

Soil Report

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Gulch Fire Road Treatment Monitoring Report 2009

Executive Summary - Soil Quality Standards and Soil Productivity

This report documents road treatment effectiveness monitoring for the Gulch Fire part of the Shasta-Trinity Burned Area Emergency Response (BAER) implementation effort for the fires of 2008. Road treatments consisted of: armored rolling-dips, cleaning and upsizing culverts, and rocked outlets applied on main roads that suffered moderate to high soil burn severity. Overall effectiveness after 1 year was good to excellent for all sites. Most brushy sites lacked adequate cover, were on south-facing slopes that had more overland flows but road work held up well. Timbered sites were on north and east-facing sites that had adequate cover that reduced overland flows and suffered very little road damage.



Moving gravel used to armor rolling dips

Creating rolling dips and capping with rock & gravel

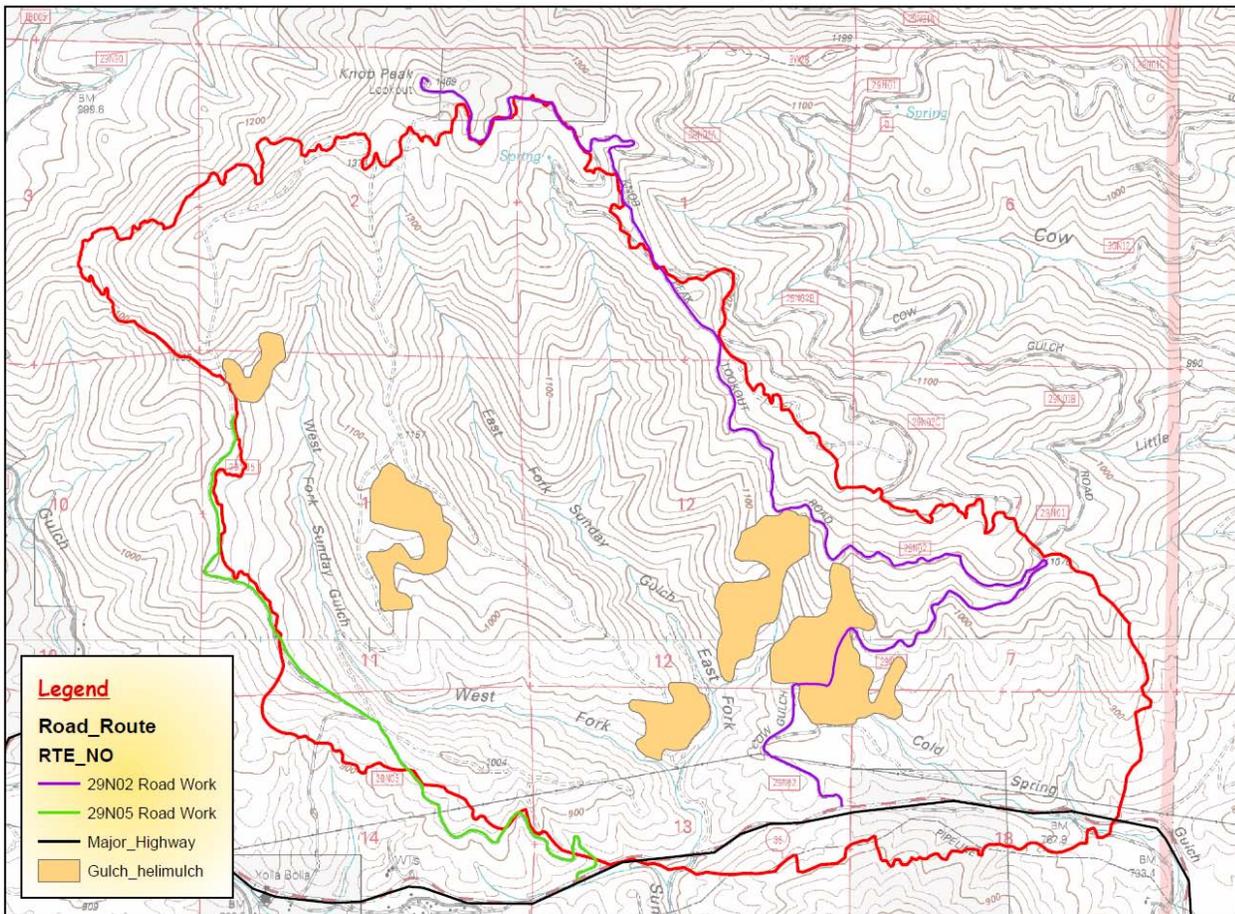
Forest Plan Standards: Implement forest soil quality standards as they relate to soil productivity and soil erosion. (Ref: Forest Plan 4-25e. Forest Soil Quality Standards, in relation to soil erosion).

Objectives: On September, 2008, a fast moving fire in dry brush and timber near Platina, CA on the Shasta-Trinity National Forest burned 2,847 acres. This fire burned hot and lacked adequate cover for erosion control to protect critical downstream resources (roads, watersheds, and fish habitat). Treatment objectives were to prevent road erosion by installing armored rolling-dips, cleaning and upsizing culverts, and rocking outlets. Monitoring was conducted over a period of one year to evaluate the effectiveness of various road treatments.

Methods: Representative road were driven and pictures were taken of before and after treatments along with terrain data (hillslope cover, aspect, slope, soil type, soil map unit, and dominate overstory vegetation) to evaluate treatment effectiveness after one year (see treatment map, Figure 1 below).

Figure 1: Gulch Fire of 2008 Treatment Locations (except helimulching units)

Gulch Fire Treatments



Results: On the average for areas that were timbered with low to moderate soil burn severity road treatments were highly effective (29N05 see Table 1 below). In areas with timber/brush cover that was burned moderate to hot (29N02), road treatments were still highly effective due to excellent construction (see Figures 2 and 3 below). With areas that had dominate brush (29N02, s-facing steep slopes) and high soil burn severity, road treatments were moderately effective due to increased overland flows eroding road prism.

High burn severity areas in brush had erosional pavement between bushes where fine soil was washed away leaving rock fragments as cover. Erosion recovery in these areas expected to recovery in the next 5 years vs. timbered areas in 1 to 2 years.

Table 1: Road Repair Effectiveness per Road, Terrain, Burn Severity and Treatment.

Gulch Fire Road Treatment Effectiveness:				
Road	Terrain	Burn Severity	Treatment	Effectiveness
29N02	SW-facing, 15-45% slopes, Holand and Neuns loam, timber/brush	Mod - high	Rolling-dips, culvert upsize, rockd outlets	High
29N05	S-facing, 35-60% slopes, Holland and Goulding loams, timber/brush	Mod	Rolling-dips, culvert cleanout, rockd outlets	High - Mod - Mod

Recommendations: Well done project with excellent construction but was late in implementation due to slow process of contracting. For BAER work that needs timely implementation force account work is preferred since they are done quickly with forest crews and with less cost.

Figure 2: Road Repair on 29N02 of rolling-dips, culvert replacements, and rocked outlets.



Figure 3: Road Repair on 29N05 of rolling-dips, culvert replacements, and rocked outlets.



Public Involvement: occurs during the NEPA process for identified projects.

Where is data located: Physical Science Dept., Shasta-Trinity National Forest Headquarters, Redding, CA.