



Temporary log crossings in NSW coastal State Forests

This note addresses the use and effectiveness of temporary log crossings over headwater streams within forestry operations in NSW coastal State forests. This work was performed by Jacobs Group Australia Pty Ltd as part of the [NSW Forest Monitoring and Improvement Program](#) and relates to the [Coastal IFOA Monitoring Program](#).

Temporary log crossings are used to cross headwater (ephemeral) streams in forestry operations. They were included in the NSW Coastal Integrated Forestry Operations Approval (Coastal IFOA) in 2018 on the basis that they could, in some settings, provide better environmental performance than traditional causeways also provided for in the CIFOA.

Why was this research done?

Temporary log crossings are used across different forest contexts in other countries and Australian states. Despite being permitted under the Coastal IFOA, they are not being widely used during native forestry operations in NSW coastal state forests. To fill the knowledge gap, Jacobs reviewed their effectiveness and appropriateness for use compared to traditional crossing types.

This research was identified by the EPA and FCNSW during the annual Coastal IFOA health checks overseen by the Commission.

How are causeways and temporary log crossings different?

The Coastal IFOA provides flexibility for the forest manager in deciding whether to install a causeway crossing or a temporary log crossing at any headwater stream to access the harvesting area (**Figure 1**).

Causeway crossings: Are a permanent change in the streambed profile using cut and fill earthwork techniques. The streambed floor is fully exposed to impacts from log extraction (dragging) and machinery tyres and/or tracks which cause rutting, compaction and deformation. The crossing cross section requires rehabilitation measures after use.

Temporary log crossings: Use logs to fill the streambed to the minimum level required for extraction machinery trafficability. The presence of logs in the streambed prevents direct contact from the machinery tyres and extracted logs with the streambed floor, though some compaction to the streambed is sustained. The logs remain in situ for a short period and are then removed.

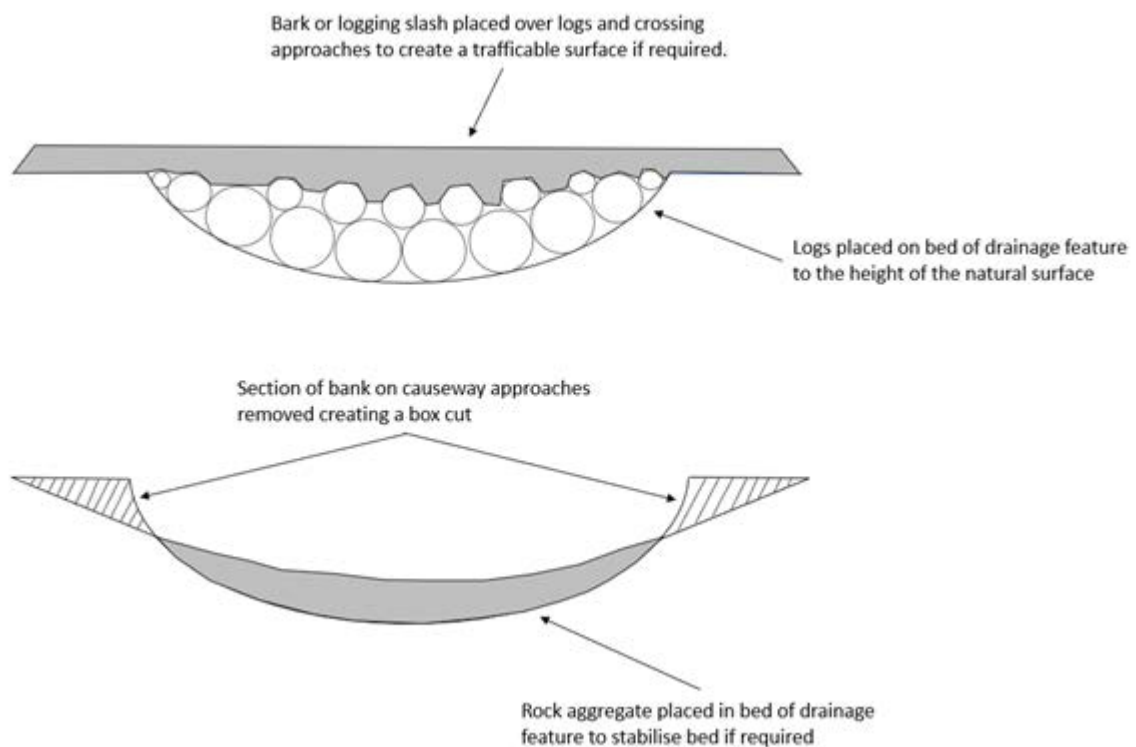


Figure 1 : Conceptual models of temporary log crossings (top) and causeway crossings for snig tracks (bottom) (adapted from NSW Forestry Corporation, 2021).

What did the research find?

When used appropriately, temporary log crossings were found to have a range of advantages over causeways in relation to waterway disturbance and risk of sedimentation during rainfall events, including:

- machinery and logs pass across the log fill and do not directly disturb or deform the bed or banks
- in steep sided streambeds, the log fill lifts the traffic above the channel where a causeway would require excessive excavation and disturbance to the channel and banks
- the log fill used acts to partly intercept any soil or other debris dragged onto the crossing footprint
- less effort and resources involved in rehabilitation with lower risk of sedimentation from the crossing point.

The researchers suggested ways the Coastal IFOA could be updated to encourage the use of temporary log crossings in suitable situations, for example aligning conditions required for both temporary log crossing requirements and traditional causeway crossings.

Where can temporary log crossings be used?

Temporary log crossings should be considered for use:

- where the approaches to a crossing point on a headwater stream are relatively steep and there is an incised channel - see **Figure 2 (a)** incised channel.
- to reduce disturbance in shallow crossings with damp soils that would not be able to resist machinery and log traffic - see **Figure 2 (b)** shallow crossing.

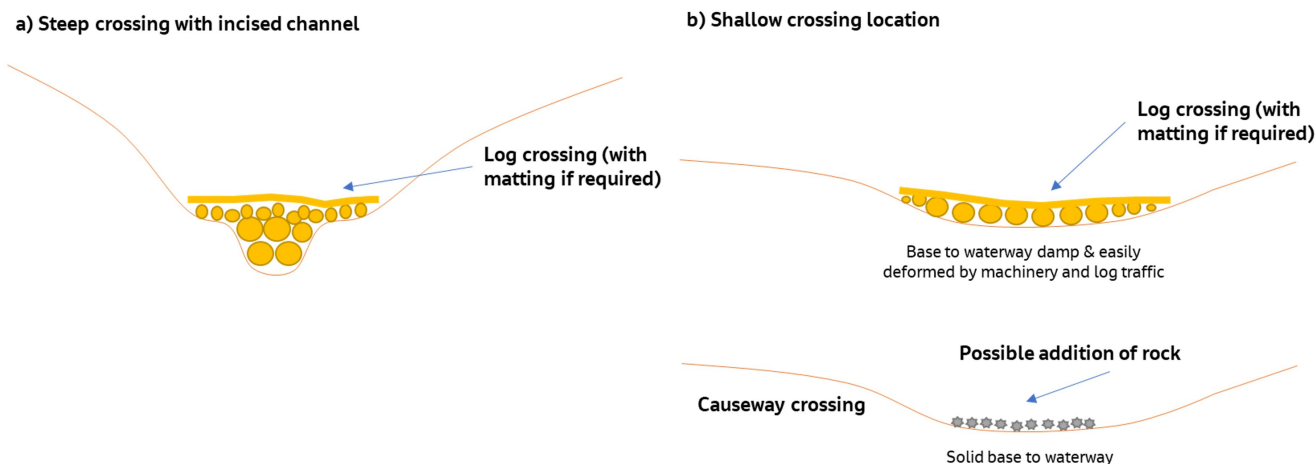


Figure 2 : Conceptual landscape settings for causeways and temporary log crossings.

In contrast, causeways would normally be a more appropriate for:

- streams with lower approach slopes and minimal channel incision, or
- crossings where the bed substrate is hard and highly resistant to erosion or deformation (such as rock or gravel).

How was this work done?

Jacobs reviewed published and unpublished sources to inform the report. They undertook multiple field visits to view temporary log crossing sites during and after use. This included engagement with FCNSW and EPA staff to discuss the practicalities and regulatory requirements related to implementation and management of temporary log crossings and other crossing types.

Dr. Peter Hairsine, Centre for Water and Landscape Dynamics at the Fenner School of Environment and Society, Australian National University peer reviewed the research.

Where can I find more information?

The technical report detailing the full findings of the project, can be found on the [Commission's website](#).

This research was funded under the [NSW Forest Monitoring and Improvement Program](#).