

Monitoring Study Group Meeting Minutes

April 22, 2009

CAL FIRE Shasta Trinity Unit Headquarters—Redding

The following people attended the MSG meeting: George Gentry (BOF—MSG chair), Clay Brandow (CAL FIRE), Dr. Michael Wopat (CGS), Mike Gaedeke (OSU/Cal Poly-SLO), Drew Loganbill (Cal Poly SLO), Drew Perkins (Cal Poly SLO), Dr. Kate Sullivan (HRC), Kevin Faucher (CTM), Stephen Levesque (CTM), John Munn (CAL FIRE), Dr. Sari Sommarstrom (BOF-TAC), Matthew Buffleben (NCRWQCB), Drew Coe (CVRWQCB), Don Lindsay (CGS), Stacy Stanish (DFG), Arne Hultgren (Roseburg Resources Co.), Dennis Hall (CAL FIRE), Duane Shintaku (CAL FIRE), Dr. Cajun James (SPI), Mike Liquori (SWC), Andrea Stanley (Lahontan RWQCB—on the conference line), and Pete Cafferata (CAL FIRE). **[Action items are shown in bold print].**

The meeting began with general monitoring-related announcements:

- The California Forest Soils Council (CFSC) Fall Meeting will be held at Yosemite National Park [joint meeting of the Professional Soil Scientist Assoc. of California (PSSAC) and CFSC)]. The meeting will be held on September 17-19, 2009, with an optional additional field day on the 20th. For more information, contact Lia Webb, CFSC Co-Chair, at liawebb@w-and-k.com.
- University of California Cooperative Extension (UCCE) is presenting two workshops on “Designing, Improving and Maintaining Forest and Ranch Roads” in May. These sessions are primarily for nonindustrial forest landowners, and include a ½ day of presentations inside and a ½ day in the field. They will be held on May 8th in Jackson and May 22nd in Jamestown. For more information, contact Dr. Richard Harris at rharris@nature.berkeley.edu.
- The 5th Annual California Water Symposium will take place on May 9, 2009 at Wurster Hall Auditorium, UC Berkeley. Results from graduate student research in hydrology applied to environmental restoration and conservation in California will be presented. The symposium is free, but you must contact Josh Pollak in advance (josh.pollak@gmail.com).
- New reports and papers related to monitoring: The paper by Jack Lewis and Rand Eads (both USFS-PSW, retired) on Turbidity Threshold Sampling (TTS) is now available as a published PSW General Technical Report. It is posted at the following website: http://www.fs.fed.us/psw/publications/documents/psw_gtr212/.
- The annual Caspar Creek Watershed Study meeting was held on April 13 and 14th in Fort Bragg. Updates were provided by USFS-PSW scientists on all studies being conducted, including suspended sediment, streamflow, gullying, and large wood input and movement. There was also discussion on planning for the South Fork logging phase and a field trip to view the newly installed fish ladders constructed immediately below both the North Fork and South Fork weirs. For information on the project, see: <http://www.fs.fed.us/psw/topics/water/caspar/>.
- The dramatic culvert failure video taken near from Freeport, Maine is now available for free downloading at: <http://www.wildlandscpr.org/video/road-collapse-caught-video>.
- Pete Cafferata announced that John Munn, Soil Erosion Studies Project Manager for CAL FIRE since 1984, is retiring at the end of April. Pete thanked John for his excellent help with numerous water quality-related monitoring projects over the years and his dedication to the Monitoring Study Group since its inception in 1990. John passes along his gratitude for the good work that the MSG has done over the years and the good people who he has had the opportunity to work with, and a hope for continued, useful project outcomes.

Summary of Water Quality Monitoring Projects in California Forested Watersheds

Drew Coe, Engineering Geologist with the Central Valley Regional Water Quality Control Board, gave a presentation titled “Water Quality Monitoring in the Forested Watersheds of California: Status and Future Directions”, which was mainly based on work conducted by the MSG’s Monitoring and Tracking (M+T) Subcommittee. This group was formed to: (1) catalog water quality related monitoring projects, (2) locate areas of redundancy, (3) evaluate effectiveness of various monitoring approaches, and (4) find ways to make monitoring results more widely available to the public and regulated community. Drew summarized the various reasons for conducting monitoring projects, including: (1) ensuring compliance with regulatory requirements, (2) data collection related to status and trends for resources of concern, (3) adaptive management, and (4) research.

In the spring of 2008, the M+T Subcommittee sent questionnaires to gather information on water quality-related monitoring projects from companies, agencies, and universities conducting water quality monitoring work in California forested watersheds. The basic questions included: (1) who is doing the monitoring, (2) the geomorphic province in which the monitoring is being done, (3) monitoring objectives, (4) types of water quality monitoring activities, (5) whether stakeholders are achieving objectives (data being used), (6) whether monitoring data is available to the public, and (7) whether monitoring activities are cost effective. Seventy-two questionnaires were returned to the subcommittee from 23 different entities.

Forty-nine (68%) of the questionnaires were returned from forest industry representatives, state agencies completed 14 (19%), watershed groups returned 3 (4%), federal agencies turned in 3 (4%), universities provided 2 (3%), and consultants completed 1 (1%). Mendocino Redwood Company, Campbell Timberland Management, Green Diamond Resource Company, and the Central Coast Regional Water Quality Control Board provided the highest number of completed questionnaires. The largest number of reported projects were in Mendocino, Humboldt, and Siskiyou Counties. Considering geomorphic province, 70% were from the Coast Range, 24% from the Klamath Mountains, 15% from the Cascade Range, and only 10% from the Sierra Nevada and Modoc Plateau combined—note that some projects occurred in multiple provinces. Effectiveness, baseline, trend, and research were the most common types of monitoring reported. The most frequently cited reasons for monitoring included adaptive management, voluntary, and regulatory requirements. Nearly two-thirds of the projects do not have objectives framed as testable hypotheses, and 53% use monitoring methods that are primarily quantitative (an additional ~30% use a combination of qualitative and quantitative methods). Overall, roughly half the projects were classified as instream and half as hillslope, with a higher percentage of instream projects being conducted in the Coast Range. The majority of the studies are being done at the watershed or project scale—not ownership or regional scales. Sediment was the most frequent monitoring parameter being studied, and half the respondents stated that monitoring objectives are being met. Approximately 50% of the projects have monitoring reports available and nearly two-thirds of the respondents answered “yes or hopeful” to the question asking if monitoring data are being utilized. Sixty-seven percent of the project responses did not answer the question about whether the monitoring work was cost effective. Drew stated that it is generally difficult to assess the cost effectiveness of monitoring activities.

Brief case studies were then provided for monitoring projects from different monitoring entities: Green Diamond Resource Company (monitoring for an aquatic HCP), Campbell Timberland Management (voluntary, with intensive watershed and fisheries-related studies), Mendocino Redwood Company (fish, amphibian, channel, sediment, and temperature monitoring), and the

Interagency Mitigation Monitoring Project or IMMP (collaborative interagency monitoring focusing on consensus building).

Drew is now working on the second half of the final report for this project that will discuss future directions for monitoring work in California. He stated that incentives are needed for conducting monitoring in forested watersheds, such as promoting the use of monitoring data to inform management and regulation (i.e., using adaptive management to tighten or loosen regulations as appropriate). He contrasted Holling's adaptive management (HAM) model vs. social-political adaptive management (SPAM) and stated that California has tended to fall more into the SPAM model, using a politically driven process without an adequate feedback loop. A process for incorporating science results into policy decisions was illustrated using a slide from a Sound Watershed Consulting presentation. This method requires a common vision by all stakeholders and agreement "up front" on the type and magnitude of change needed to trigger adaptive management and altered management policies. **Drew expects to have a finished final report on the M+T Subcommittee questionnaire data available for review in one to two months.**

Following the presentation, there was considerable discussion regarding how monitoring results are being used in California and the value of continuing to monitor in this state, with widely varying views expressed. Washington's CMER was described as an example of an effective process for dealing with significant watershed-related issues. Drew handed out a paper by Ralph and Poole (2003) titled "Putting Monitoring First: Designing Accountable Ecosystem Restoration and Management Plans" that provides a model showing how monitoring and adaptive management can be an effective process for ecosystem restoration and management (see: http://www.krisweb.com/biblio/gen_uofw_ralphetal_ip.pdf).

Humboldt Redwood Company's Effectiveness Monitoring Program

Dr. Kate Sullivan, Physical Sciences Manager for Humboldt Redwood Company (HRC), provided a PowerPoint presentation titled "Effectiveness Monitoring—What Have We Learned?" on HRC's HCP effectiveness monitoring program. Humboldt Redwood Company, and previously PALCO, have been conducting an aquatic monitoring program for their HCP for approximately 10 years, including both hillslope and instream projects. Additionally, trend monitoring is conducted (e.g., turbidity, sediment, LWD, channel habitat, etc.) as part of the overall HCP aquatic monitoring program, but was not covered in this presentation.

Kate explained that nearly 60% of the PALCO ownership was removed from timber management when the HCP became effective due to interim prescriptions for riparian buffers, mass wasting avoidance areas, etc. This provided the company with a large incentive to conduct required watershed analyses for the major river basins and tailor prescriptions for individual watersheds. The first two completed watershed analyses were for the controversial Freshwater Creek and Elk River basins.

A key management goal related to the aquatic HCP has been to reduce sediment input into watercourse channels, and numerous types of monitoring projects are utilized to determine if current management practices are effective in reducing sediment delivery. Sediment budgets have been developed to describe the estimated magnitudes of the various types of sediment sources, including: road surfaces, landslides, bank erosion, hillslope surface erosion, and skid trail erosion. As an example, the Elk River sediment budget based on watershed analysis (not monitoring results) showed that road and hillslope landslide processes are the dominant sediment delivery mechanisms, greatly exceeding road and hillslope surface erosion input. Delivered sediment from management and legacy practices from 1988-1997 was estimated to

substantially exceed sediment from 2003 to the present (160 mt/km²/yr vs ~55 mt/km²/yr). Kate then described the various types of monitoring projects that have provided data to support this sediment reduction estimate. The first set of studies show that the company is making progress in reducing existing crossing sediment sites (usually the largest road sediment source for the North Coast region is at stream crossing fills).

“Sediment savings sites” identified using PWA road inventory data and then treated in the Freshwater Creek watershed were displayed. For North Fork Elk River, approximately 250,000 yd³ of potential sediment at crossings has been reduced to 50,000 yd³ over the past 11 years. Sediment effectiveness monitoring at treated road plan sites and at Erosion Control Plan (ECP) locations is a key element of the HCP effectiveness monitoring program. Methods include: (1) a compliance audit on all treated sites, (2) wet weather inspections on a random selection of 50% of the sites, and (3) post-erosion void studies on 25% of the sites.

HRC compliance auditors qualitatively determine if the site was treated according to appropriate standards (modified from Weaver and Hagens 1994) prior to winter storms. This compliance audit is currently the weakest link in the effectiveness monitoring program, because the quality of the audits varies considerably by auditor. Wet weather inspections determine if the implemented prescriptions are effective at controlling storm runoff and sediment delivery. Kate stated that this type of monitoring provides a rapid feedback loop, allowing practices to be adjusted to reduce sediment delivery. Wet weather inspections show that the vast majority of sites deliver less than 1 yd³, with a small number producing more than 5 yd³. Post-erosion void studies have been completed at 123 sites to date. PWA conducted part of this work in the South Fork Elk River watershed in 2005 and reported an average of 17 yd³ of sediment delivered per removed stream crossing, which is similar to the amounts reported in several other studies. Also similar to other studies, most of the decommissioned crossings produced no erosion or very little sediment (≤ 3 yd³), and a few produced high values (≥ 20 yd³). Over the past four years, the erosion void monitoring shows that the percentage of sites with measurable erosion has decreased significantly and that the average erosion volume per site has been reduced to 4 yd³, reflecting improved practices.

Next, Kate described road surface sediment studies under way on HRC timberlands. These projects have been used to validate road surface erosion model (e.g., SEDMODL2) erosion rate predictions and to update this component of the sediment budget. Annual sediment yields determined from a comprehensive road sediment study using ISCO pumped suspended sediment samples for numerous road sites have been approximately equal to an adjusted SEDMODL2 estimate used in sediment budget work.

The effectiveness of current management practices are also tested using instream monitoring projects. Kate rapidly summarized a monitoring project used to measure the effectiveness of road construction methods designed to prevent turbidity increases at stream crossings. This includes 2,700 paired, above and below crossing turbidity observations that have been made over three years (20 storms). Kate used a threshold of greater than 20% above background to identify a significant difference for this work (downstream value compared to upstream value). For 2003, 83% of the samples were <20% above background and 17% were >20% above background. In 2004, a drier year, 93% of the samples were <20% above background and 7% were >20% above background. Overall, many of the crossings were always within the 20% standard, some were chronically high, and some occasionally exceeded the 20% standard.

Hillslope effectiveness monitoring projects include a study to measure surface erosion associated with clearcut harvest units. Silt fences were installed in midslope locations, at the

edge of the RMZ, and near the edge of the stream. Delivery of sediment from surface erosion is highly dependent on micro-site features, but overall, very little surface erosion has been measured in clearcut units. Kate also rapidly summarized several other effectiveness monitoring studies, including: (1) THP instream effectiveness monitoring, collecting grab samples above and below harvest units with varying width RMZ for Class II watercourses (increased sediment with logging and road use, but lower values than reported for NF Caspar Creek), (2) a study to evaluate effectiveness of harvesting on sediment yield from Class III watercourses (no significant difference among treatments, post HCP basins tended to have lower sediment yields; see study results in O'Connor et al. 2007 published paper at: http://www.fs.fed.us/psw/publications/documents/psw_qtr194/psw_qtr194_66.pdf), (3) landslide studies using post storm field inspections, aerial photo analysis, and field forensic investigation (significantly reduced landslide delivered sediment in both Elk and Freshwater for the post-1998 period compared to the 1988-1997 period—both with large stressing storms), (4) a Class III channel enlargement by bank erosion study (no results to date), and (5) a study evaluating the effectiveness of RMZs in preventing temperature increases in Class II and Class I watercourses (no difference in water temperatures for prescriptions with 100 foot no cut Class II buffers, and 50 ft no cut with 60% overstory canopy from 50 to 125 ft).

Kate concluded that the HRC effectiveness monitoring work has been cost-effective, that the company has learned a considerable amount, and that the monitoring results are providing a valuable feedback loop for adaptive management and modified field prescriptions. Every monitoring project conducted to date has provided useful information to better inform proper construction of sediment budgets for the large watershed units. In particular, feedback learned from road effectiveness monitoring projects has been very useful.

Updates on the MSG Cooperative Instream Effectiveness Monitoring Projects

Kevin Faucher, Campbell Timberland Management (CTM), provided a brief update on the South Fork Wages Creek cooperative instream monitoring project in Mendocino County with a short PowerPoint presentation. Following an overview of the project (location, hypotheses, monitoring station locations), Kevin explained how he has worked with Rand Eads to replace swinging booms for the recording turbidimeters with bank-mounted booms, and more recently with bed-mounted booms. Data collected to date show that storm turbidity levels have generally been low (10-30 NTUs) for water years 2004-2009, with the exception of the large 2005 storm that produced turbidities in excess of 2,000 NTUs. Bedload appears to be a higher percentage of the total sediment load compared to that found at Caspar Creek. The measurement site equipment functioned well during the winter of 2008/2009, but no large storms occurred. A tentative plan for a THP has been developed and may be implemented within two years. CTM may need approval from the Board of Forestry and Fire Protection (Board) for experimental watershed status to implement the logging plan.

Dr. Cajun James, Sierra Pacific Industries, updated the group on the Judd Creek cooperative instream monitoring project in Tehama County. SPI has an approved THP for the study area and will begin chipping small, non-merchantable trees in 41 clearcut units covering 816 acres next week. Clearcut harvesting will begin following the chipping operation. New road construction and road abandonment work was completed in 2007. No large discharge events have occurred during the past two winters. Turbidity levels did, however, reach 350 NTUs this past winter without a clear indication of what caused the spike. Cajun invited the Monitoring Study Group to visit the study area at a future field meeting.

Graduate students Mike Gaedeke, Drew Loganbill, and Drew Perkins updated the MSG on the Little Creek cooperative instream monitoring project on Cal Poly SLO's Swanton Pacific Ranch in Santa Cruz County. Seven years of pre-treatment data have been collected at four main stem stations. The seven year data set has been broken down into 2 year increments for both the North Fork (NF) and South Fork (SF) stations to determine if a shorter calibration period would have been acceptable. The ratio of NF to SF sediment load was higher during the 2003/2004 period compared to the 2005/2006 and 2007/2008 groups. This illustrates the value of long pre-treatment calibration periods. Logging was conducted under an NTMP during the summer of 2008. Three storm events occurred during the winter of 2008/2009 that produced turbidity values over 20 NTUs. The February 15-16th storm delivered approximately 6 inches of precipitation in 24 hours and the North Fork station had turbidity values of up to 200 NTUs. Data will continue to be collected for three years following logging. A new sediment source survey was conducted, with few changes noted from the previous survey. Geomorphic monitoring work includes 6 study reaches that have been surveyed annually since 2002, each with 10 permanent cross sections and a longitudinal profile through each reach (total station). Databases and spreadsheets have been developed that allow rapid display and analysis of cross-section data. Only small changes in channel depth have been observed, mostly associated with large wood movement.

Formation of a New MSG Effectiveness Monitoring Subcommittee

Due to limited time, George Gentry very briefly introduced the concept of forming a new MSG effectiveness monitoring subcommittee, as a follow-up to the MSG Monitoring and Tracking Subcommittee work. **This group would advise the Board on how to build a monitoring program that could provide an active feedback loop to policy makers for adaptive management. George stated that the time is right for this type of approach and asked those interested to contact him at george.gentry@fire.ca.gov.** Board members have repeatedly asked for a new monitoring program that can provide answers about the effectiveness of rules developed to protect listed anadromous fish species. Additionally, the "2112 coho rules" (CCR 916.9.1 and 916.9.2) require the Board to implement an effectiveness monitoring program. Mr. Gentry would like the Board to move forward and be proactive on this issue. Sari Sommarstrom encouraged George to seek diversity of opinion and representation on this subcommittee, and to not rely on volunteers to staff the group.

Brief Update on the BOF's Revised Threatened or Impaired (T/I) Rule Package

George Gentry quickly updated the MSG on the current status of the Board's revised Threatened or Impaired Watersheds Rule Package. At the April 2009 Board meeting, the full Board voted to put the revised T/I rule package, with numerous options for addressing Class I, II, and III watercourses, out for 45-day public notice. The Board's goal is to adapt a final, revised rule package and file it with the Office of Administrative Law (OAL) by October, so that the revised rules can be in effect on January 1st. George anticipates a second 45 day notice will be necessary. Pete Cafferata provided the group with a 2-page summary of the T/I rule revision effort (available upon email request: pete.cafferata@fire.ca.gov).

Brief update on the FORPRIEM Monitoring Program

Clay Brandow summarized the status of CAL FIRE's FORPRIEM monitoring program. Currently, 29 completed forms have been submitted (14 from Region 1, 3 from Region 2, and 12 from Region 4). Clay is developing a QA/QC procedure for the program, and the FORPRIEM database developed by CAL FIRE's IT unit is fully functional. A new FORPRIEM training

session will be held in Quincy on May 14th. People interested in participating should contact Clay at clay.brandow@fire.ca.gov. The FORPRIEM monitoring methods are posted at: http://www.bof.fire.ca.gov/board_committees/monitoring_study_group/msg_archived_documents/msg_archived_documents_forpriem_proceduresmethods_091407.pdf

New and Unfinished Business/Public Comment

Mike Liquori announced that he is the chair of the research committee for the Jackson Demonstration State Forest Advisory Committee (JAG). This group is now seeking external stakeholder comments on a research agenda for JDSF. Mike asked MSG participants to contact him by email with suggestions for research on JDSF (mike@soundwatershed.net).

Next MSG Meeting

The tentative date for the next MSG meeting is July 22, 2009. When a location and agenda are available, they will be emailed out to the group.