

5. TREATMENTS

Recognising that controlled catchment experiments are expensive to establish and maintain, every attempt has been made to select treatments that will provide information currently being sought by various government agencies and the community on the effects of given forest practices on water yield and quality. Many factors have been taken into account before deciding on the type and scheduling of treatments.

Several catchment characteristics have severely constrained both the type and scope of treatment that can be implemented at Reefton. The catchments are steeply sloped, and a significant portion of most catchments has slopes that preclude a logging treatment under current management prescriptions relating to operations within Victorian water supply catchments. Since prescriptions will be strictly adhered to, this has seriously limited a thorough examination of an intensive logging operation. To deviate from current prescriptions in order to increase the portion of a catchment treated would yield worthless results as they would not be applicable elsewhere. The species composition and sawlog quality of the catchment vegetation has also been a limiting factor considering appropriate treatments. Most of the catchments contain low quality eucalypt forest of little commercial value. Logging in some catchments prior to their selection has compounded this problem. Consequently, any treatment involving logging (sawlog and/or pulpwood) of a significant portion of a catchment is not possible without some simulated approach, particularly when the steep slopes are taken into account. Finally, not all streams in the six catchments are perennial, and this combined with inter-catchment calibration relationships has largely determined the selection of one catchment to act as the control.

Catchment 4 has been selected as the control catchment. There are only small areas of productive forest on this catchment, and these are largely confined to steep slopes. The stream of this catchment is perennial, except in severe droughts, and the precision for detecting changes in annual runoff from catchments 2 and 3, and to a lesser extent catchments 1 and 6, against catchment 4 runoff is relatively high. The catchment also behaves normally in terms of water quality and bedload characteristics. Whilst improved precision in detecting changes in water yield and quality is desirable, catchment 4 is regarded as the optimum control catchment from those available when catchment slopes, vegetation and soils are taken into consideration.

The proposed treatment schedule for the remaining catchments is detailed below. The dates indicated for treatment implementation are however subject to seasonal conditions, and hence a delay in treatment could occur.

Catchment 1

It is proposed to use this catchment to study the effects of Fuel Reduction Burning (FRB) on water yield and quality. FRB is a technique used in Victoria and elsewhere to reduce the quantity of fine fuels on the forest floor using low-intensity fire. There is convincing evidence to demonstrate that FRB reduces the extent and severity of wildfires. The technique is most commonly employed in foothill or dry Schlerophyll forests on a cycle varying from a few to several years depending on factors such as forest type and locality. The vegetation in catchment 1 is broadly similar to that subjected to FRB in Victoria, though the technique is not used operationally in the vicinity of the catchments. Although FRB is widely practiced, there is only scant information on its environmental effects.

The quantities of fine fuels will be surveyed prior to the burn which is scheduled for autumn 1984. Control lines will be established to ensure that the burn is confined within the catchment boundary. The burn will be fully characterised and the catchment mapped according to several fire intensity classes.

Catchment 2

A rehabilitation treatment will be undertaken in this catchment. Potentially highly productive stands on the steep southerly aspect of the catchment will be treated using a variety of methods, with the overall aim being to reduce basal area of the stand over a significant portion (approximately 40%) of the catchment. Although details have not been finalised, it is envisaged that three methods will be employed. (i) Where possible, an integrated sawlog/pulpwood operation will be conducted using conventional methods. Sites so treated will then be regenerated by an appropriate method. (ii) On steeper parts of the catchment, a simulated clear-felling operation will be attempted whereby all trees will be felled by chainsaws with the felled trees being left in situ and their crowns subsequently burnt. Regeneration measures will follow. (iii) Finally, any areas of significant regrowth will be subjected to a timber stand improvement treatment involving stem injection (with an appropriate herbicide) of suppressed and defective trees. Substantial roading will be necessary to carry out these works. The treatment is scheduled for the summer of 1983/84.

Detailed records will be maintained of the volume of timber removed. Roads and snigging tracks will be surveyed. Other measurements to fully document the treatment will include an estimate of the area disturbed by logging machinery or burnt as part of the regeneration process.

Catchment 3

This relatively steep catchment contains little timber of commercial value and will be used to test the effects of roading on water yield and quality. If possible, roading will be of a similar type and intensity to that used in catchment 2. This would enable the effects of roading and logging to be separated. Every attempt will be made to include a stream crossing in the roading network, providing logging prescriptions for the catchments are not violated. The treatment is scheduled for the summer of 1983/84.

Catchment 4

This will act as the control catchment for reasons already outlined.

Catchment 5

Detailed treatment proposals for this catchment are yet to be finalised. It is envisaged however that the catchment will first be roaded and then logged the following summer. It is noteworthy that this catchment contains significant areas of 1939 E. regnans regrowth and good quality mixed eucalypt stands. The catchment therefore provides an opportunity to examine a relatively intensive logging operation.

Catchment 6

Treatment of this catchment will not be considered until preliminary results are available from the above treatments.