

### Impacts of establishment and harvesting (logging)

Since the 1970s, pine plantations in NSW have been planted on cleared agricultural land. On agricultural land, pines help prevent soil erosion and compaction, slow down the process of soil acidification, and may be used to lower the water table and reduce dry-land salinity.

Planting pines also leads to regeneration of native grasses, shrubs and trees in retained gully areas through a reduction in grazing pressure, improvement of soil organic matter, and minimal disturbance to the soil for 30 years or more - the life of the plantation.

And the big land care plus, at the end of the day, is pines are a highly marketable commercial crop.

### Blowering Dam

It is well recognised that trees are useful in protecting soil and water quality. At Blowering Dam near Tumut, a joint State Forests and Department of Land and Water Conservation project, planted pines on the dam's steep banks in the 1960s when the dam was constructed to prevent further soil erosion.

As the pines have matured they are being removed for commercial purposes (sawlogs and pulp) before being replanted. The Blowering site is too steep for conventional harvesting machinery, so the trees are being removed by cable.

Cable logging provides a major environmental gain because it minimises disturbance to the soil, as it raises the heavy section of the tree off the ground, before hauling it to the roadside.



Harvesting a plantation. Photo by Ross Dunstan.

### Why does logging have minimal environmental effect?

The practices employed in logging ensure that impacts on the environment are kept to a minimum.

However, all phases in the life of a plantation including establishment, road construction maintenance and harvesting are assessed for their environmental impact, prior to establishment, in accordance with the Environmental Planning and Assessment Act.

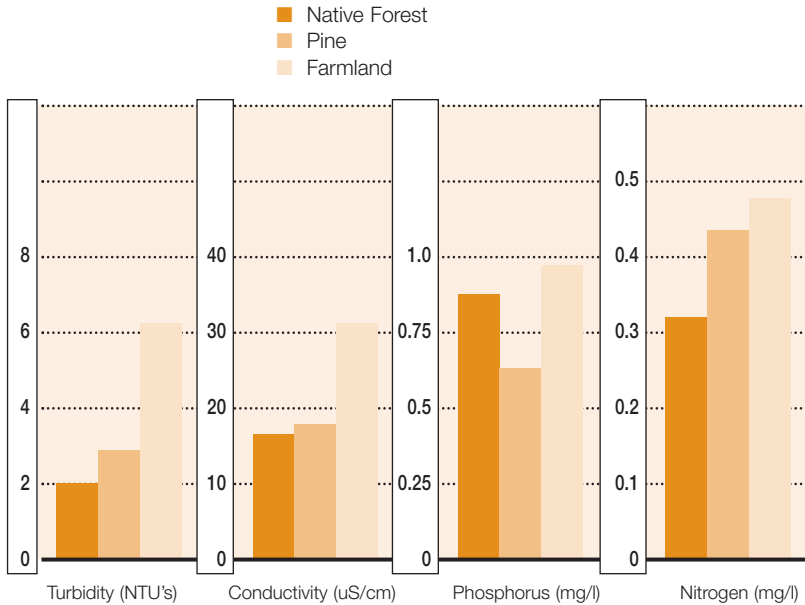
If it's feared there will be significant adverse impacts, then establishment will be modified appropriately.

Some examples of practices used at various stages in the life of a plantation include:

### Environmental care in site preparation

- ▶ Ripping along the contour of the land to prevent soil erosion.
- ▶ Drainage lines are protected when ripping and harvesting.
- ▶ Chopper rolling (a large roller with blades towed behind a bulldozer) breaks down stumps, slash, organic matter, etc, leaving the material on site to mulch the soil and nourish the new crop with minimal disturbance to the land.
- ▶ Excavators with specially designed attachments are able to knock down and remove slash (branches trimmed from harvested trees), and also cultivate the site for planting, especially on steeper slopes.
- ▶ A strategic approach to management of areas of remnant vegetation on new plantations has meant that native vegetation is retained and gullies protected.

Comparison of Water Quality on Granite Soils - Bago Study



**Environmental care in road construction**

- ▶ Roads are now designed wherever possible to make use of ridges to avoid creeks, thus protecting water quality.
- ▶ Roads meet Environment Protection Licence conditions such as slope limits and ensuring road drainage does not directly discharge into creeks.

**Environmental care in harvesting**

- ▶ Harvesting machines use wide tyres with low ground pressure to help prevent soil compaction and rutting.
- ▶ Harvesting machines travel on beds of slash to prevent damage to the forest floor.
- ▶ Wet weather restrictions prevent machinery damaging the forest.
- ▶ An Environment Protection Licence issued by the Environment Protection Authority controls harvesting operations.

**Water quality from plantations**

John Turner, Veronica Lauck, John Dawson and Marcia Lambert studied water quality in Bago State Forest (including native forests and plantations) and surrounding agricultural areas near Tumbarumba.

Their research paper found that with careful logging and roading in a pine plantation, the effects on stream turbidity, electrical conductivity (as a

measure of salinity) and phosphorus concentrations, were less than from sites on nearby cleared agricultural land (see graph).

Source: J Turner, Veronica Lauck, John Dawson and Marcia Lambert 1996.

**Summary**

The impacts due to establishment and harvesting of plantations can be minimised with careful planning, use of the correct machinery, and properly trained and supervised staff.

The NSW plantation industry has initiated many improvements in establishment and logging practices during the years to be at the leading edge of 'World 's Best Practice'.

Examples include chopper rolling, spot cultivation, wide-tyred (low impact) machinery, cable logging on steep slopes and road design.

With a strong economically viable industry and constant monitoring and research these improvements will continue into the future.

**Further reading**

- ▶ J Turner, V Lauck, J Dawson and M Lambert (1996) 'Water Quality Monitoring Strategies for Forest Management A Case Study Bago State Forest', research Paper no. 30, State Forests of NSW Research Division.
- ▶ Anon (1995), Forests' Forest Practices Code Part 1 - 'Plantation Harvesting' and Part 3 - 'Plantation Establishment and Maintenance' (1997). State Forests of NSW.
- ▶ Bren L J, Papworth M (1993), 'Hydrologic effects of conversion of slopes of a eucalypt forest catchment to radiata pine plantation'. *Australian Forestry*, vol. 56, no 1, pp. 90-106.
- ▶ Cornish P M (1989), 'The effects of Radiata pine plantation establishment and management on water yields and water quality - a review. *Forestry Commission of NSW, Technical paper*, no. 49.
- ▶ Lewis N B and Ferguson I S (1993), 'Management of Radiata pine'. Inkata Press. Chapter 8. pp. 111-118.

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