

Monitoring Study Group Meeting Minutes

May 18, 2016

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

The following people attended the MSG meeting (41):

Mike Miles (BOF), David Fowler (NCRWQCB), Richard Gienger (RFFI/Forests Forever+), René Leclerc (CVRWQCB), Ryan Bey (NCRWQCB), George Gentry (CFA), Mandy Culpepper (DFW), Angela Moran (DFW), Drew Coe (CAL FIRE), Jacob Lee (CGS), Dennis Hall (CAL FIRE), Tim Walcott (NCRWQCB), Matt House (GDRCo), Daniel Whitley (CVRWQCB), Robynn Swan (CDFW), Tal Robinson (CVRWQCB), Nick Harrison (HRC), Cherie Blatt (NCRWQCB), Cedric Twight (SPI), Julie Bawcom (CGS retired), Maggie Robinson (NCRWQCB), Dr. Matt O'Connor (OEI), Carley Dunleavy (NCRWQCB), James Robbins (CAL FIRE), Ronna Bowers (CVRWQCB), Bill Short (CGS), Jeff Webster (Jefferson Resource Co.), Ed Fredrickson (Thunder Road Resources), Kelly Larvie (CAL FIRE-FRAP), Spenor Shadle (New Island Capital), Dave Longstreth (CGS), Jonathan Warmerdam (NCRWQCB), Dr. Joe Wagenbrenner (MTU), Colby Forrester (CAL FIRE), Craig Pedersen (CAL FIRE), Dave Loveless (CAL FIRE), Drew Loganbill (NRCS), Cheryl Hayhurst (CGS), Kenneth Spacek (Gualala River Watershed), Connor Pompa (CAL FIRE), and Pete Cafferata (CAL FIRE).

Webinar participants were not recorded.

[Action items are shown in bold print]

1. Monitoring-Related Announcements

- California Forest Soils Council—June 17-19, 2016; Summer Field Tour, Southern Humboldt County. See: <http://www.caforestsoils.org/>
- The Coast Redwood Forest Symposium will take place on September 13-15, 2016 in Eureka (see: <http://ucanr.edu/sites/Redwood2016/>).
- California Licensed Foresters Association (CLFA)--October 7—Fall Field Day Inland—Post-Fire Regeneration, Location TBD (<http://www.clfa.org/>).
- The 19th Annual Coho Confab is scheduled for August 26-28th in Caspar (Jughandle Creek Farm). For more information, see: <http://www.calsalmon.org/programs/coho-confabs/19th-annual-coho-confab>
- NorCal/SoCal Society of American Foresters (SAF) Summer Meeting - August 25-26, 2016. A Centennial Celebration—Professional Forestry in California. Oakhurst and Bass Lake area.

2. Lake Tahoe Basin Fuels Treatment Study

Nick Harrison, Humboldt Redwood Company Lead Hydrologist, provided a PowerPoint presentation titled "Finding Balance Between Fire Hazard Reduction and Erosion Control in the Lake Tahoe Basin, California-Nevada." This study was conducted for his M.S. degree at

Humboldt State University, studying under Dr. Andy Stubblefield (see: http://www.fs.fed.us/psw/partnerships/tahoescience/documents/p019_HarrisonThesis.pdf). The PowerPoint is posted on the Monitoring Study Group website at: http://www.bof.fire.ca.gov/board_committees/monitoring_study_group/may_2016/may_18th_nic_k_harrison_tahoe_msg_presentation.pdf.

Mr. Harrison began his talk by providing background information, including how reducing fuel loading in the Tahoe Basin became a higher priority after the catastrophic 2007 Angora Fire. The two main approaches used for fuel reduction are mechanical mastication and prescribed fire (broadcast burn or pile burns). The potential problem is that these treatments can remove forest floor ground cover, potentially increasing erosion rates into Lake Tahoe. Study objectives included (1) quantifying tradeoffs between fuel reduction and erosion, and (2) determining optimal levels of surface fuel retention for mastication and prescribed fire treatments. Eight masticated sites were studied in 2009 and eight prescribed fire sites were evaluated in 2010. Seven sites had granitic soils and nine had volcanic soil types. Snowmelt runoff was simulated using a runoff simulator (15 L/m of water for 3 successive 12 min runs on 5 m x 2 m plots).

Masticated sites had nine plots per site established. There were five plots with “patchy retention” treatments and four plots with “even retention” treatments, along with two control plots. Patchy retention treatments had retention rates of 0%, 25%, 50%, 75%, and 100%. Even retention treatments had retention rates of 25%, 50%, 75%, and 100%. Prescribed fire sites had six plots per site, which included two control plots. The remaining four plots were placed in areas where the fire had consumed approximately 0-25%, 25-50%, 50-75%, and 75-100% of surface fuels and duff, depending on site-specific conditions. Soils were sampled for bulk density, hydraulic conductivity, and volumetric water content prior to runoff simulation. Runoff samples were processed in the laboratory for TSS (mg/L) and total sediment yield (kg).

Results for the masticated sites showed that sediment yields were greatest in treatments characterized by complete soil exposure and lowest for treatments with complete surface fuel retention. Sites with patchy retention treatments had significantly lower sediment yields than those with even fuel treatments. For the patchy retention plots, bare soil exposure resulted in the highest average sediment yields. Similar sediment yields were found with the 25% and 50% treatments. There was no significant difference between sediment yields measured in the 75% and 100% treatments. For the even retention sites, 50%, 75%, and 100% treatment means were not significantly different. There was an 83% reduction in sediment yield from 25% to 50% treatments. On average, there were higher sediment yields on the volcanic soil types.

For the prescribed fire sites, sediment yields increased with increasing burn severity. There was a strong increase in sediment yield at burn severity greater than 35%. The highest sediment yields occurred in the 66% to 100% range. Plot area burned was a significant predictor of sediment yield. Overall, there was variable sediment production at 35-66% burn severity, and high yields at >65% severity. The two sites with decomposed granitic soils produced the highest sediment yields.

The results from this study are consistent with earlier research conducted in the Tahoe Basin and elsewhere (Hatchett et al. 2006, Grismer et al. 2008, Larsen et al. 2009, etc.). Summary conclusions presented included (1) duff layers are important for mastication treatments, so maintain at least a minimal amount of undisturbed ground cover (reducing soil exposure from 100% to 75% = 97% reduction in erosion); and (2) for prescribed fire treatments, limit overall burn severity to a maximum of 65% to substantially reduce erosion potential. Overall, 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 but have sufficiently low fuel loading and/or enough fuel discontinuity or patchiness to limit fire spread. Several suggestions for continued research were provided. The published paper on this study is available from Mr. Harrison (nharrison@hrcllc.com).

3. Brief Updates on MSG Cooperative Instream Monitoring Projects

Pete Cafferata requested that the principle investigators for MSG cooperative instream monitoring projects submit short updates on their projects. The following was provided and handed out at this MSG meeting. These studies were briefly discussed.

Caspar Creek Watershed Study—Dr. Salli Dymond, USFS PSW

The Caspar Creek Third Experiment Study Plan was approved by the USFS PSW and CAL FIRE on February 17, 2016. The plan was written by Dr. Salli Dymond, USFS PSW post-doctoral Researcher. The overarching goal of the new study is to investigate the effects of stand density reduction on biological, physical, and chemical watershed processes in the South Fork of Caspar Creek. Planning for this experiment began in 2000, with gauges installed in 10 sub-watersheds in 2001, providing 15+ years of pre-treatment streamflow, turbidity, and suspended sediment data. Instead of installing an experiment that uses replicates, a range of treatments will be used, going from 25% reduction in stand density to a 75% reduction. Ten main sub-studies have begun, are in the process of beginning, or are in the process of being developed (http://www.bof.fire.ca.gov/board_committees/effectiveness_monitoring_committee/feb_2016/emc/emc_4.0_presentation_by_salli_dymond_casper_creek_02_24_16.pdf):

1. Watershed Resilience and Recovery Study—USFS PSW and CAL FIRE
2. Plant-Soil-Water Dynamics Study—USFS PSW (Dr. Salli Dymond) [document how forest stand density reduction influences hydrologic processes along hillslope transects]
3. Water Worlds Study—USFS PSW (Dr. Salli Dymond); OSU (Dr. Kevin Bladon); Univ. of Saskatchewan (Dr. Jeff McDonnell) [improved understanding of how timber harvesting influences the delivery of water from hillslopes to streams and water use of residual trees using stable isotopes]
4. Bioassessment Study—DFW (Jim Harrington and Dr. Pete Ode) [determine the effects of contemporary forest practices on macroinvertebrate assemblages and stream nutrients]
5. Distributed-Hydrology-Soil-Vegetation Model (DHSVM) Study—Cal Poly SLO (Dr. Chris Surfleet)
6. Sediment Fingerprinting Study—OSU (Dr. Jeff Hatten) [document the sources of stream channel sediments using fingerprinting techniques]
7. Fine Sediment Study—OSU (Dr. Ivan Arismendi) [contrast fine sediment data from the NF experiment with the 3rd Experiment using two novel statistical techniques]
8. Road Rehabilitation Study—USFS PSW (Liz Keppeler) [determine the erosional consequences of legacy road rehabilitation]
9. Effects of forest stand density reduction on nutrient cycling and nutrient transport—UC Davis (Drs. Randy Dahlgren and Helen Dahlke) [examine changes in major nutrients and cations/anions across watersheds, hillslopes, riparian zones, and streams]
10. Caspar Creek Landslide Mapping Study—CGS (Dave Longstreth) [using LiDAR and other modern georeferenced mapping techniques, CGS will map landslide geomorphology in both the SF and NF of Caspar Creek]

Timber harvesting in the instrumented sub-watersheds will occur in 2018; the matrix area outside of these watersheds will be cut in 2017. Some new road construction will be required

and will be done in conjunction with the harvesting. The matrix area will be harvested at approximately a 35% stand density reduction. The THP is under development.

Little Creek (Swanton Pacific Ranch)—Dr. Brian Dietterick, Cal Poly State University

A new experiment has been begun in the Little Creek watershed to analyze the spatio-temporal variability of instream community structure within and among varying habitat types along seven stream reaches in the Little Creek watershed. The goal is to develop an assessment method to estimate net ecological benefit of riparian treatments. The result will be a prediction of the ecological benefit that would be associated with implementing a riparian vegetative treatment in North Fork Little Creek watershed. A new CAL FIRE contract with Cal Poly has nearly been finalized to help fund this research.

Specifically, the seven representative study reaches established in Little Creek watershed will aid in understanding relationships between macroinvertebrate community structure and substrate, canopy composition and shading. Macroinvertebrate samples and physical habitat data are collected using the Reachwide Benthos (RWB) procedure described by SWAMP'S Bioassessment protocol. Individual macroinvertebrate specimens are being identified to the family level. Sampling events occur every Spring, Summer, and Fall. The Spring 2016 sampling event will take place June 4th - June 7th. Upcoming tasks include hiring lab assistants to process macroinvertebrate samples, meeting with Dr. John Walker of the Cal Poly Statistics Department to format the project's database, and participating in the poster session at the Society for Freshwater Sciences Annual Meeting in Sacramento.

Railroad Gulch BMP Evaluation Study Update—Nick Harrison, HRC

This study is designed to evaluate the effectiveness of Humboldt Redwood Company's HCP, the California Forest Practice Rules, and Elk River Watershed Analysis-derived prescriptions in minimizing sediment delivery to watercourses in response to timber harvest activities through the integration of compliance and effectiveness monitoring. A paired watershed format is being used to evaluate sediment loading from road surfaces, watercourse crossings, landslides, Class I channel incision and bank erosion, and tributary channel head-cutting. The study compares the West Branch (1.48 km², 365 ac) and the East Branch (1.28 km², 314 ac) of Railroad Gulch, a tributary to the Lower South Fork Elk River near Eureka. Forty-seven percent of the East Branch will be logged in the summer of 2016 with 80 acres of single tree selection, 45 acres of group selection, and 24 no-cut acres left as buffer strips along Class I and II watercourses. New seasonal road was constructed in the summer of 2015, and existing roadways reopened. No timber operations will occur within the West Branch, which will serve as the study control.

Data have been collected pertinent to the evaluations listed above since 2014 and data collection will continue through 2019. Starting in May and throughout the summer, road surveys, hillslope and in-stream landslide inventories, cross-sectional surveys, pebble counts, and channel head inspections will be conducted. Analysis is currently underway on data collected during WY 2016. A progress report dated May 10, 2016 covers study objectives, design, and preliminary results from water years 2014 and 2015 (see: http://www.bof.fire.ca.gov/board_committees/effectiveness_monitoring_committee/may_2016_emc/emc_3.0_annual_report_2014-2015_bmp_effectiveness_rr_gulch.pdf). **Future reports will be submitted annually and will cover results from the previous water year.** Dr. Andrew Stubblefield (HSU), PI, provided a presentation on the study at the BOF EMC meeting held on May 16th in Redding, and he will provide a paper on the project at the Coast Redwood Forest Symposium in September (see: http://www.bof.fire.ca.gov/board_committees/effectiveness_monitoring_committee/may_2016

[emc/emc 3.1 railroad gulch presentation stubblefield.pdf](#)). CAL FIRE is helping fund this study through a contract with Dr. Stubblefield and HSU.

South Fork Wages Creek Cooperative Instream Monitoring Project—Pete Cafferata, CAL FIRE

Background data have been collected for water years 2005 through 2015 in the South Fork Wages Creek, with annual data summaries produced. Due to timber stand age and other factors, the project has not yet had a THP implemented to test the effectiveness of the Forest Practice Rules. In January 2015, Hawthorne Timber Company lands in western Mendocino County, including the South Fork Wages Creek watershed, were sold to Lyme Redwood Forest Company, LLC. Lyme Redwood determined that they would no longer be able to fully fund and complete this THP effectiveness scale monitoring project as originally structured due to their limited funding available for research. CAL FIRE has developed a sole source contract with Lyme Redwood to continue the project and fund the study for data collection through 2020; it is currently in the contract review process.

The overall objective of this monitoring project is to evaluate the relative importance of sediment generated by THP activities, compared to legacy sources and background rates within the South Fork Wages Creek watershed. A before and after control study has been designed and implemented. Turbidity and streamflow monitoring stations have been established at three locations in the watershed. A THP to implement an updated road system in the South Fork Wages Creek watershed was completed in 2014, followed by one over winter period for data collection to document sediment from roads versus timber harvesting.

Due to the ownership change, no monitoring took place in water year 2016 (winter of 2015-2016). This contract, if approved, will enable monitoring to take place in water years 2017 (beginning in October 2016) through water year 2020 (June 2020). A THP will be submitted in 2016 and harvesting will occur during the summer of 2017, ensuring that there will be three years of post-treatment monitoring data collected. The THP will propose logging in the non-control watershed area of the South Fork of Wages Creek. After harvesting is conducted in 2017, suspended sediment and turbidity data will allow conclusions to be drawn regarding the effectiveness of current management practices implemented as part of California's Forest Practice Rules in protecting water quality.

Little River (Humboldt County)—Dr. Lee MacDonald, CSU, and Matt House, GDRCo

Dr. Lee MacDonald, Colorado State University, has undertaken a project with Green Diamond Resource Company (GDRCo) titled "Quantifying Cumulative Watershed Effects Over Time in Two Little River Watersheds, Humboldt County, Northwestern California." The overall goal of the study is to qualitatively and, to the extent possible, quantitatively characterize the relative magnitude and effects of natural and management-related sediment inputs over three different time scales for two ~3,700 acre (15 km²) sub-watersheds in the 26,000 acre (105 km²) Little River drainage located north of Arcata. These two watersheds have been selected in part because (1) they are 100% owned by GDRCo; (2) timber harvest records date back to the early 1900s and aerial photos to the early 1940s; (3) a USGS gaging station has operated at the mouth of the Little River watershed since October 1955; (4) they have had relatively high harvest rates by cable and ground-based clearcuts over the last 15-20 years; (5) they have at least ten years of stream gaging, aquatic habitat, and fisheries data; and (6) their comparatively small size will allow a relatively comprehensive aerial photo and sediment source analysis. To assess the relative impact of natural, legacy, and current sediment sources we are assessing sediment inputs over three time scales: the millennial time scale using 10Beryllium (¹⁰Be); the 100+ year time scale using timber harvest records and aerial photos; and the 10-20 year time scale using process-based sediment source studies and the gaging station data.

In terms of work accomplished and planned, ¹⁰Be samples were collected at the watershed and sub-watershed scale in May 2015, and the results are expected over the next few months. The historic timber harvest maps have been digitized, and the LiDAR data for the watersheds have been used to delineate the railroad network used for the early logging. The aerial photos also have been analyzed to provide a nearly complete record of timber harvest over time, and the next step is to quantify the skid trail densities from representative harvest units over the different logging cycles. The aerial photos also will be used to identify the number, size, and likely cause of landslides over time, and these data will be combined with the existing landslide inventory to estimate landslide volumes and delivery. A road inventory has been conducted to quantify current road-stream connectivity, and these values will be compared to previous inventories to estimate the changes in road sediment production and delivery over time. Most of the gaging station, aquatic habitat, and fisheries data are already compiled. Deep-seated earthflows are not common, so it should be relatively straightforward to map these from the LiDAR data and then try and estimate the volume being delivered by a combination of remote sensing and field measurements. Streambank landslides have been inventoried, but streambank erosion surveys have not yet been conducted.

The expectation is that most of the historic data should be available by late summer 2016. Once all the historic data have been compiled, we can then begin the process of estimating relative sediment inputs over time from each of the major natural and management-related sources (deep-seated earthflows, soil creep, streambank erosion, railroads, roads, harvest units, and landslides). Data analysis will extend through summer 2017, and the results should be written up for publication in late 2017. We expect that the data compiled for these two watersheds can be extrapolated in a relative sense to other watersheds to provide a more rapid index of legacy effects over time, and possibly in an absolute sense to geologically-similar watersheds. CAL FIRE is helping fund this study.

Judd Creek Cooperative Instream Monitoring Project—Dr. Cajun James, SPI

All field work and data analysis for the first phase of the Judd Creek Watershed Study has been completed. Ten years of water quality data collection, sediment budget, and particulate organic matter (POM) work have been completed. Continuous monitoring is ongoing in Judd Creek.

A final report and peer reviewed paper will be finished in the latter part of 2016. The Judd Creek data will be included with data from eight other watersheds where sediment budgets, turbidity monitoring, and POM analysis have been completed. All of these watersheds had active timber operations occur over the last two decades. Results of this work show water quality conditions over the last two decades where logging has occurred under the California Forest Practice Rules.

4. Brief Updates on BOF EMC and AB 1492 Efforts

Brief update on the Board's Effectiveness Monitoring Committee (EMC)

- The EMC is meeting approximately every one to two months. The last meeting was May 16th.
- The EMC website has meeting announcements, project proposals, etc.: http://bofdata.fire.ca.gov/board_committees/effectiveness_monitoring_committee/
- The EMC Strategic Plan was approved by the BOF in October 2015.
- 10 critical monitoring question "themes" are identified in the Strategic Plan: WLPZ riparian function, watercourse channel sediment, road and WLPZ sediment, mass wasting sediment, fish habitat, wildfire hazard, wildlife habitat: species and nest sites,

wildlife habitat: seral stages, wildlife habitat: cumulative impacts, and wildlife habitat: structures. Each critical question theme has associated critical questions.

- 11 EMC monitoring projects have been submitted, all with short one page descriptions.
- Detailed project descriptions have been developed for 4 of these projects:
 - FORPRIEM ver. 2.0.
 - Class II-L Monitoring.
 - Effectiveness of the Road Rules in Reducing Hydrologic Connectivity and Significant Sediment Discharge.
 - BMSDF Post-Fire Research and Effectiveness Monitoring
- The EMC will use a ranking process (Appendix F in the Strategic Plan) for project proposals with detailed project descriptions.
- Funding from the Timber Regulation and Forest Restoration (TRFR) Fund is expected to be available for EMC projects in the coming fiscal year (2016).

Brief Update on AB 1492 Topics

- Dr. Russ Henly, CNRA, has reported that the AB 1492 TRFR Program funding for EMC work (\$425,000/year for 2 years) has passed both the Senate and Assembly Budget Committees.
- Link to the “2016 Assembly Bill 1492 Annual Report to the Joint Legislative Budget Committee on the Timber Regulation and Forest Restoration Program”:
http://resources.ca.gov/docs/forestry/AB-1492_Annual_Report_2016_to_Legislature_FINAL.pdf
- Agency members have been selected for the following AB 1492 Working Groups: Data and Monitoring, Ecological Performance Measures (EPM), Administrative Performance Measures, and Interagency Information Systems, as well as for the Business Solutions Team, Interagency Training Team, and Planning Watershed Pilot Project Initiation Team.
- A draft outline for the EPM white paper has been produced. UC Cooperative Extension staff will prepare the draft white paper.
- Campbell Creek has been selected as the first AB 1492 Planning Watershed Pilot Project. It is located in the South Fork Ten Mile River watershed.
- The AB 1492 TRFRP Spring Finance Letter is posted at:
http://web1a.esd.dof.ca.gov/Documents/bcp/1617/FY1617_ORG0540_BCP704.pdf
If approved by the Legislature, this proposal would make on-going and slightly increase limited-term funding to support public involvement processes, technical assistance, and scientific guidance - \$230,000 from the Timber Regulation and Forest Restoration Fund. The proposal also includes Budget Trailer Bill language to permit providing reasonable per diem compensation to persons other than public agency staff who are serving on program advisory committees or working groups.

5. Public Comment

Richard Gienger stated that it is critical to have adequate public participation in the AB 1492 and EMC efforts underway.

6. Field Presentation on the Post-Fire Erosion Studies Underway at BMSDF

In the afternoon, there was a field tour of the post-fire runoff and erosion studies being conducted on Boggs Mountain Demonstration State Forest (BMSDF). Observation and discussion took place at multiple plot and catchment-scale sediment fences installed in the fall of 2015 after the Valley Fire burned BMSDF (see the photos on the following pages). The tour

was led by Drew Coe and Dr. Joe Wagenbrenner, Michigan Technological University. Details regarding the study follow.

The 2015 Valley Fire burned 76,067 acres in September 2015. The burned area included 99% of BMDSF, which is underlain mostly by relatively young volcanic rock. Study objectives include (1) quantifying the impacts of different burn severities on runoff and erosion, (2) assessing the impacts of post-fire salvage logging and site preparation on runoff, erosion, and soil properties, and (3) assessing processes that control post-fire and post-salvage logging.

Burn severity impacts are being studied in six headwater catchments (“channels”) that were instrumented in November 2015 with varying degrees of burn severity to measure runoff and erosion prior to the 2015-2016 winter season. Ground surface cover was measured and rill networks mapped within each small (~0.4-1.6 ac) catchment. The amount of surface cover decreased with increasing burn severity and ranged from 62% in the least severely burned catchment to 32% in the most severely burned catchment (two catchments each for low, moderate, and high burn severity). Results from winter runoff events have shown that runoff and sediment delivery increased with increasing burn severity, and the more severely burned catchments produced the most surface runoff, highest peak flow rates, and largest sediment yields.

Assessment of post-fire salvage logging and site preparation on runoff and erosion will be studied at the plot scale (15 m x 5 m). Five untreated control plots (high burn severity) were installed in November 2015. Plots for treated areas are planned to be installed in the summer of 2016. Treatments will be assessed using five replicated blocks, and each of the five treatments will be represented on one plot in each block. The study includes the following 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).

An additional component of the study is to develop and demonstrate alternative BMPs for post-fire salvage operations. Possible BMPs may include more frequent waterbars, armoring with waterbar outlets with slash, and increasing infiltration on skid trails. Logging will occur in the summer of 2016.

Funding for this study is being pursued through the State Water Resources Control Board's 319(h) non-point source funding program. Additional information on this project is posted at: 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



Gerri Finn, CAL FIRE Boggs Mountain Demonstration State Forest Manager (retired), provides a brief history lesson regarding BMDSF and the Cobb area.



Drew Coe provides a brief overview of post-fire runoff and erosion studies being conducted on BMDSF at catchment-scale Channel #1. Soil burn severity at this site near BMDSF Headquarters was low.



Dr. Joe Wagenbrenner, MTU, describes sediment measurement at catchment-scale Channel #6, a moderately burned swale. Sediment at this fence had been excavated twice during the winter.



Dr. Wagenbrenner explains how an “e-tape” (electronic tape) is used to measure flow through the v-notch weir at the outlet of the sediment fence at catchment Channel #6. Flow data are recorded with a data logger.



Drew Coe and Joe Wagenbrenner describe sediment measurement at a plot-scale sediment fence, installed as a control for the post-fire management study. Plots are 15 m x 5 m.



One of three control plots observed during the MSG field tour installed for the post-fire management study. The plot-scale sediment fences had not been excavated when we observed them.