Project Number: EMC-2017-xxx
Project Name: Intensive Road Effectiveness Monitoring for the Caspar Creek Third Experiment

---

Background and Justification:

This project proposes to conduct intensive field monitoring to rigorously quantify sediment discharge from a range of hydrologically connected road segments that have been treated to minimize "significant sediment discharge." Sediment discharge and flow from treated connected road segments (i.e., the remaining portion of the road network that could not be fully disconnected but have been treated for erosion control) will be measured. Frequent sampling over time and space will provide data on "significant sediment discharges," as defined by the Forest Practice Rules.

We propose to conduct this research-level monitoring study in South Fork Caspar Creek as part of the Third Experiment. Using a nested sampling approach in this heavily instrumented watershed will provide a link between discharge and sediment concentration from road segments (i.e., the road sediment signal) and water quality conditions in the downstream direction. The nested biological portion of the third experiment (i.e., BMI and fish monitoring) can inform us about possible beneficial use impairment, allowing us the potential to explicitly link road performance to water quality requirements. Additionally, the road erosion field data will be coupled with DHSVM modeling already funded for the Third Experiment. This study will support DHSVM simulations and improve model performance. DHSVM modeling combined with road storm sediment relationships will quantify surface erosion at road discharge points.

This project will complement EMC-2015-004 (Road Rules--Effectiveness of reducing hydrologic disconnection and road surface erosion), which is a broad, regional scale assessment of road hydrologic connectivity and erosion potential before-and-after road rule implementation to assess the effectiveness in achieving rule-mandated hydrologic disconnection and reduction of significant sediment discharges. Combined, these two projects provide a strategy to evaluate road performance on non-federal forestlands regulated by the California Forest Practice Act and Rules. This new process-based evaluation of the effectiveness of the Road Rules is vital for fully assessing the overall performance of the California Forest Practice Rules.

A pilot project is proposed for the winter of 2017/18 to define a more precise methodology. The options for road sediment data collection include (1) grab samples at outlet of road flumes, (2) grab samples above and below watercourse crossings, (3) utilizing a catchment device in conjunction with the road flume (e.g. silt fence, silt sock, other), or (4) pumping sampler at a flume. The selected method(s) will be implemented more broadly during the winter of 2018/19 in the South Fork.

Objective(s) and Scope:

The objectives of the Intensive Road Effectiveness Monitoring Project are to determine the effectiveness of the road-related Forest Practice Rules in preventing significant sediment discharges that adversely impact water quality. The scope of this monitoring applies to all Forest Practice Districts.

FPRs and regulations: 14 CCR § 923 (943, 963), TRA#5

EMC Critical Question or Priority: See Section 2.3, Theme 3
Specifically, are the FPRs and associated regulations effective in:
(a) reducing or minimizing management-related generation of sediment and delivery to watercourse channels.
(b) reducing generation and sediment delivery to watercourse channels when timber operations implement the Road Rules 2013 measures.

Collaborators: Cal Poly State University, San Luis Obispo; CAL FIRE; US Forest Service Pacific Southwest Research Station

Existing or Needed Funding: EMC funding is requested for field equipment. Funding for temporary winter field assistance may be required. The DHSVM (Evaluation of Hydrologic and Water Quality Changes Associated with Differing Silvicultural Treatments, Road Practices, and Riparian Buffer Strip Design Implemented under the California Forest Practice Rules using the Distributed Hydrology Soil Vegetation Model (DHSVM) at the Caspar Creek Experimental Watersheds) contract with Cal Poly State University has been previously funded by CAL FIRE for years 2017/18 and 2018/19.

Timeline and Fiscal year (s):

Estimated minimum of 2 years. Amount TBD.

Submitted by Drew Coe and Pete Cafferata, 05/17/17