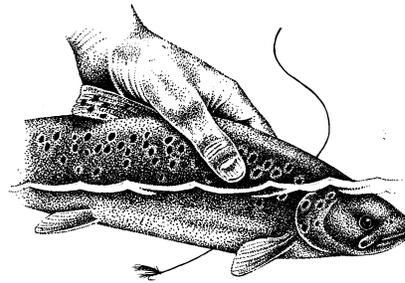


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Wellow Brook

Recommendations for habitat improvement



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Introduction

On October 7th 2002 Nick Giles carried out an advisory visit to the Wellow Brook, Somerset in order to provide outline habitat improvement advice. The stretch of stream is around 3 miles long close to Stony Littleton, south of Bath. Members of the Wellow brook fly fishing syndicate kindly came along during the river walk, adding greatly to the enjoyment and usefulness of the visit.

The stream is a typical clay-banked, limestone-fed stream, draining an area of extensive grazing land. Invertebrate surveys indicate good water quality. Where the stream is sky-lit, water crowfoot beds grow well. Winter spates are lively and the brook, which sits around 2 metres down in its summer channel often runs bank-high at times of flood. During spates the brook has developed a fine series of gravel riffles and corner pools. There is quite extensive physical cover for fish in the form of boulders, undercuts, alder roots and dead wood. Physical habitat quality, excepting the gravel bed, is in good condition.

The banks are in good condition with very little livestock trampling or excessive erosion. Mature alders line most of the fishery and these over-shade much of the water, leading to lower productivity of aquatic plants, invertebrates and wild trout than would be the case if some key trees were pruned. The fish populations are comprised largely of wild brown trout, some stocking of hatchery-bred trout has been undertaken in response to poor recruitment of the wild stock.

Stocking -pros & cons

Pros

- Produces 'instant' fishing.
- Allows as many fish to be killed as required.
- Is easy to organise.
- Can provide much larger fish and many more of them than the stream would normally sustain.
- Stocked trout do not have the need for high quality habitats that wild trout do.

Cons

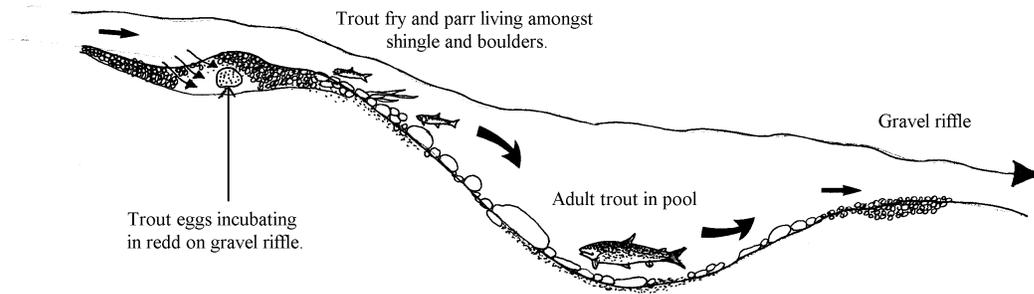
- Stock fish are expensive and many wander off out of the fishery (mostly downstream).
- Hatchery-bred trout upset wild fish, compete for available habitat, are predatory on young wild trout and represent a threat through inter-breeding to locally-adapted trout stocks.
- Relatively high densities of stocked trout attract predators such as herons and cormorants.
- Habitat management for all wildlife can be ignored if the link between the fishery and self-sustaining fish stocks is broken.

Conclusions:

- It is better to manage for wild trout than to go down the stocking road provided that adequate catches can be sustained by the stock.
- If stocking is contemplated, it is best to stock small numbers of sterile (triploid) adult brown trout which cannot interbreed with wild fish.

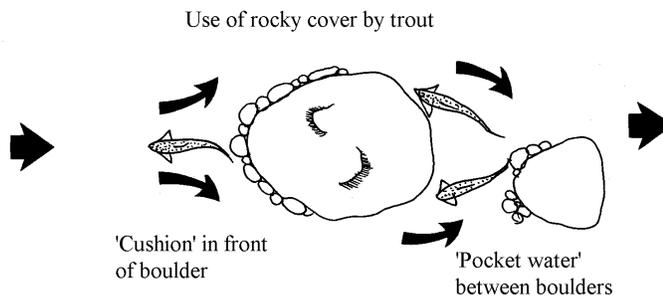
Wild trout habitat

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



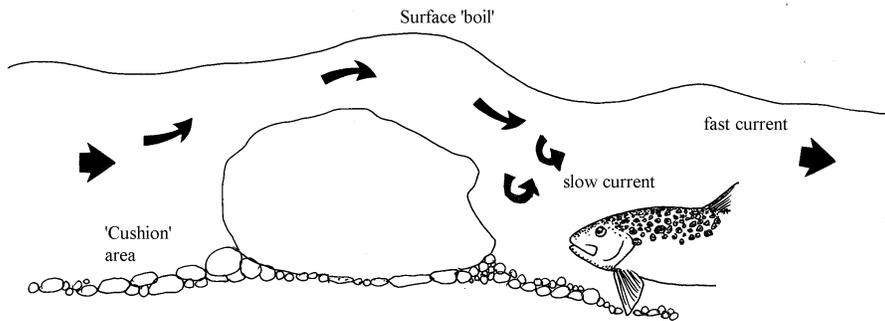
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The gradient of the river bed in the above diagram is greatly exaggerated - riffles and pools tend to be spaced fairly regularly down a fishery and there may be a pool every 6-10 stream widths on streams with fairly easily-eroded banks. Trout use all available cover to reduce energy expenditure fighting the force of the current and to avoid predators. Cover can be provided by boulders, by deadwood in the margins or by undercut banks bound by tree roots (especially alder and willow).



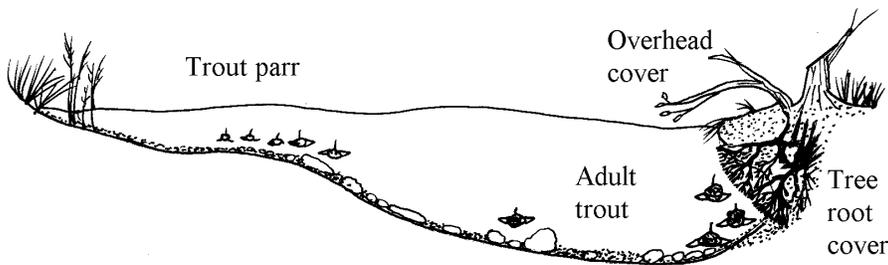
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Trout use of 'dead spot' behind boulder



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Trout use of a well covered pool



© Nick Giles

A good pool for trout provides adequate depth, cover, current speeds and food supply (insects from upstream riffles, bankside vegetation, etc).

The Wellow brook has all of the above key components of good wild trout habitat but there are some areas where further management could greatly improve the fishery. These are discussed briefly below:

Key findings from river walk

1/. Shading

Whilst this stretch of the Wellow brook needs adequate shading of the pools, extensive and carefully-targeted trimming back of tree boughs and trunks is recommended to produce a varied mosaic of light and shade along the fishery. This is good for fish, wildlife and for fishing. Concentrating on the south bank alders which currently shade-out riffles and glades should be coppiced in winter over the next few years. An eye should be kept open for fungal alder disease which may be present and could spread along the river.

Notes: Shading & tree cover

Over-shading of a river has the following adverse effects :

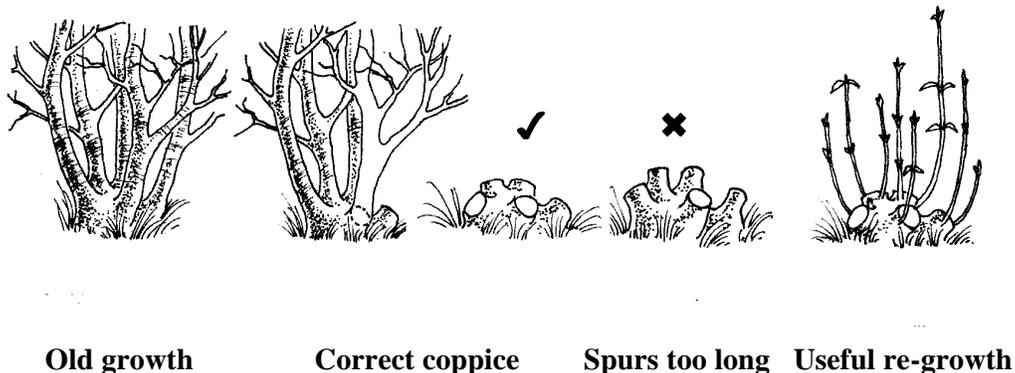
- Killing of bank side grasses, sedges, rushes and reeds which bind the banks with their roots. This can lead to bank erosion under the trees and to an over-wide, shallow, silty river channel.
- Reduced in-stream aquatic plant growth, providing poor summer cover for fish.
- Reduced production of aquatic invertebrates including insects essential for feeding wild trout, bullheads, stone loach, other fish and birds.

Cutting back carefully-selected trees in winter stimulates plant growth both on the banks and in-stream. This will have the following benefits :

- Better resistance to bank erosion and better bank side habitats for mammals, birds, insects and marginal cover for fish.
- Better marginal grass and rush growth and better moss and algal growth.
- More aquatic invertebrates including better fly hatches.
- A natural re-narrowing of the channel as marginal vegetation grows back along the edges of the channel. This optimises the use of available flows.

Some of the timber produced during the tree management work could be used to improve marginal cover for trout and for bank protection.

Good coppicing practice:

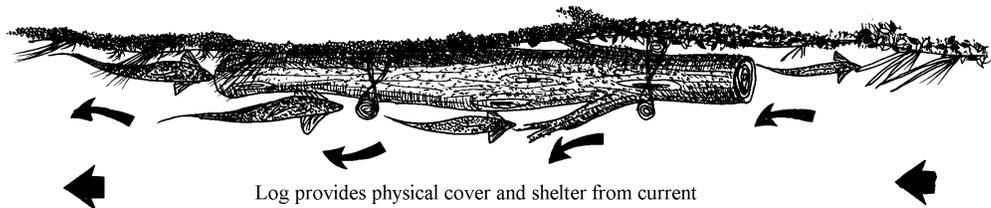


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In winter, when the sap has dropped and trees have stored most of the mobile energy reserves in the lower trunk and root systems, the following species should tolerate coppicing: Ash, Hazel, Alder, Goat willows (Sallows). Coppicing lets light into the stream, prolongs the life of the tree, maintains bank protection through strong root growth and provides raw timber materials for habitat improvement projects.

Where cover is sparse, logs can be securely pinned along the edge of pools to provide year-round protection.

Trout using dead wood cover feature - staked close to well vegetated bank.



© Nick Giles

Notes: Building in-stream structures

1. Environment Agency permission is required for in-stream works prior to construction.
2. After consent is gained you should follow the 'Dial before you dig' principle, ie. Obtain from the Environment Agency the numbers of all utilities companies (water, gas, electricity, sewerage, telecommunications, etc) which may have cables, pipes, mains or any other infrastructure which could be damaged by excavation of the river bed or driving stakes into the bed.
3. The Wellow brook is a high-energy system whilst in spate. This means that everything built in-stream must be staked down very securely and re-visited annually to check its security.

2. Spawning habitat

The bed of the Wellow brook is very silty and gravel riffles are bunged-up with silt.

Gravel-jetting.

Wild trout must have relatively clean gravels to spawn in - their eggs need a clean water supply whilst buried deep in the gravel over-winter. Ideally, excess sediments should be kept out of streams but, in the real world, this seldom happens. Spawning gravels (usually found in a bar diagonally across the stream at the tails of pools - a 'riffle') can be de-silted by high-pressure water-jetting. A small, portable petrol-driven water pump can readily be rigged up with a hose ending in a tubular metal probe which has been hammered flat to produce a high pressure jet. This probe should be inserted in the gravel at the head of the riffle and worked thoroughly through the gravel working across and downstream to create a de-silted area. Stop before you reach the crest of the riffle. This should be done in early October before trout look for spawning habitats.

It is important to do such work in areas where trout naturally spawn. This may be well-upstream on the Wellow brook system so the following recommendations are important:

- Look for trout redds in winter to target where future work should be done.
- Beg, borrow (Environment Agency?), make or hire (Nick Giles Associates) a water-jetter and try it out on some limited areas during the autumn.
- A two-man team on a stream the size of the Wellow brook should be able to clean four riffles in a full day's work.

New riffles

The Environment Agency has recently built three new spawning riffles for trout. This project is much appreciated and welcome. It is recommended, building on the Agency work, that further (rather smaller diameter) gravel is added just upstream of these new riffles to produce a well-aerated stream bed which can readily be used for spawning by the wild brown trout typical of the Wellow Brook.

There is also scope for adding gravel to existing riffles, using the existing bed to hold the gravel in place.

3. Bank erosion

Himalayan balsam

Himalayan balsam (*Impatiens glandulifera*) is an exotic plant species which is currently colonising many of our river systems. This Asiatic balsam, introduced to Britain over 150 years ago as a greenhouse plant, has an annual life cycle, is extremely competitive and spreads rapidly along river banks, shading out native flowering plants, grasses, reeds, rushes and sedges. Typically the plant grows to 6 feet or more, flowers, sets seed and then dies. The specialised 'exploding' seed heads, which give the plant one of its common names 'touch me not', distribute hundreds of seeds over a wide area. Seeds are also commonly swept downstream, starting new stands where they wash up. Balsam stands are dense and require early action if any degree of successful control is to be established. At the first signs of colonisation, plants should be pulled up or strimmed at the base before any flowering takes place. Spraying should be considered to stop this plant getting out of hand. Balsam soon over-grows and shades out these plants, leaving relatively bare banks over winter. Bare river banks are very prone to erosion, especially during floods.

It is recommended that all opportunities are taken to reduce the spread of balsam along the Wellow brook. If this is not done, extensive bank erosion may develop.

Willow bank revetment

At a few locations, on the outside of bends, dead trees (elms and alders) may soon allow rapid river bank erosion to develop. It is recommended that this erosion is slowed down or stopped by 'spiling' the banks with live willow. This involves staking the bank and

weaving live withies between the stakes against the soil, so as to promote rapid root growth. The roots stabilise the bank and the living willow armours the bank from direct erosion by the current. Sometimes a backing of hessian or coir membrane is needed to produce extra protection until the willow becomes established. A simpler approach, which may be adequate, is simply to stake the bank with goat willow (sallow) stakes, allowing new bushes to grow. In view of the fact that we only spotted one goat willow, it may be necessary to 'beg, borrow or steal' some live willow from local fisheries! Nick Giles Associates will be pleased to quote for this work.

Notes on bank erosion

- 1/. Bank erosion is a natural process important for the dynamics of rivers.
- 2/. Unless carefully thought out, erosion control can be expensive, ineffective, reduce fishery and conservation values, create problems downstream and be an eyesore.
- 3/. 'Green' approaches, using natural materials are always preferable, as long as they will be effective in a given situation.
- 4/. Take advice before 'going it alone'.

Fishery management plan

It is recommended that a detailed Wellow brook fishery management plan is developed, this should include the following elements:

- Spawning riffles to be jetted.
- Spawning riffles to be enhanced with new gravel.
- Trees to be coppiced.
- Areas of eroding bank to be revetted.
- Pools and glides where added log cover would improve trout habitat.
- A reconsideration of the need for and best approach to stocking.
- A costed plan which can be used as a basis for fund-raising initiatives.

Nick Giles Associates will be pleased to help with any of the above actions.