Trout Talk

GO WITH THE FLOW

Beware of control-freakery in riverbank management. In many cases Mother Nature knows best, says *Paul Gaskell* of the Wild Trout Trust

DON STAZICKER WTT

Fishing a lateral scour pool produced by natural erosion.

ONE OF THE attractions of fishing running water is, of course, that it runs, the ever-shifting medium providing a continual and refreshing variety to each fishing trip. How strange, then, that we river anglers are often so unnerved by the fact that the "hard bits" of the river (the bank and the bed) like to move around, too. This month's piece is where we get into the realm of "geomorphology", a long word for the study of landforms and the processes that shape them. In the case of rivers this means the weathering of rocks and the washing of the resultant material downstream.

NATURAL PROCESSES

Fundamentally, our rivers pick up bits of rock and soil and move them to the sea, dropping them for varying amounts of time on the way. This process is, of course, what gives rise to spawning gravels as well as determining the distribution of boulders, cobbles, sand and silt.

Apart from near-vertical plunges on the very steepest mountain slopes, running water loves to wiggle from side to side. Anyone who has been stuck inside a car on a rainy day can testify to the random zig-zagging path of the raindrops down the windscreen. Minuscule imbalances in the forces acting on one side of the drop as opposed to the other steer it left and right as gravity sucks it earthwards. An exact parody of that process on a much larger scale produces the meandering course of rivers.

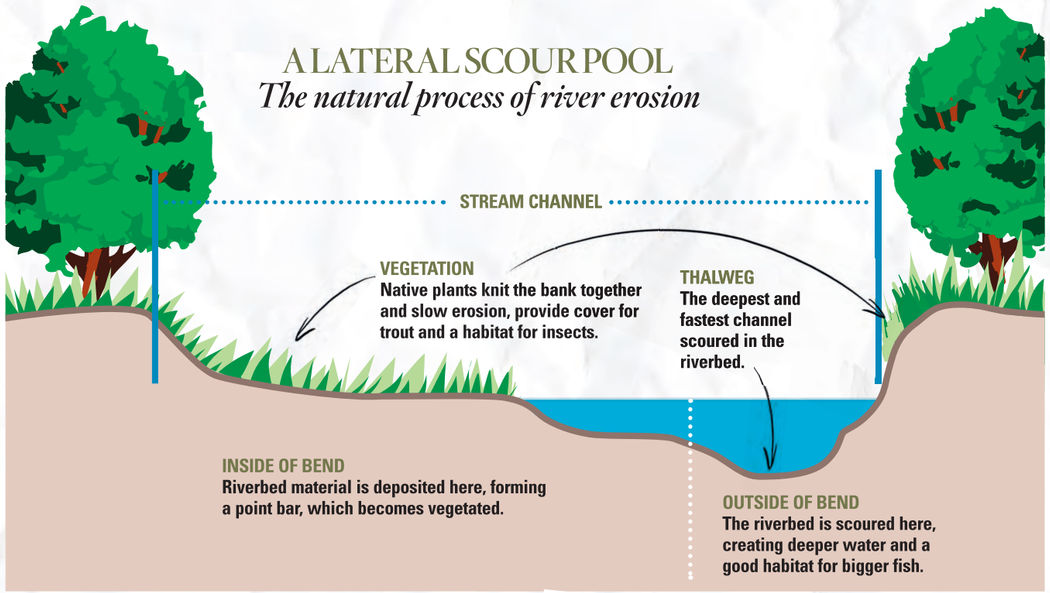
The "wiggling forces" have an increasing influence as decreasing gradient (and consequently gravity) loses its ability to compel the water seawards along a more direct path. This is why lowland reaches tend to have much more extravagant meanders than hillside reaches of the same river.

As a river meanders, it gives rise to scoured deeper pools on the outside of bends, and drops some of its cargo of solids on the inside of each one – a process known as "lateral scour". The bit of the channel where the water is both deepest ➤

Trout Talk

continued

A LATERAL SCOUR POOL
The natural process of river erosion



and most strongly flowing is called the "thalweg" (German, literally meaning "valley-way"). The deposited bed material forms "point bars" that often become vegetated. Thalweg and point bar formation give rise to variety in depth and flow over the cross-section of the river – vital for different life stages of fish and a variety of plants and invertebrates, too. Variety in habitat is a good thing (I think I've mentioned that once or twice before during these articles…).

The great thing about scour pools is that, unlike damming a river to hold back water in a pool, they do not silt up (unless the river moves a bit more and creates a replacement pool!). If you are looking to cast at big fish, the outsides of bends with a little bit of cover are prime hunting grounds. Suitable cover is provided by healthy riverbank flora, including both an underlying layer of vegetation and mixed-age trees (in the ideal world). Where a good variety of native plants grow there is both an extensive root system knitting the bank together and a variety of perennial plant foliage (*eg* sedge grass leaves) that keeps bank erosion to a rate that is good for the ecology of the stream.

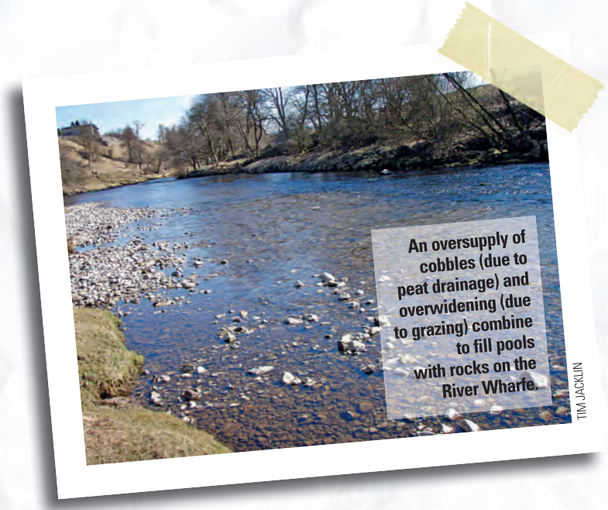
In other words, with good surrounding vegetation, bank and riverbed erosion occurs at a sufficient rate to replenish spawning gravels and to dig lovely pools without swamping the river with fine sediment.

One of the most common phrases that I come across on site visits (especially to upland rivers!) is: "A few years ago the river used to run right over there. Now it has moved yards this way – we need to dredge out the riverbed and put it back." Quite often anglers (including me, if I'm lucky) will have fished up the "defective" section of river that is in the "wrong place" and caught dozens of trout. Something strange is going on in our angling brains on this front because the same sentiment comes up time and again – despite wonderful fishing. I think it may be to do with our human desire to control or master nature.

Assuming that the movement of the river is not threatening houses, footpaths or other important constructions, it is a very good thing that it is not locked in place for eternity. The Victorians were especially keen on human


Sediment run-off is worse when fields are ploughed towards the river.

SHAUN LEONARD


An oversupply of cobbles (due to peat drainage) and overwidening (due to grazing) combine to fill pools with rocks on the River Wharfe.

TIM JACKLIN

mastery over the natural world and, when straightening rivers for their own purposes, would construct riverbanks from stone and rubble before planting alder trees among the rocks. They certainly knew what they were doing – because in most cases, the matrix of rock rubble knitted together by tree roots has not moved in well over a century!

Unfortunately, without those rejuvenating inputs of gravel and periodic shifting of the pool and riffle locations, opportunities for thriving diverse flora and fauna are lost. Erosion, as with most things, should be treated as one of those "little bits of what you fancy" that do you the world of good.

Chalkstreams are an interesting case, as the modern-day examples that we fish in England have all been modified by human intervention. Yet the managed chalkstreams with the very best fish and fly populations allow for bed erosion, healthy and diverse bankside vegetation and meandering flow. They must, for example, be sufficiently narrow to support scouring flows to rejuvenate spawning gravels and produce deeper pots or bend pools to hold adult fish. Clearly, where channels are "perched" (*ie* the water level is maintained some way above the valley bottom) we have to be careful with promoting bank erosion. This is true of many chalkstream carriers.

WHAT COULD POSSIBLY GO WRONG?

In the healthiest "upland" river systems, the headwaters arise on spongy bogs that absorb and then slowly release water derived from (often considerable) precipitation. The presence of native woodland also encourages rainfall to soak into the spongy ground – rather than to flash straight into the river system. We are all abundantly aware of the dangers of over-abstracting groundwater (witness the loss of weed in many of our chalkstreams subjected to crippling low flows and grazing pressures in recent years). However, changes in land use in upland areas often remove the "buffering" effect of peat bogs and deciduous woodland.

Mass deforestation or drainage channels for both intensive forestry and for peat extraction make spates much more severe and much more short-lived. This frequently blasts erodible material (anything from fine clay up to large cobbles) into the river system from the headwaters at an overwhelming rate, the Wharfe and Prysor being notable examples.

By contrast, when headwaters are dammed to make reservoirs, the supply of vital spawning gravels can be cut off. As in all things, it is the balance that is important.

There can also be direct inputs of excessively fine sediments resulting from surrounding land-use such as ploughed fields (particularly when ploughed towards the river instead of in parallel), high densities of livestock in the absence of fenced and vegetated buffer strips and direct run-off from roads.

The various human activities causing additional inputs of fine sediment tend to raise the rate and duration of supply above the levels that would be naturally occurring. Smothered spawning gravels, elevated nutrient levels and fewer sediment-intolerant invertebrates are likely consequences.

The size of the channel can be increased to the point that water flows too slowly to redistribute the bed material. This could come about by deliberate engineering (typically widening and/or straightening) or may arise through rampant bank erosion. The most common cause for inappropriately high rates of bank erosion is the dual impact of excessive trampling as well as overgrazing of vegetation produced by livestock.

When banks sport only close-cropped turf and an associated shallow root system, the river will carve out swathes of earth with every spate – causing loss of quality habitat (and potentially elevating inputs of silt and sand). A similar effect can result from infestations of non-native plant species that are capable of out-competing our native flora. Himalayan balsam and Japanese knotweed frequently achieve near total domination of riverbanks when left unchecked. They then die back in winter to leave bare banks that are swept away by winter spate flows.

If your fishery is affected by an over-supply of sediment (coarse or fine), the WTT can give guidance into possible solutions. Similarly, out-of-control bank erosion can be tackled with techniques that also provide excellent habitat for fish and invertebrates. However, do look very carefully at areas of eroding banks before deciding that you have too much of a good thing. If the erosion is happening in banks with healthy and diverse native vegetation, it is probably helping your fishery rather than hindering it.

Factfile

The Wild Trout Trust is always available to offer free advice on creating parr, spawning and adult habitat in your stream. Contact the Trust via its website at www.wildtrout.org or call 023 9257 0985.

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