

Sediment Production from Unpaved Roads, OHV Trails, and Forest Thinning Operations in the Colorado Front Range

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Abstract. National forests throughout the western US have been mechanically thinning dense stands to reduce the risk of catastrophic wildfires. Since 2001 we have been monitoring the effects of mechanical thinning on sediment production in the Upper South Platte watershed, as this basin is both the primary source of Denver's water supply and an important coldwater fishery. We also have been investigating sediment production from forest roads, as unpaved roads are often the largest sediment source in forested watersheds and the increased traffic associated with thinning is hypothesized to increase road erosion rates. Over the past 5 years we have been using sediment fences to measure sediment production from 20 thinned ("treated") swales and 20 control swales, and from 21 unpaved road segments. In 2005 we also began measuring sediment production from Off Highway Vehicle (OHV) trails, as these may be another important sediment source.

The thinned swales have produced essentially no sediment, while summer rainstorms larger than 5 mm generally produce sediment from each road segment. Since 2001 the mean annual sediment production rate from unpaved roads has varied from 0.4 kg m⁻² to 6.7 kg m⁻², and this variation is largely due to differences in the amount and intensity of summer precipitation. From 5 August to 31 October 2005 the mean sediment production from 5 OHV segments was 3.3 kg m⁻², which is slightly more than the mean sediment production rate from unpaved roads over the same time period. These results show that forest thinning activities generally do not increase erosion rates, while both unpaved roads and OHV trails are very large and chronic sources of sediment.