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Report on Advisory Visit to Semington Brook, June 2004

Summary

1. Nick Giles walked the Woodbridge Mill Farm water, Semington Brook on June 24th in the good company of Mrs Judith Sharp. The Brook has an abundance of natural cover, a low-level stock of wild trout, bullheads, water crowfoot (Ranunculus), Starwort (Callitriche) and other submerged and marginal aquatic plants. Mink are controlled on the farm and it would appear to be an excellent potential habitat for water voles. Whether water voles are currently present is not known.
2. The fishery runs through extensive farmland with former water meadow systems and the low-intensity nature of the agriculture close to much of the upper Brook means that the banks and water quality are generally in good order. It was noted that one field of fodder maize upstream of the Mill may be a source of fertilisers and, perhaps, sediment inputs. The outflow from the Sewage Treatment Works (STW) appears to be of acceptable quality – invertebrates found just downstream were fairly diverse and abundant. It is clear that some nutrient enrichment is going on as there is abundant filamentous green algal growth over much of the bed (up- and downstream of the STW).
3. The principal factors affecting wild trout habitat quality were assessed as:

- Siltation of spawning gravels and of the general bed of the Brook.
- Over-shading of the channel by trees or reeds, depending on location.
- Possible difficulty for trout reaching good spawning habitat because of the positioning and design of the various sluices.

4. Most of the Brook upstream of the Mill is tunneled by tree growth or, in the open sections, densely over-grown with marginal reeds and grasses. The lack of light reaching the river and stream beds has a number of important knock-on effects:

- Bank side grasses are shaded-out, producing erosion of banks which are no longer bound by grass roots.
- Silt washed in from the banks is added to by large amounts of dead leaves falling from the trees each autumn – this leads to silting of the channels.
- Aquatic plants including marginal rushes and reeds, in-stream weed beds and algae coating stone surfaces are all suppressed.
- This leads directly to little food for aquatic invertebrates and diminished insect and other invertebrate populations.
- Few invertebrates mean that there is little food for wild brown trout and poor quality fly fishing (few flies and few trout!).

What is required to reverse this situation is a strategic tree-pruning plan, implemented as funds permit. First, the tree boughs keeping light out of key areas of river channel must be identified and marked clearly, then they should be cut, ideally after the sap has dropped in autumn. All of the above works can be carried-out without any official permissions, provided that there are no Tree Preservation Orders (TPOs) currently in operation (the Local Council can advise) and, of course, that the relevant land owners (Railway) agree.

There is an abundance of natural cover and this area is of good ecological quality. A reduction in tree shading would promote reed growth and increase potential water vole habitats. The Brook could provide an excellent water vole conservation site, provided that mink presence is monitored and any new colonists are trapped and humanely killed. Otters would, potentially, colonise this area. An inexpensive method of monitoring mink and water vole presence is supplied with this report (Dr Jonathan Reynolds, Game Conservancy Trust).

5. The apportionment of flows between the main river channel and the side carrier is regulated by the Mill sluice. The impoundment caused by the Mill has caused a large body of silt to deposit in the upstream section of the Brook. If this is dredged-out, as used to be the case in River Board and NRA days, new sediments will simply fill it back in over time. The cost of de-silting by The Environment Agency probably now outweighs perceived benefits and so the programme has ceased. The following approach is suggested for future management:

- Minimise sediment inputs from upstream (buffer zone arable fields).
- Keep hand-pulling or spraying with Roundup, (with Environment Agency consent) the reed which invades the channel to prevent it from establishing mid-channel islands which will impede flood flows and will eventually split up the channel.
- Try using some temporary current deflectors, such as staked hazel hurdles, set at angles to the flow to flush silt through under relatively high flows. In this way, it may be possible to deepen the central channel, using the river flow to flush some silt away. In channel works of this type require prior Environment Agency consent.

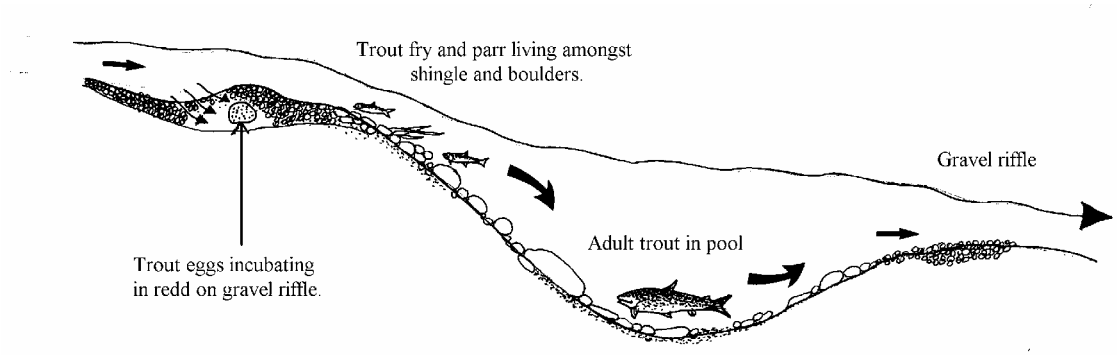
- In the Mill stream downstream, the channel close to the House is relatively slow-flowing and is currently dominated by filamentous green algae (blanket weed). The balance of plant growth here could be tilted in favour of starwort and, perhaps, Ranunculus, by quickening the current speed. This could be done, to some extent, by removal of vegetation blocking the stream below.

6. The bed of the Brook and carriers is extensively silted and compacted with sand and silt. Some of these sediments are produced within the fishery (bank erosion, tree leaves) and some comes in from upstream, perhaps originating from ploughed farm land further up the valley. The combined effect of this siltation is to produce very poor quality trout spawning habitat, a serious production bottleneck for the wild trout stock. This can be directly ameliorated by gravel cleaning (with specialized high-pressure water-jetting kit), directed precisely at where the wild trout stock is likely to spawn. Cleaned areas of gravel will improve the waters for fly fishing and generate many more wild trout. Cleaned river beds also rapidly develop more abundant invertebrate populations. Gravel-cleaning, if carried out well, is a very cost-effective exercise on trout rivers. However, on the small Semington Brook, a manual approach, using a fork to dig over gravels thoroughly may be sufficient to make a significant difference to trout spawning success.
7. I suggest the following priorities for water voles: 1/. Mink trapping, 2/. Sky-lighting stream through programme of tree management. And for wild trout: 1/. Gravel cleaning, 2/. Sky lighting channel. The de-silting of the mill pool is really to increase its visual appeal, rather than ecological value but this still means that it is worth doing!

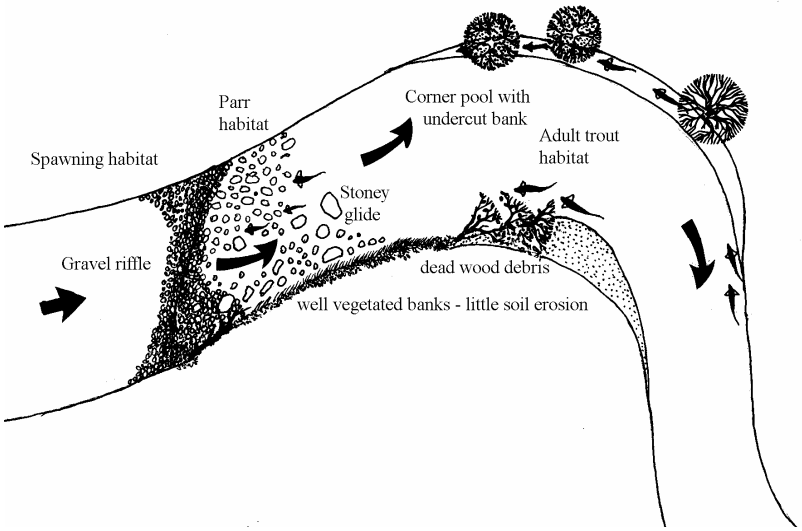
Background notes © Dr Nick Giles.

Wild trout habitat

Brown trout need good, clean water flows, relatively silt-free gravel for spawning, abundant cover from predators and a nice varied sequence of shallow riffles, weedy glides and deeper pools. The diagrams below show how a short section of good habitat can provide everything a wild trout needs throughout its life cycle:



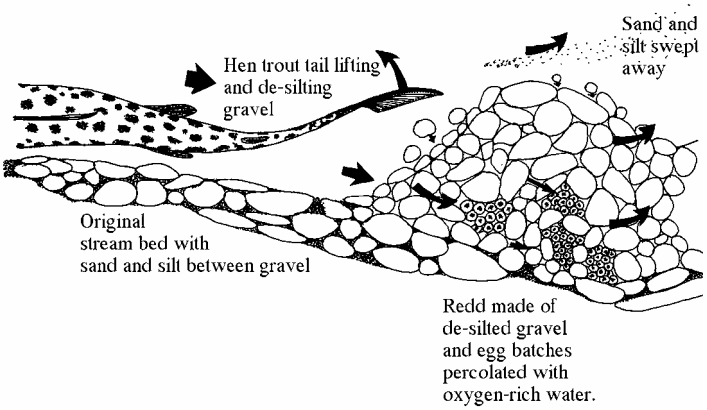
Trout stream riffle-glide-pool habitat sequence



Siltation of spawning gravels

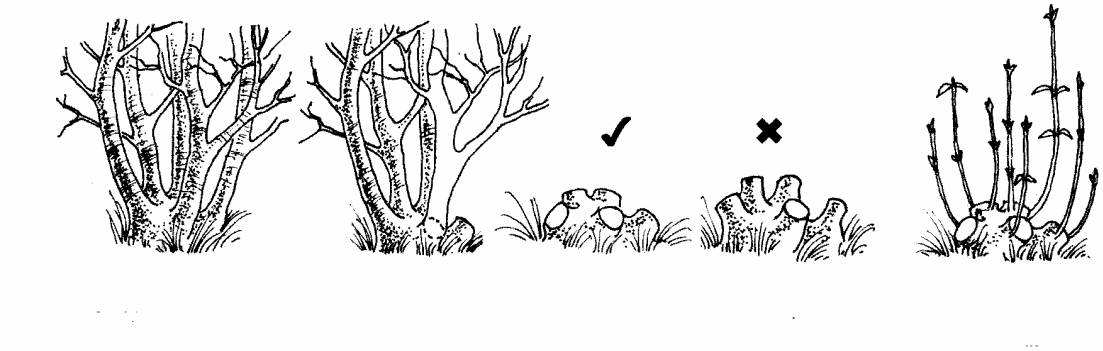
The wild trout stock is certainly being adversely affected by a river bed which is extremely silty and compacted, providing a poor environment for incubating fish eggs. This can be helped by a thorough water-jetting of suitable areas of gravel early each autumn, before the trout spawn in early winter. These cleaned areas will also be of value to bullheads and lampreys which spawn in the spring. Fly life will also be boosted by the opening-up of the formerly clogged river bed which will be re-colonised by a wide range of aquatic invertebrates. Larger flints uncovered during the water-jetting will be used by bullheads for breeding and cover and by trout fry and parr for cover. Sediments disturbed during the jetting process will re-deposit downstream in areas such as inner bends where they will produce habitats for various burrowing invertebrates (eg *Ephemera* mayfly nymphs) and for lamprey larvae.

Trout redd



Over-shading

Good coppicing practice:



Old growth Correct coppice Spurs too long Useful re-growth

Nick Giles June 25th 2004.