

# Large Woody Debris in Channels

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## Large Woody Debris “Sediment”:

### Production, Recruitment, Transport, Retention, Function (Physical and Biological)



<http://www.fsl.orst.edu/cfer/research/resproj/lrgwd/lrgwd.html>  
[http://www.fisheries.nsw.gov.au/aquatic\\_habitats/aquatic\\_habitats/snags](http://www.fisheries.nsw.gov.au/aquatic_habitats/aquatic_habitats/snags)  
[www.aslo.org](http://www.aslo.org)

## Physical effects

- Slows flow and traps sediment that would not otherwise be stored
- Transition from “plane-bed” to low-gradient “pool-riffle” channels, under a particular sediment-supply and flow regime, can be controlled by the presence of LWD
- Protects banks from scour
- Forces scour of pools and creates bars/spawning beds
- Beechie and Sibley 1997, Nelson 1998

## Effect of LWD loading on frequency of pools

The more LWD the closer the pools are spaced along the channel – i.e. there are more of them

Montgomery et al., (1995)  
Water Resources Research

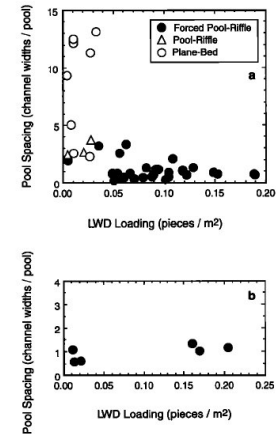


Figure 4. LWD loading versus pool spacing for (a) pool-riffle, plane-bed, and forced pool-riffle reaches and (b) step-pool reaches.

### Biological Effects

- Creates flow complexity for energy-saving growth of fish
- Shelter of fish from predators
- Invertebrate food substrates
- Algae and bacterial retention of nutrients (e.g. N)

### Loading (pieces or m<sup>3</sup> per km) depends on

- Rate of riparian tree production
- Size and durability of riparian trees
- Channel width
  - wider channels trap larger pieces mainly in pools
  - smaller channels more thoroughly disturbed
- Channel gradient
- Recent watershed history (fire, landsliding, flooding, logging/salvage; LWD removal)

### Unwelcome effects

#### Not always real, but need evaluation

- Increase hydraulic roughness and reduce the flood conveyance capacity of rivers --- only if >10% of channel cross section, but ...
- Can wash downstream and block bridges, etc.
- Increase local bank erosion
- Endanger watercraft and swimmers
- Esthetics --- thought to be 'messy'.