

Board of Forestry and Fire Protection
Monitoring Study Group Meeting

May 18, 2016

South Lake County Fire Protection District Station
Middletown
and
Boggs Mountain Demonstration State Forest
Cobb

Agenda

- 1. Lake Tahoe Basin Fuels Treatment Study**
- 2. Brief Updates on MSG Cooperative Instream Monitoring Projects**
- 3. Brief Updates on BOF EMC and AB 1492 Efforts**
- 4. Field Presentation on the Post-Fire Erosion Studies Underway at BMDSF**

41 people in attendance

Finding balance between fire hazard reduction and erosion control in the Lake Tahoe Basin, California-Nevada

keep_tahoe_blue

Nicolas M. Harrison

Lead Hydrologist
Humboldt Redwood Company

Monitoring Study Group Meeting May 18, 2016

Reduce fuel loading in order to decrease the potential for catastrophic wildfires

wildfire

Photo: healthyforests.org



Prescribed fire: broadcast burns

presribed_fire_EK



Photo: E. Knapp

nps.gov

Mechanical mastication

P1100145



Study Goals and Objectives

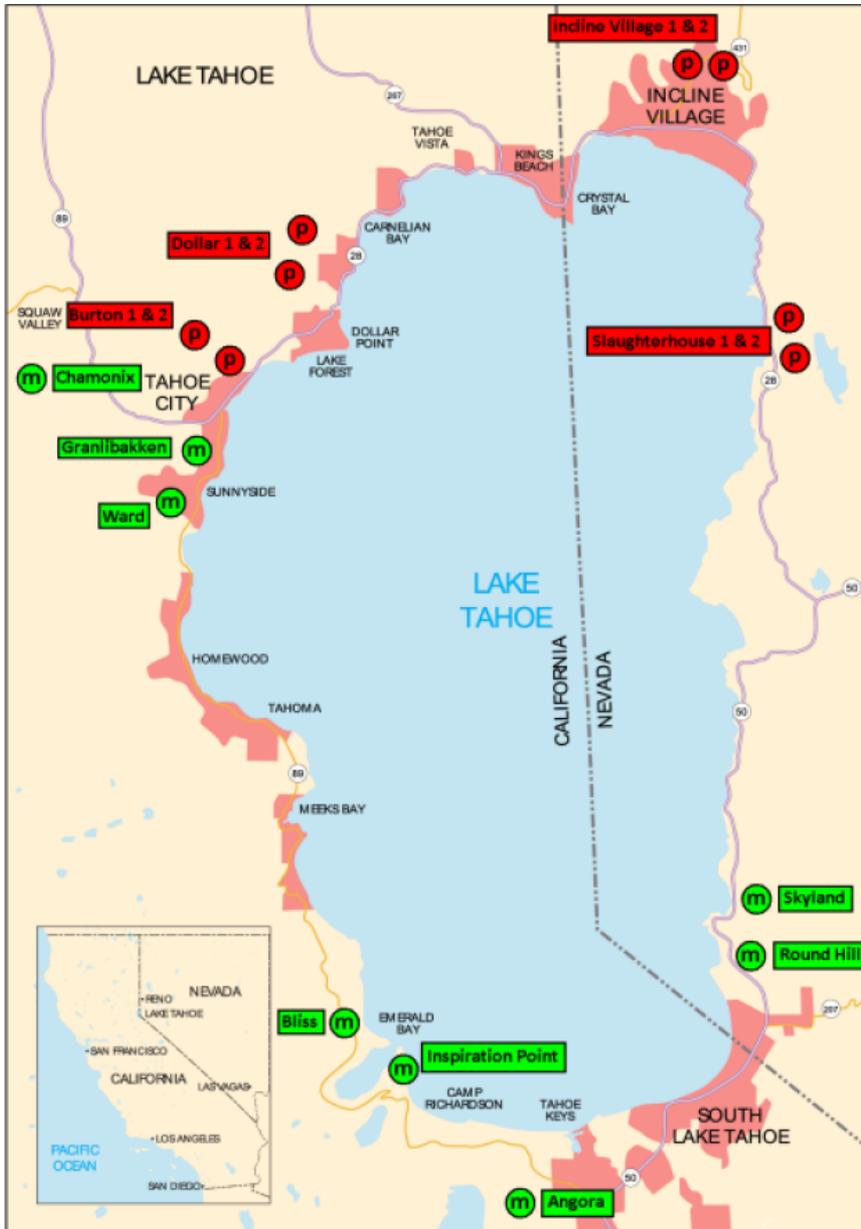
- **Study Objective:**
Quantify tradeoffs between fuel reduction and erosion
- **Critical Question:** What are optimal levels of surface fuel retention for mechanical mastication and prescribed fire treatments?



Experimental Design

Snowmelt runoff simulation

- 8 masticated sites (2009)
- 8 prescribed fire sites (2010)
- Slopes: 15-38%
- Soil types: Granitic (n = 7)
Volcanic (n = 9)



50% Patchy Retention

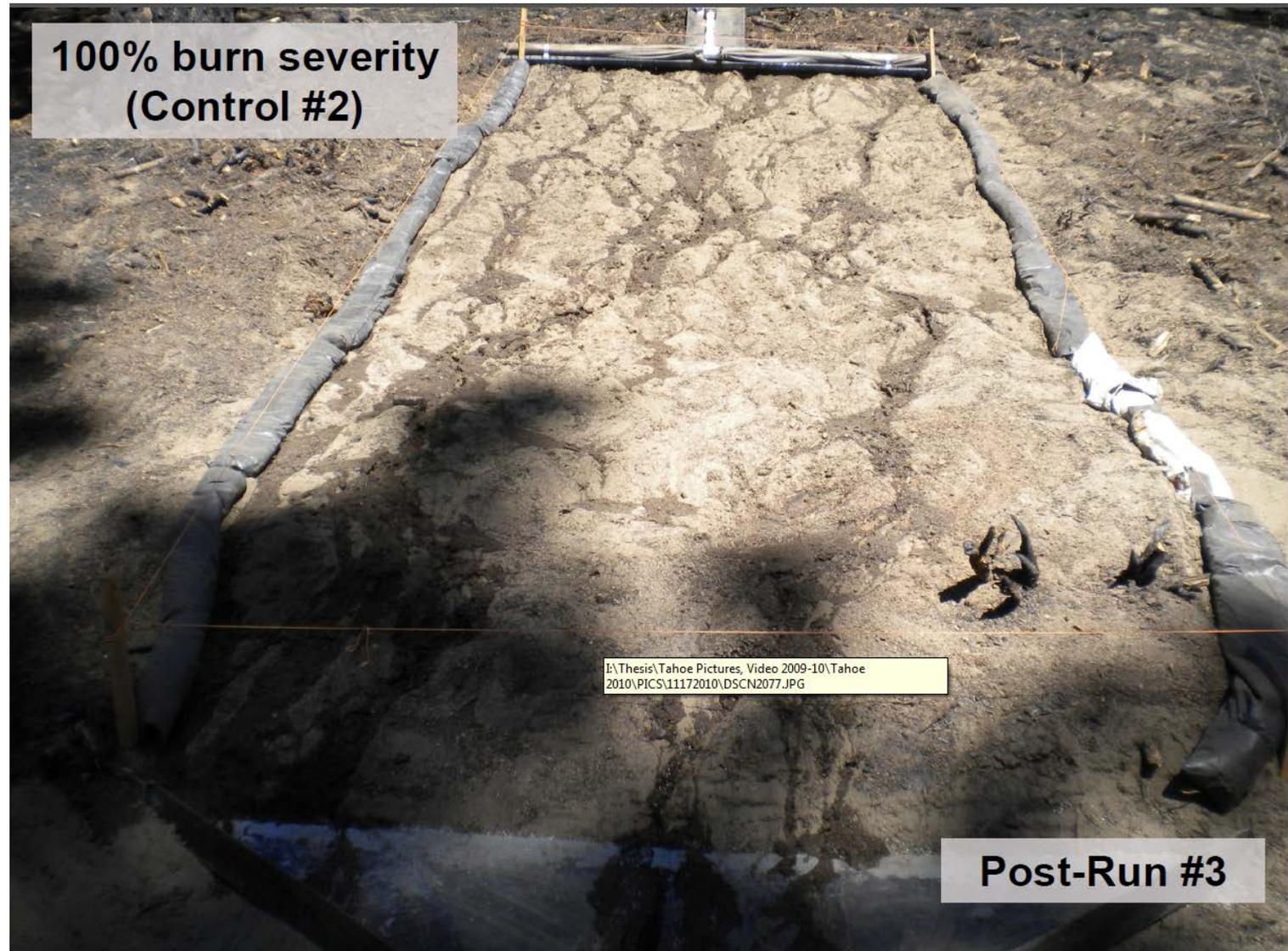


Retention rates of 0%, 25%, 50%, 75%, and 100%

**50% Even fuel
redistribution**



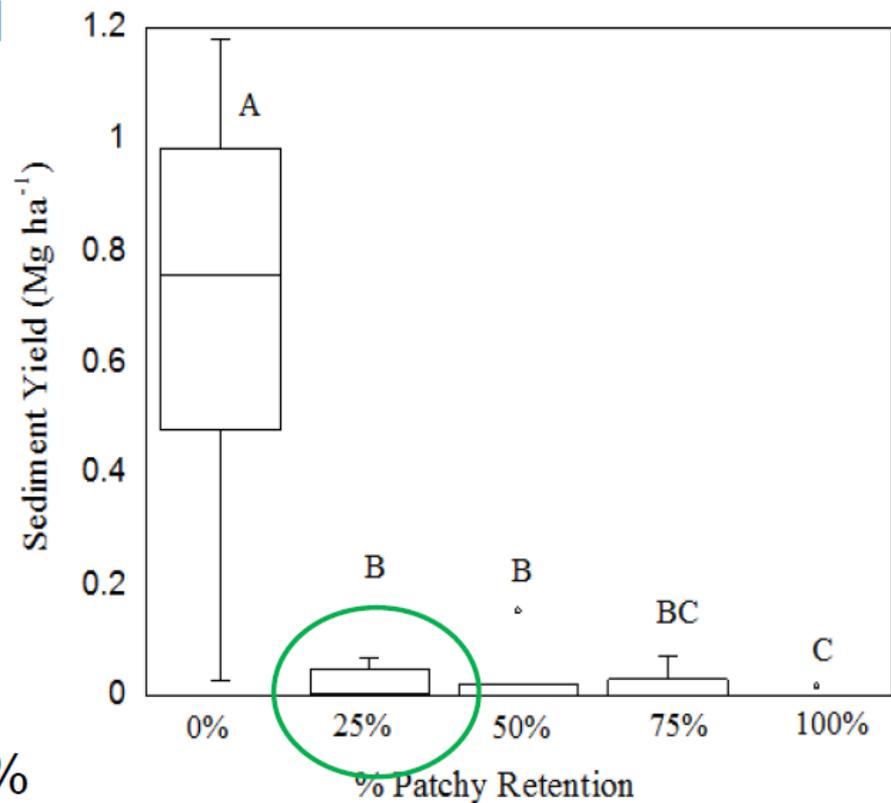
Retention rates of 25%, 50%, 75%, and 100%



Consumption of ~ 0-25%, 25-50%, 50-75%, and 75-100% of surface fuels and duff

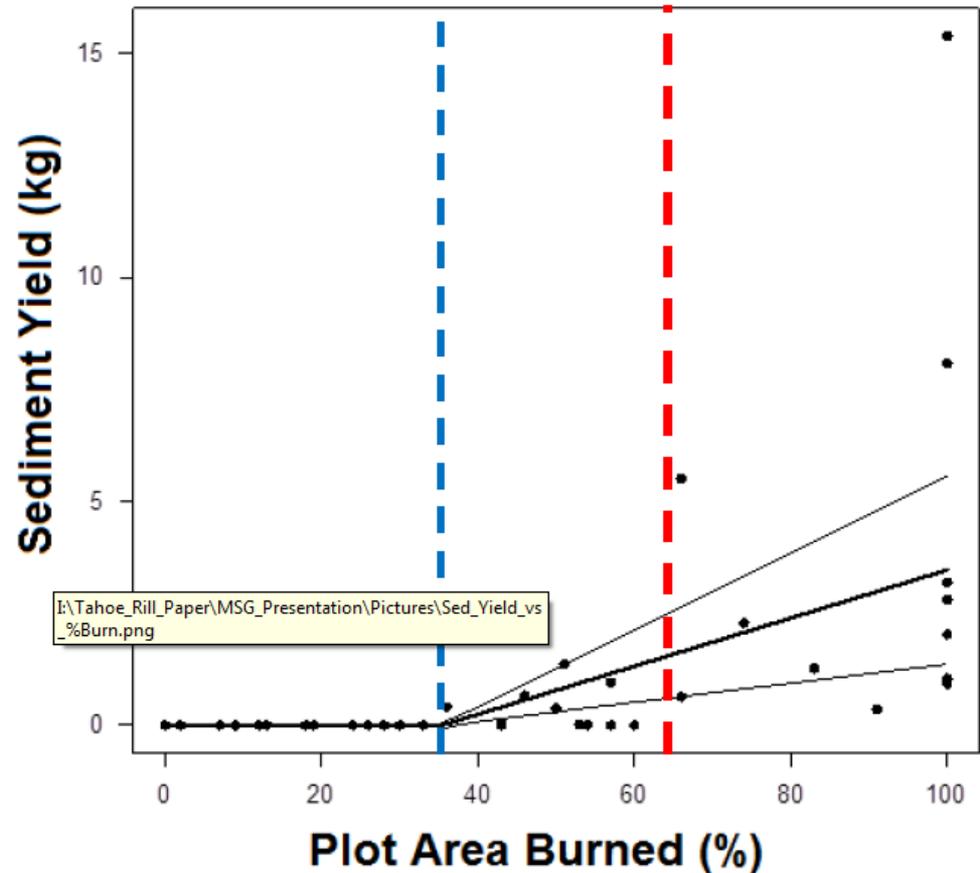
Results: Masticated Sites: Patchy Retention Treatments

- Bare soil exposure resulted in highest avg. sediment yields
- Similar sediment yields in 25% and 50% treatments but both were 97% lower relative to 0% treatments
- No significant difference between sediment yields measured in 75% and 100% treatments



Results: Prescribed Fire Sites

- Minimal to no sediment yields at < 35% burn severity
- Variable sediment yields at 35% - 66% burn severity
- High sediment yields at >65% burn severity



Conclusion

- Erosion and wildfire severity can be simultaneously mitigated through the use of:
 - Masticated fuel reduction treatments or prescribed fire treatments that leave sufficient organic matter to trap sediment, and
 - Have sufficiently low fuel loading and/or enough fuel discontinuity or patchiness to limit fire spread.



MSG Cooperative Instream Monitoring Projects

- **Caspar Creek** Watershed Study—Dr. Salli Dymond, USFS PSW
- **Little Creek** (Swanton Pacific Ranch)—Dr. Brian Dietterick, Cal Poly State University
- **Railroad Gulch** BMP Evaluation Study Update—Nick Harrison, HRC
- **South Fork Wages Creek** Cooperative Instream Monitoring Project—Pete Cafferata, CAL FIRE
- **Little River** (Humboldt County)—Dr. Lee MacDonald, CSU, and Matt House, GDRCo
- **Judd Creek** Cooperative Instream Monitoring Project—Dr. Cajun James, SPI

Post-Fire Erosion Studies at BMDSF









Post-Fire Erosion Studies at BMDSF

Drew Coe, Don Lindsay, Dr. Joe Wagenbrenner

3 Main Study Components

- **Catchment Study (6 swales ranging from 0.4 to 1.6 ac)**
 - quantify the effects of different soil burn severities on catchment scale runoff rates, sediment delivery, etc.
- **Post-Fire Forest Management Study**
 - 5 treatments and controls replicated in 5 blocks
- **Post-Fire Demonstration Study**
 - demonstrate alternative BMPs for post-fire salvage operations





Post-Fire Erosion Studies at BMDSF

Plot-Scale Experiment Treatments

- Salvage logged with ground-based methods following practices in larger sale units (i.e., logged only).
- Logged and contour subsoiled (ripped).
- Logged and pre-emergent herbicide site preparation.
- Logged and delayed application of defoliant herbicide site preparation.
- Logged, ripped, and pre-emergent herbicide (space dependent).

Control Plot 15 m x 5 m









Post-Fire Erosion Studies at BMDSF

- Funding for this study is being pursued through the State Water Resources Control Board's 319(h) non-point source funding program.
- EMC Project No. 2016-002.
- Project Description:
http://www.bof.fire.ca.gov/board_committees/effectiveness_monitoring_committee/pdfs/emc_5.1_draft_concept_proposal_emc-2016-002_04_14_16.pdf