Forest Practice Guide

Non-Regulatory

Harvest Slash
6.4 Slash Traps

What is a slash trap?

Slash traps are generally constructed in the channel of a *river*. The aim is to catch larger pieces of *slash* that would otherwise be transported out of a *catchment* in flood flow conditions.

Slash traps are best made from rammed railway irons or steel beams threaded with wire rope and anchored solidly at each end. They have proven effective in *catchments* of several hundred hectares.

Please refer to the 'how to use' section of the introduction at http://docs.nzfoa.org.nz/forest-practice-guides/ for advice on how to use this guide.

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A Where and when to use

1. Use in high risk harvest and post-harvest *river* and *stream catchments*, where *slash* could be mobilised in flood events.
2. Use to limit *slash* movement downstream from the forest where it could cause problems for downstream property owners or infrastructure (e.g. roads, *culverts*)
3. Aim to install *slash* traps when road lining operations commence, where practicable.

B Where not to use

1. If the natural alignment of the *river* or *stream* channel will be altered.
2. If the *slash* trap will change the *river* gradient, by debris building up behind the structure and creating a weir.
3. If the *slash* trap will cause erosion of the banks and bed of a *river*.
4. If the *slash* trap will adversely affect downstream properties.

C Design

1. Design for:
   a. A minimum six year engineered life. *Slash* traps need to last long term.
   b. Free movement of water through the structure.
   c. Fish passage.
   d. Trapping the larger debris only, rather than trapping or damming all debris.
   e. Machine access to clean and maintain the structure.
   f. Ease of checking after storm events (near road access or good drone access).
2. Position at right angles to the *river* or *stream.* If there is a natural bench then slightly angle it downstream to aid *slash* being deposited onto it.
3. Construct the slash trap in a low gradient reach of the *river* to minimise the combined energy of water and weight of debris on the trap during peak flows. This helps to minimise the chance of structural failure.
4. A resource consent is needed to install *slash* traps in *catchments* larger than 20 ha, unless the *slash* trap is located on a terrace on one side of the *river* or on a low *river* terrace. The terrace(s) should allow the overflow of any excess material that may build up against the trap, to reduce pressure and risk of the structure failing.
5. Locating the *slash* trap adjacent to a large flat area above flood flow level is preferable, to provide storage for any debris that has been intercepted by the trap and needs to be removed. This will reduce the cost of maintaining the *slash* trap.
6. Document and take photos of location, design and construction.
7. Resource consent may be required, check prior to construction.
8. Consider whether a series of *slash* traps (two or more) would be a better solution than one *slash* trap.

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D Construction

1. For maximum structural strength, use the largest railway iron gauge available or appropriately specified steel universal beams, such as I-beams or RSJ's.
2. Drive the irons/beams into the *river* bed.
3. Ensure the spaced iron/beam uprights are not too close to each other to avoid trapping too much material.
4. Support railway iron/beam uprights with a wire rope.
5. Anchor the wire rope to deadmen or large trees on either *river* bank to secure the *slash* trap.

Slash captured by *slash* trap installed upstream of road and bridge. Accessible site allows removal of *slash* and maintenance of the *slash* trap.

E Maintenance

1. Prepare a routine maintenance plan including heavy rainfall response measures.
2. Maintain the slash trap to a maximum of two thirds storage capacity at all times.
3. Visit *slash* traps within five working days after a storm event that could have mobilised *slash* (5% *AEP* or greater).
4. Clear debris within 20 working days after a storm event.
5. Put cleared debris beyond the flood plain, or beyond where it could be mobilised by a flood event up to a 1 in 20-year event (5% *AEP*).

F Reporting

(to meet the National Environmental Standards for Plantation Forests)

1. Provide a written report to the regional council within 20 days of the construction of a *slash* trap.
2. Provide a written report to the regional council by 31 March each year that includes:
   a. Frequency of maintenance and clearing.
   b. *Slash* trap condition and performance.
   c. Any damage to downstream property, *stream* bed disturbance, fish passage blockages.

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Technical specification guidelines

1. Build the trap at least 0.5 to 1.0 m higher than the *river* banks.
2. The irons/beams should be up to 2 m above the *river* bed (if higher, a resource consent is required).
3. Drive irons/beams into the *river* bed to a depth of at least 1.5 m.
4. Space railway irons/beams 1.5 to 2 m apart and no closer than 1.5 m.
5. The irons should be no more than 2 m above the *river* bed (if higher, a resource consent is required).
6. Use a wire rope (minimum 22 mm diameter).
7. Ensure there are smooth-sided holes cut in the upper sections of the irons/beams (for threading the wire).
8. When anchoring the wire rope to the deadmen or large trees, insert a knot in the rope and supporting clamps, on either streambank to secure the *slash* trap.
9. Maximise tension in the rope.
10. Secure clamps to the wire rope immediately on either side of each railway irons/beams to create rigidity. Clamps stop the irons/beams from being forced out of alignment when under pressure.
11. Short logs or railway irons/beams can be driven into the terraces adjacent to the *slash* trap, to catch more material in high flows.
12. If it is likely that trapped debris could divert *stream* flow during a flood event, the bank should be armoured to prevent scouring.
13. Refer to Debris Flow Control Structures for Forest Engineering, D.F. VanDine, British Colombia Ministry of Forests 1996 and www.geobrugg.com/en/Debris-flow-barrier-UX-7949,7859.html.

National Environmental Standards for Plantation Forestry

Particular relevant provisions for managing *slash* are Regulations 83 – 92.

Contact

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Other Practice Guides in this series

Visit: **https://docs.nzfoa.org.nz/forest-practice-guides/** to view all guides

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