Progress Report SP 2000-003

Hydrological response to timber harvesting and associated silviculture in the intermediate rainfall zone of the northern jarrah forest

Ecosystem Science

Project Core Team

Supervising Scientist	Joe Kinal
Data Custodian	
Site Custodian	

Project status as of Dec. 19, 2018, 9:58 a.m.

Approved and active

Document endorsements and approvals as of Dec. 19, 2018, 9:58 a.m.

Project Team	granted
Program Leader	granted
Directorate	granted

Hydrological response to timber harvesting and associated silviculture in the intermediate rainfall zone of the northern jarrah forest

J Kinal, G Liddelow

Context

This is a long-term experiment established in 1999 to address part of Ministerial Condition 12-3 attached to the *Forest Management Plan 1994-2003*. Ministerial Condition 12-3 states that the Department shall monitor and report on the status and effectiveness of silvicultural measures in the intermediate rainfall zone (900-1100 mm/yr) of the jarrah forest to protect water quality.

Aims

Investigate the hydrologic impacts of timber harvesting and associated silvicultural treatments in the intermediate rainfall zone of the jarrah forest.

Progress

- Monitoring of groundwater levels, streamflow, stream salinity and stream turbidity continued in Yarragil 4X and 6C (treated), and Wuraming (control) catchments.
- Monitoring of groundwater levels, streamflow, and stream salinity continued in Yarragil 4L, which was thinned in the mid-1980s, to examine the effect of thinning on stream water quality and quantity.
- A paper reviewing the long-term hydrological response to thinning in Yarragil 4L was submitted for publication in the *Journal of Hydrology*.
- Groundwater bores were located and re-measured in experimental catchments in the Warren Region including Crowea, Iffley, Poole, March Rd and April Rd. More than 80 bores were measured, with 45 still being in contact with groundwater.

Management implications

- These catchments provide a unique long-term record of the hydrological response of the jarrah forest to climate change and forest management practices.
- Monitoring in these catchments contributes to reporting to KPI 10 for the *Forest Management Plan 2014-23* which relates to stream condition and groundwater level within fully forested catchments.
- Monitoring in these catchments helps inform the effects of silviculture practices on water production.

Future directions

- Continue monitoring of groundwater levels, streamflow, stream salinity and turbidity and rainfall.
- Re-measure forest density along fixed transects in Yarragil 4X and 6C to determine the forest regeneration response to the timber harvest and silvicultural treatments.
- Re-measure tree growth in Yarragil 4L to determine the long-term response to thinning, and prepare a manuscript for publication.
- Progress planning for a second thinning in Yarragil 4L, 35 years after the previous thinning, to inform silviculture practices on water production.
- Review the network of existing groundwater bores in experimental catchments in the Warren Region to identify those bores which should be monitored to inform the mid-term performance report on KPI 10 of the *Forest Management Plan 2014-23*.