Surface Erosion on a Clearcut in the Willamette National Forest

by

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Accelerated surface erosion on steep forested slopes of the Pacific Northwest can cause losses in site productivity and in water quality. Both factors are subject to Federal Laws mandating monitoring.

The study was conducted in the Western Cascades on the Blue River Ranger District, Willamette National Forest. The timber type was Douglas Fir. The research had two key objectives:

1. Development of an effective monitoring system.
2. Determination of rates of surface erosion after timber harvesting.

Twenty-four catchment boxes with suspended sediment collectors were installed, twenty boxes within a 9 ha clearcut and the remaining four in an adjacent forested area. The measured surface erosion rates were similar to those found in previous surface erosion studies in forested areas.

No measurable surface erosion occurred at the forest control plots. Rates of surface erosion in the clearcut increased after burning. Rates the second year after burning were the greatest; surface movement decreased the following year.

Mean values for the pretreatment year 1980 and for 1981 to 1983 were 0.03, 0.53, 0.80 and 0.27 T/ha/yr.

Statistically significant differences were difficult to find. Site variability and the limited number of plots both contributed to this. Slope was the most significant variable determining erosion rate.

Future monitoring needs should include better climatic data, vegetative recovery data and the spatial distribution of dead and living organic material. The factors of slope length, slope shape, organic material protecting the surface and aggregate stability need further investigation.

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