

Managing our forested land for an adequate water resource.

Summary (by SAS) of submission by Dominik Jaskierniak on forest hydrology to the Tasmanian Regional Forest Agreement Ten Year Review, July 2007.

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Summary

Water shortages are potentially the greatest threat to Tasmania's social and economic well being. The *Forestry Growth Plan*, the *Intensive Forest Management Strategy* and the *Plantations for Australian: The 2020 Vision* do not account for the water resource and need to be re-evaluated.

The State needs to reassess the policy *Plantation for Australia: the 2020 vision*, given that this policy makes no consideration for the water resource and the Tasmanian forest industry has no integrated catchment management policy. It should be a concern that there is no explicit acknowledgment of other water users given the rate that the forest industry is expanding.

There are three reasons for concern. Firstly, the amount of area that has recently been established with plantations is not a trivial amount of area (i.e. 188,000 ha since 1990 plus another 23,400 in 2006 on private land alone). Secondly, the area that has had native forest converted into plantation predominantly consists of the most productive native forest sites (highest rainfall, deepest soils, most fertile soils, and most suitable aspect and topographic location) to maximise productivity at the expense of increased water use⁹³. Thirdly, the amelioration techniques that are applied resemble intensive agricultural systems which optimise productivity by increasing the plantations efficiency at intercepting water.

Recommendations to the RFA ten year review

1. The Tasmanian Regional Forest Agreement (TRFA) in its proposed form does not adequately recognise or address the impact of current forestry practices on the water resource. As such, if the TRFA proceeds in its proposed form, there will be reduced water security for members of our society that rely on the water resource for their livelihood.
2. The forest industry needs to develop an Integrated Catchment Management Policy to manage forested catchments for an adequate quantity of stream flow that meets environmental and community needs.
3. The scientifically appropriate level of forestry development needs to be determined for all forested catchments in Tasmania based on each catchment's environmental water requirements as well as societal water needs.
4. A moratorium for forestry practices within catchments of town water supplies and freshwater aquaculture facility intakes, and all plantation conversions on private land, and old growth logging should be implemented until the appropriate level in point 3 is achieved.
5. The Tasmanian forest industry needs to develop a policy on climate change and adjust the sustainable timber harvesting yields to account for: (a) the climatically reduced water resource; (b) the reduced stand growth due to a drier climate; and, (c) the recent changes in the health and vitality of our timber growing resource.

Lessons from the Ringarooma Catchment

The Ringarooma catchment, like every other major catchment in Tasmania, is in the process of having a *Water Management Plan* (WMP) implemented to determine how the stream flow regime can meet the environmental and social objectives of the community and Government. The Ringarooma WMP in its draft form identifies that there needs to be an increase in water for the environment under the *Water for Ecosystems Policy 1999*, and that this increased environmental flow should be addressed by reducing the availability of water for irrigators. The scenario put forward by DPIW will result in a seasonal reduction of about 58% of present allocations for irrigators. The irrigators in this study expressed concerns that they should not have to meet the full cost of providing the increased environmental flows when plantation forestry is largely contributing to the reduced stream flow situation. The study estimates that the potential reduction in agricultural production in the catchment is \$9.3 million per year at the farm-gate. Flow-on losses at the State level was predicted in the vicinity of a further \$17 million, with a potential loss of 78 jobs statewide.

The developed forest industry in the Ringarooma Catchment had little consideration of other water users during the establishment period, when decisions were made for the appropriate scale of the industry within that catchment. To avoid economic loss to the community, ICM principles should have been implemented prior to developing the forest industry in the catchment. These types of problems will reappear in other WMP because the forest industry has no ICM policy.

Background

- There is a great deal of uncertainty in the future availability of the water resource as pointed out in the *Report on Water Availability in Tasmania (2001)*. Prior to the 2002/03 and 2005/6 dry spell, the 2001 report acknowledges that close to all rivers in Tasmania were under stress during dry summer periods³⁷. Since 2001, conditions have become much worse, *partially* due to the rapidly expanding forest industry
- It needs to be recognised that there were water shortages before the recent accelerated rate in timber harvesting. A great majority of the new regenerating forest and established plantations have replaced 100-200 year old trees which use a lot less water than regenerating forest. **Every new harvested area that results with an increase in stand growth over the regeneration period will reduce stream flow.**
- The relationship between forest productivity and forest water use is an important concept in forest hydrology and its recognition has been omitted in Tasmania's forest management. Generally speaking, the period when the trees grow the quickest is the period when the trees use most water. The timber industry optimises its timber resource yield by harvesting trees at an age when sawlog timber growth rate slows down, as it becomes more economically viable to harvest the timber and regenerate a faster growing forest. Tasmania's sustainable timber yield calculations determine the harvesting rotations with no scientific evaluation to determine an appropriate restrictive measure that accounts for the catchment-specific water resource demand.
- The sustainable timber yield target has remained unchanged over a period when: southern Australia has experienced the biggest drought in modern history; the International Panel on Climate Change (IPCC) predicts that, "as a result of reduced precipitation and increased evaporation, water security problems are projected to intensify by 2030 in southern and eastern Australia", and; the predicted reduction in rainfall will mean that the forests may not regenerate as vigorously over subsequent rotations.

- Younger regenerating trees contribute to dryer conditions as a result of higher water interception rates and hence are associated with less drainage of groundwater flow down hill-slopes towards streams. Vigorous regrowth in the upper slopes of a landscape will inevitably result in forest stands down slope being more vulnerable to dieback episodes associated with natural climatic extremes.
- During drought conditions when trees are stressed there is an increase in insect outbreaks. It is alarming that in 2005/06, 43% of all plantation area monitored for chrysomelid leaf beetle plagues exceeded the acceptable economic injury threshold level. As a consequence of drought, over the last five years spraying of chemicals has increased from 761 ha to 3,589 ha.
- It is shown that 92% of the 158,900 ha of hardwood has been established since 1990, and 60% of the 71,500 ha of softwood has been established in the same time period. As a total, 82% of all 230,000 ha of Tasmanian plantations in 2005 have been established since 1990. The report *Private Property Plantations in the Landscape in Tasmania as at 31 December 2006* has raised the plantation estate to 254,207 ha after another accelerated year of plantation establishments. Since 1990, a significant amount of Tasmania's water resource has been allocated to the plantation industry for the first time.
- Plantations do not use the same amount of water as regenerating native forests of the same age. Plantation management on Tasmania's State Forest land and private land involves soil cultivation, weed control, optimised tree spacing, fertilisation, thinning, pruning, and planting of genetically selected vigorous strains of trees. Chemical weed control and annual applications of nitrogen and phosphorus for the first few years of growth are usually necessary in achieving an optimum growth response. The application of fertiliser is capable of producing a three-fold increase in wood production for a 9.5 year old *E.globulus* plantation. Intensive cultivation promotes effective root accessibility to soil water storages which increases growth rates of plantations on soils that would otherwise naturally impede rapid colonisation of root systems and hence suppress above ground growth rates. Genetic selection methods are advancing rapidly to escalate plantation productivity. Improvements of *E.globulus* through genetic variation alone have provided stem volume gains of more than 15% and wood density gains of 10%. These plantation management strategies increase growth as a result of the optimised water resource capture.