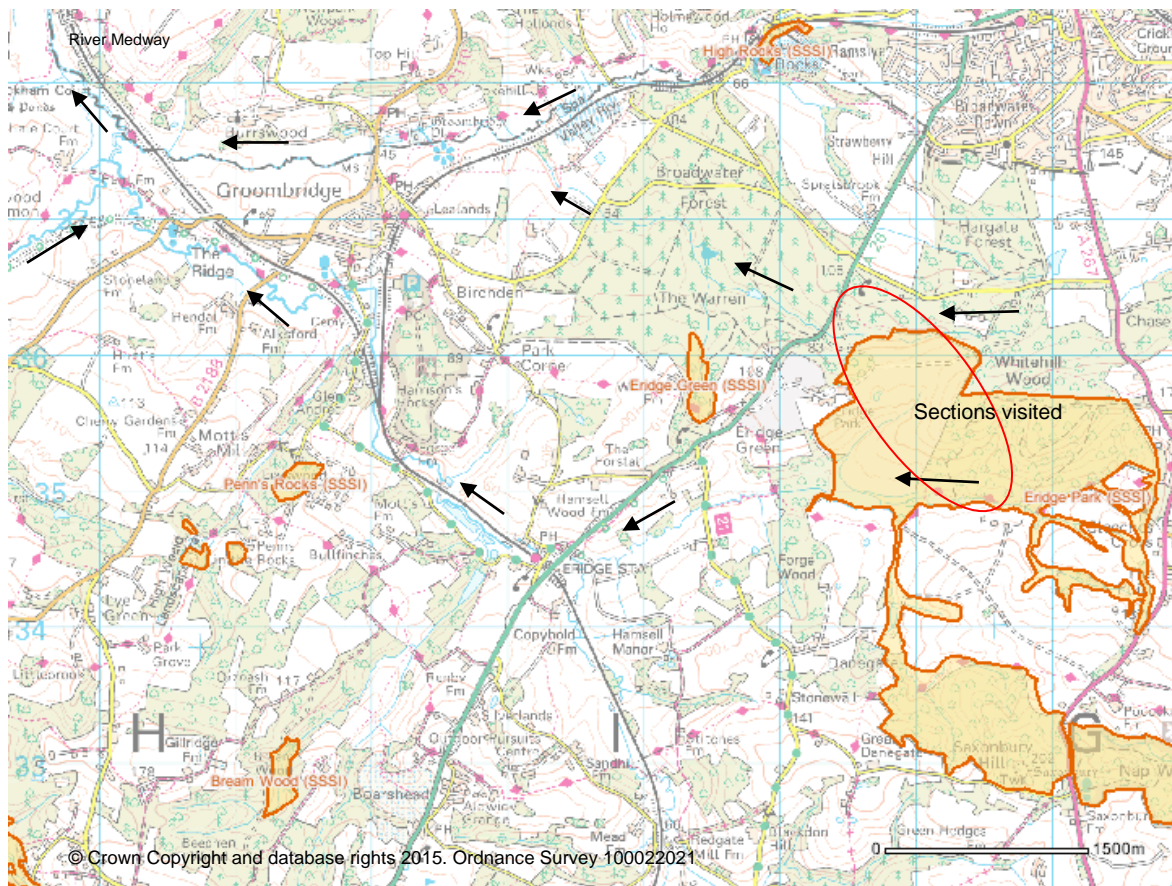


Specialist site visit – The streams of Eridge Park SSSI and Broadwater Warren, Kent

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In attendance: Chris Mainstone, Jane Robertson, Fran Southgate, Louise Bardsley

These streams form part of the headwater network feeding the River Medway to the north, along with the adjacent north-flowing streams from Ashdown Forest. They are influenced by both sandstone and clay geologies, giving rise to a mixture of base-poor and base-rich conditions.



The headwater streams of the area.

We walked from the entrance to the Eridge Park SSSI at NGR TQ 555 355, down the headwater stream running through the SSSI and then onto the Broadwater Warren RSPB reserve. We briefly looked at the main stream running through the RSPB reserve, just upstream of the Decoy Pond at TQ 559 364. We also briefly inspected the stream as it leaves the reserve under the Tunbridge Wells-to-Groombridge Road at TQ 547 371.

The mire/stream transition at the top of the headwater stream is highly natural, under a canopy of alder with extensive fallen wood interacting with mire and stream (Figures 1 and 2). A good example of alder carr within a natural valley mire/stream system.



Figure 1. Flushes at the top of the stream running down from Eridge Rocks.

Mire vegetation is well-developed under the patchy tree canopy. Extensive *Sphagnum* but also areas with unusual assemblages (Figure 2) including extensive common skullcap (*Scutellaria galericulata*) and spearwort (quite robust but seemingly *R. flammula*).



Figure 2. Wetland assemblage of extensive *Scutellaria* with spearwort.

The stream channel varied in cross-sectional profile, from a shallow bed (Figure 3) to moderately incised (Figure 4). The variation in bankside conditions provides niches for a range of flora, with bryophytes dominating the stable steeper banks. The stream bed contained a mixture of unconsolidated substrates from gravel to silt. Some of the moderately incised channel towards the downstream end of the stream seemed very straight and may have been a consequence of past drainage attempts.

Unfortunately one small patch (about 0.5 m²) of *Crassula* was found in the stream channel a couple of hundred metres from Eridge Rocks. This appeared to be an isolated patch so with a rapid response could be nipped in the bud. There is no obvious source but given the extensive deer tracks and acidic conditions it could quickly spread through the site if not dealt with quickly.



Figure 3. Shallow cross-section with riffle habitat associated with riparian alder.



Figure 4. Moderately incised channel with bryophytes and ferns.

The main stream running through Broadwater Warren immediately upstream of the decoy pond is significantly larger and of lower stream gradient. The channel is quite sinuous, encouraged by the development of woody debris dams (e.g. Figure 5). In some places the influence of trees and fallen wood has helped to generate multiple

channels, creating additional natural habitat complexity and increased stream habitat extent (e.g. Figure 6).



Figure 5. Woody debris creating channel movement and increased habitat complexity.



Figure 6. Multiple channels on the main stream through Broadwater upstream of the Decoy Pond.

A sinuous channel planform is critical in generating variation in water depth, substrate size and bank profiles (Figure 7), all of which are vital to the provision of habitat niches for the full range of characteristic biota.



Figure 7. Lateral movement of the stream channel creating a shallow bank profile on the inside of the meander (note the secondary channel forming on the right).

At the downstream end of the RSPB reserve there is excellent alder carr adjacent to the main stream (Figure 8).



Figure 8. Alder carr at the downstream end of Broadwater Warren.

An *ad hoc* composite sample of aquatic macroinvertebrates was taken as we walked down the stream. The assemblage found reflects the diverse habitat mosaic present. Freshwater shrimps (*Gammarus pulex*) are abundant as well as the stonefly *Nemoura cinerea* – both are shredders taking advantage of the plentiful leaf litter in the stream, the former preferring swift-flowing water with coarse substrates and the latter preferring slow-flowing water with fine organic sediments. Pea mussels (*Pisidium* sp.) are also a prominent feature of the assemblage, burying themselves in the finer substrates. Tipulid (crane-fly) larvae favour the damp flushes and vegetated margins of the stream. The gelatinous red alga *Batrachospermum* is present, which prefers cool, low-nutrient streams close to their source.

Unfortunately we had insufficient time to properly explore the streams of Broadwater Warren. The site generally had a more open feel than the parts of the Eridge/Broadwater area that we had managed to see. The combination of open and wooded areas is important in generating a full expression of characteristic stream flora and fauna. Whilst the wooded streams have a characteristic lack of higher submerged and marginal plants (being naturally dominated by leaf litter and lower plants), the open sections of stream provide better conditions for characteristic higher plant assemblages and their associated fauna.

Key messages

1. *Crassula*

Find the patch as soon as possible and remove entirely, leaving no fragments to recolonize. Consult freshwater non-native species specialists Gavin Measures if necessary.

2. *Decoy Pond and other artificial on-line impoundments*

These are not desirable in the context of naturally functioning stream ecosystems so their removal or by-passing should be considered. More characteristic standing or slow-water habitats can be generated through natural stream and related hydrological processes over time. For instance, pools within mire habitat and backwaters created by lateral movement of the stream channels. This site is of a size and discreteness that lends itself to such an approach, and is under conservation management.

3. *Woodland management*

The semi-natural woodland areas of the site are critical to the natural function and therefore the condition of the headwater stream system, providing a plentiful supply of woody debris and leaf litter to sustain stream habitat and characteristic biota. These areas are best managed as little as possible, leaving fallen trees across stream channels and upstream mires and allowing woody debris to form dams in the stream channels.

4. *Priority habitat mapping*

Despite the existing impacts of on-line impoundment, the stream system of the Broadwater/Eridge area is suitable for inclusion on the 2014 priority river habitat map of England, which is now subject to on-going local refinement. Some consideration should be given to the level of groundwater hydrological (water resource) pressure on the stream system – unless this is severe this is not a reason for excluding the streams from the priority habitat map.

5. *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 Eridge Park and Broadwater Warren streams 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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