

**EXPERIMENTAL FIRES IN RADIATA PINE LOGGING SLASH WITHIN THE
KINLEITH FOREST DURING EARLY 1993¹**

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In the summer of 1993, the New Zealand Forest Research Institute (NZ FRI) and the Kinleith Region of Carter Holt Harvey Forests (CHHF) Limited cooperated in a small-scale experimental burning study involving fresh, cured slash fuels resulting from clear-felling operations of a mature radiata pine plantation near Pohaturua Rock. The primary goal of this joint venture was "to demonstrate the experimental fire technique designed to furnish fire behavior data in selected fuel types". Ten metre wide mineralized fireguards were constructed around one 50 m × 50 m plot and one 100 m × 100 m plot. Slope steepness was less than 5° at any particular spot. An electronic fire weather station was installed on site in late January 1993 to automatically record, dry-bulb temperature, relative humidity (RH), wind speed and rainfall on a daily basis as well as during the experimental fires; this information was in turn used to calculate the six standard components of the Fire Weather Index System. The preburn fuel weight per unit area or load, vertical depth, and bulk density of the organic layer or forest floor, downed woody fuels and understory vegetation were intensively sampled during the first half of February; fuel moisture content samples were taken just prior to ignition of each plot. The amount of fuel consumed was determined by undertaking a post-burn survey. Circumstances didn't allow for any burning until March. Three experimental fires were successfully carried out during the peak fire danger period in mid-afternoon on the days selected to burn. In spite of this approach, the prevailing burning conditions were still relatively mild (dry-bulb temperature ~18°C, RH 57-80%, 10-m open winds 4-5 km/h, 3-5 days since any significant rain, Fine Fuel Moisture Code (FFMC) 83-84, Duff Moisture Code (DMC) 11-13, Drought Code (DC) 246-256, Initial Spread Index (ISI) 2.0-2.5, Buildup Index (BUI) 20-23, and the Fire Weather Index (FWI) 4). No control problems were encountered. Flame lengths seldom exceeded two metres. The observed forward rate of spread across the plot ignited as a single strip head fire on March 9th averaged 144 metres/hour which is nearly identical to what would have been predicted for the pine slash fuel type of the newly released (1992) Canadian Forest Fire Behavior Prediction System. A unique aspect of the two point-source fires ignited on March 11th to simulate the incipient phase of fire growth were their use as a training exercise involving nearly all the stages involved in controlling a wildfire (i.e., detection,

¹Summary of a presentation made by the third author at the Forest and Rural Fires Associations of New Zealand (FRFANZ) 3rd Annual Conference, 4-6 August 1993, Wellington, N.Z. This paper should be considered as preliminary in nature and a more complete version will appear at a later date.

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reporting, size-up, initial attack fire suppression, containment, and mop-up); Whakamaru lookout tower, located 13 km from the plots, spotted the first point-source fire 13 minutes after ignition. Both fires were easily contained at less than about 0.1 ha in size by a 10-person crew using hand tools and water delivered from a hose lay off of a ground tanker. The chronological development of each fire was captured on videotape in addition to 35 mm still photography. The three experimental fires represent the first quantitatively documented experimental fires in the history of New Zealand forest and rural fire activity. As it turned out, the fires served a dual purpose. NZ FRI met its research objectives and CHHF was afforded what was in many respects, a novel training opportunity; there is no reason why this demonstration trial couldn't serve as a model for other forest and rural fire authorities in New Zealand. The three experimental fires conducted in the Kinleith Forest during March 1993 constitute a modest beginning of what hopefully will be a continuing research programme investigating forest and rural fire behavior and its relation to suppression effectiveness and resource productivity. Furthermore, the Kinleith study illustrates well the gains that can be made when fire researchers and fire managers agree to collaborate on a mutually beneficial endeavour.

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