

Managing woody debris

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Background

Woody debris is a natural component of river systems. It falls naturally into the water from bankside trees, lodging in the channel or being carried by the flow until it settles.

The woody debris can vary in size from small twigs to whole trees. The smaller material, including twigs, leaf litter and smaller branches is usually referred to as brushwood or Coarse Woody Debris (CWD), with the term Large Woody Debris (LWD) reserved for larger timber, including substantial branches, root boles and whole trees.

The benefits of woody debris to rivers are well documented in published literature. Amongst others, these include:

- Increased scouring of the bed, promoting channel diversity and the improvement of spawning gravel for trout
- Providing protection to banks from excessive erosion
- Increased resilience to climate change by regulating temperature and water level
- Providing shelter and food for a range of fish and invertebrate species

It is therefore very important that we value woody debris, and ensure that a balance is struck between access for fishing and the ecology of watercourses, in particular for trout habitat.

Objective

Subject to other constraints including perceived flood risk and excessive erosion, the management objective should be to retain as much woody debris within the channel as possible. **DO NOT REMOVE WOODY DEBRIS UNLESS THERE IS A GOOD REASON TO DO SO.**

Location

Woody debris is valuable throughout a river system. However, its value for trout is particularly important in smaller streams, and where it occurs near to spawning sites. The cleaning and sorting of gravel by scouring caused by woody debris is vital to ensuring the correct conditions for trout spawning.

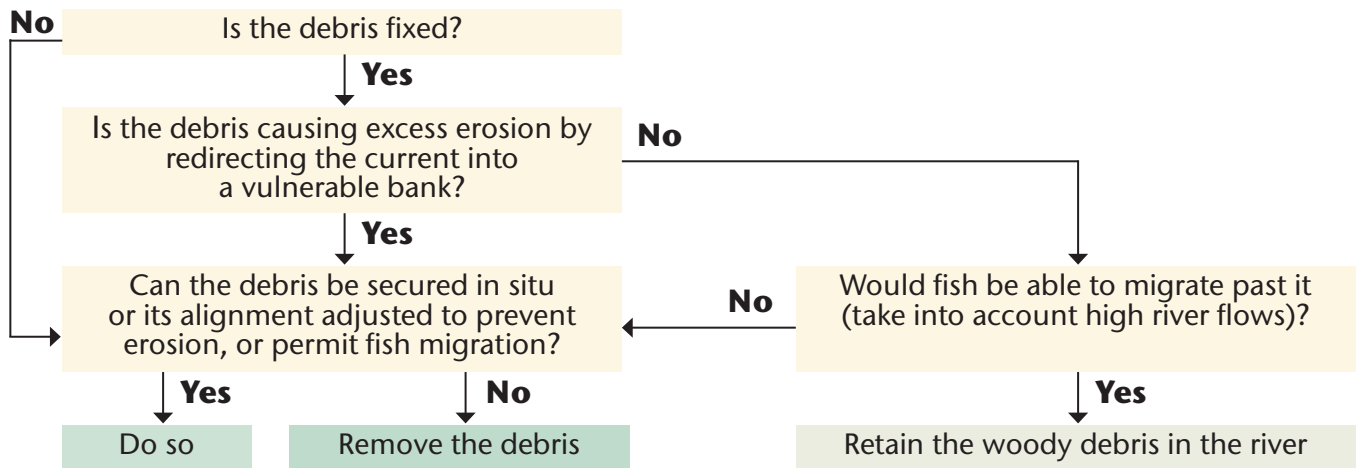
Woody debris scouring potential spawning gravel



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Method

Retaining fallen timber in the river is the best way of increasing the abundance of LWD. The decision tree below can be used as a guide for retention or removal of woody debris.



Adding LWD and CWD to rivers is best achieved by coppicing or pollarding of riverside trees (see **Managing Trees**). Brushwood arising from felling can be tied together using twine and pinned in with untreated wooden posts and wire along bank edges. A dense mattress of these bundles can provide excellent cover for trout fry and will help to prevent excessive bank erosion.

LWD can be added by using a tear cut in bankside trees, and hinging the timber into the river where it can be fixed using rebar driven into the bed through pre-drilled holes in the timber, or by fixing the trunk with wire to wooden posts driven into the bed. Where it is not possible to use hinged timber, cut trunks and large branches can be used in the same manner. Care should be taken to key them into the bank, to minimise erosion. For the same reason, LWD should normally be fixed facing upstream in the channel. Where possible, leave as many of the smaller branches as possible on the trunk. LWD can also be used to create deflectors in mid-channel. Paired sections of LWD can be fixed to the bed in an upstream ‘V’ shape, resulting in the creation of a pool and short length of well-sorted gravel suitable for spawning trout.



Upstream facing ‘V’ deflector

Monitoring

Fixed point photography is probably the most useful method of monitoring changes over time resulting from LWD retention and installation. A series of photos taken every 3 months over a period of 5 years will graphically illustrate any impacts from the work. Careful observation should also highlight what size, type and alignment of LWD/CWD have proved to be the most successful. Recording of fish activity during the winter period, including redd counts pre and post-work, should also reveal any improvement in trout spawning.