Change in Rill Connectivity in Response to Salvage Logging on Burned Hillslopes in Central California

Will Olsen, Joe Wagenbrenner (SFRES), Pete Robichaud, Bob Brown (FS, RMRS)

Project Background

Logging on burned hillslopes is not well understood. It is also unclear what impact mechanical disturbance may have on rill networks.

Objectives

• Assess the relationship between rill networks, disturbance amount, and sediment yield.
• Assess changes in rill density following mechanical disturbance from post-fire logging relative to burned and unlogged hillslopes.
• Evaluate post-fire rill networks and sediment yields on burned and unlogged hillslopes.
• Assess the relationship between rill networks, disturbance amount, and sediment yield.

Preliminary Results

The logged swales ranged from 2.34 to 5.71 Mg ha⁻¹. Control swales varied from 0.00 to 0.08 Mg ha⁻¹. ASW7 was burned only. ASW1, 3, 4, 5, 6 were burned & logged. The burned only swale (ASW3) was less than half that of ASW5. We believe this could be due to different precision levels in the surveys. ASW3 was burned only. ASW2 & ASW6 were not re-surveyed. Rills were observed flowing in many pass trails & being diverted out of tracks by water bars. The increased rill density & sediment yields with many pass disturbance is likely due to increased many pass rill density. This is likely due to different planting strategies, fire effects, & rainfall events.

Discussion & Next Steps

Mechanical disturbance from post-fire logging can disturb large areas. The logged swales were affected spatially by many pass disturbance & were affected greater than half that of ASW5. We believe this could be due to increased sediment yields by 5-50%. Despite similar skidder impacts, the sediment yield in ASW3 was less than half that of ASW5. Post-salvage disturbance & rills (Feb 2015) in ASW5 & ASW7 were burned only. ASW1, 3, 4, 5, 6 were burned & logged. We believe this could be due to increased sediment yields by 5-50%.