

Project Number: EMC-2016-001  
Project Name: Post-fire 2013 Road Rules Effectiveness Monitoring in a Post-Fire Environment

**Background and Justification:**

14 CCR § 923 *et seq.* [943 *et seq.* 963 *et seq.*] of the California Forest Practice Rules comprise the 2013 Road Rules, implemented on January 1, 2015, that emphasize logging roads are to be designed, constructed, and maintained to minimize road-related impacts. To meet these objectives, the 2013 Road Rules incorporated new requirements that, among others, require logging roads throughout California to be hydrologically disconnected from watercourses; drainage facilities and structures adequately sized and properly spaced to avoid direct discharge of road runoff into watercourses; watercourse crossings designed and constructed to minimize diversion potential, as well as pass 100 year flood flows and debris; and road systems inventoried, with areas of significant existing or potential erosion identified and addressed.

Large-scale wildfires can impact slope hydrology through decreases in canopy interception and flow attenuation, particularly in areas with high soil burn severity. Decreases in infiltration result from collapsed soil structure and reduced soil porosity, hydrophobicity, ash residues that clog soil pores, and decreased ground cover that exposes soil (allowing for sediment to be entrained by raindrop impact). These processes reduce surface roughness, and allow runoff to move more rapidly downslope, resulting in an increased connectivity between burned hillslopes and adjacent roads, crossings, and watercourses. Consequently, roads and associated drainage structures/facilities within areas impacted by wildfire often must accommodate increased flows to avoid catastrophic failure, significant erosion, significant discharge of road sediment, and associated downstream impacts.

The Valley Fire in Lake County California burned 76,067 acres in September 2015, and included 99% of the 3,493 acre Boggs Mountain Demonstration State Forest (BMDSF). The BMDSF contains approximately 28 miles of mostly native-surfaced roads. Several emergency notices have been filed and the majority of BMDSF will soon be salvage logged.

To date, the requirements of the 2013 Road Rules and their effectiveness to minimize road-related impacts, particularly in areas that have been altered by the effects of wildfire, have not been investigated. Aside from the 2013 Road Rules, very few studies of post-fire effects on roads and crossings have been conducted in California.

**Objective(s) and Scope:**

The primary objective of this study is to test the effectiveness of the 2013 Road Rules in a post-fire salvage logging environment. The overarching monitoring question is: Are the 2013 Road Rules effective in reducing road-related impacts in a post-fire setting?

This governing monitoring question leads to several sub-questions that include, but are not limited to:

- Are the Road Rules effective in hydrologically disconnecting the road network from watercourses in a post-fire environment?

- Are the Road Rules effective in preventing significant sediment discharges from the road network to watercourses in a post-fire environment?
- Are the Road Rule requirements for watercourse crossings in a post-fire environment sufficient to produce structures able to handle increased winter storm runoff and debris (sediment and wood) loads?

Answering these questions will require us to focus on the interdisciplinary process within the Road Rules that focuses on hazard identification (i.e., potential for erosion and runoff generation) and risk determination (i.e., linkage to beneficial uses), as well as prescriptive elements of the Road Rules package. Specific details will be addressed in a more detailed concept proposal.

**Rule or Regulation:**

14 CCR § 923 *et seq.* [943 *et seq.* 963 *et seq.*]

**EMC Critical Question or Priority:**

See Section 2.3, Themes 1, 2, 3, and 4

**Collaborators:**

CAL FIRE, CGS, CVRWQCB, CDFW, Oregon State University

**Existing or Needed Funding:**

No additional funding required. It is anticipated that collaborators will provide the majority of the staff and resources to collect necessary data and perform necessary reporting.

**Timeline and Fiscal year(s):**

Field surveys would be conducted over the next 4 years. Data generated from the field surveys would be compiled, assessed, and results presented in a summary report presented to the Board of Forestry and Fire Protection in 2021. Interim progress reports will be made available as well.

**Principal Investigator or Contact:**

Don Lindsay, CGS

*Submitted by CGS*