

Deterioration of Fire-Killed Trees in the Rocky Mountain Region

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Introduction

This project was initiated immediately following the unprecedented wildfire season of 2002 in the Rocky Mountain Region. It was designed to answer forest management questions related to the rate and type of deterioration of fire-killed trees among several forest cover types. Beginning in 2006, the project was funded as an Evaluation Monitoring (Fire) project.

Methods

The study included 29 plot locations among nine different wildfires that occurred in 2002. Plots were located on seven National Forests (in Colorado, Wyoming and South Dakota) and represented five different tree species (Engelmann spruce, subalpine fir, ponderosa pine, lodgepole pine and Douglas-fir). At plot establishment, sample trees were identified for the life of the study and burn severity determinations were made. Annually, individual trees were cut and scaled for volume. In addition, for each merchantable log, segments were collected and weighed for future weight factor determinations. At each log cut, the activity of wood boring insects was documented, along with the presence and amount of decay and stain. In order to monitor changes in wood density, wood blocks were taken from each log cut. Volume and dry weight of blocks were determined during subsequent lab analyses.



Plots were located among wildfires that burned in Colorado, Wyoming and South Dakota in 2002.



Following log scaling, log segments were measured and weighed in the field for future weight factor determinations.



2002 Field Crew. "Neither snow, nor rain, nor heat, nor gloom of night stays these technicians...."



Sap rot in ponderosa pine, five years after fire, Black Hills NF.



Wood boring insects were common among all five tree species.

Beginning in 2003, emergence traps were deployed at each plot location to collect and identify wood-boring insects. In 2006, samples were collected for isolation and identification of wood decay fungi. The final round of field sampling was completed in the summer of 2007.



Wood block volume determinations conducted in the lab.

Preliminary Results

Insects and Disease

Density of holes from wood boring insects in all five tree species showed a generally increasing trend up to four years following wildfires. The decay fungus, *Coniophora puteana*, was identified most frequently among 328 isolations from fire-impacted trees.

Wood Merchantability

During the life of the study, the decrease in log weights varied between tree species, ranging from 29 to over 50 percent. Greatest percent of decrease in log weight was among ponderosa pine, Bucktail Fire, GMUG NF. Least percent of decrease in log weight was among Douglas-fir, Hayman Fire, Pike NF. As of 2007, remaining merchantability* was limited primarily to a few lodgepole pine logs.

*Merchantability in this study refers to the potential to produce lumber. Other potential biomass uses were not assessed.

Ongoing and Future Work

- Identification of wood boring insects
- Completion of data analysis
- Preparation of final report

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