

Monitoring Study Group Meeting Minutes

May 23, 2006

CDF Shasta-Trinity Unit Headquarters, Redding

The following people attended the MSG meeting: Peter Ribar (CTM), Matthew Buffleben (NCRWQCB), Richard Gienger (HWC/SSRC), Marty Hartzell (CVRWQCB), Clay Brandow (CDF), Mike Laing (NCCFFF), Duane Shintaku (CDF), Shane Cunningham (CDF), Dr. Michael Wopat (CGS), Stuart Farber (Timber Products Co.), Sam Flanagan (NOAA Fisheries), Dave Hope (NCRWQCB), Chantz Joyce (WMB), Matthew Boone (CVRWQCB), Debra Hallis (CVRWQCB), Angela Wilson (CVRWQCB), Drew Coe (CVRWQCB), Dennis Hall (CDF), John Knight (CDF), Rich Klug (Roseburg Resources), Melenee Emanuel (SWRCB), Heidi Hall (SWRCB), Tharon O'Dell (GDRCO), Chris Keithley (CDF), Jim Ostrowski (BOF), Dawn McGuire (DFG), Jim Pedri (CVRWQCB), Dr. Cajun James (SPI), Stacy Stanish (DFG), Dr. Richard Harris (UCB), and Pete Cafferata (CDF). Participating by phone were: Palma Risler (US EPA) and Doug Cushman (Lahontan RWQCB). **[Note: action items are shown in bold print].**

We began the meeting with general monitoring-related announcements:

- Richard Gienger announced that the 9th Annual Coho Confab will take place on August 25-27, 2006 in the Tomales Bay area. Additional information is available on both the Trees Foundation (<http://www.treesfoundation.org/publications/topic-18>) and Salmonid Restoration Federation (<http://www.calsalmon.org/>) websites.
- Pete Cafferata stated that the Watershed Management Council 2006 Biennial Conference titled "Community Action and Innovation for Watershed Sustainability" will be held in Walla Walla, Washington on October 16-20, 2006 (see the WMC website for more information: <http://www.watershed.org>)
- As requested by Gary Peterson, Pete Cafferata announced that the SWRCB's Surface Water Ambient Monitoring Program (SWAMP) Field Method's Course Modules are available online (see: <http://unexdlc.ucdavis.edu/cfmx/DLC/demos/swampFT/index.html>) Modules include: reconnaissance, field measurements, flow measurements, water sampling, sediment sampling, and sample handling/shipping.
- Clay Brandow stated that comments on the Modified Completion Report draft final report are to be submitted to him (clay.brandow@fire.ca.gov) by June 2, 2006. The report is posted on the Monitoring Study Group's website under Supported Reports at: http://www.bof.fire.ca.gov/pdfs/MCRFinalReport_%20Draft2006_04_27.pdf. Clay will present the final report to the Board of Forestry and Fire Protection at their July meeting.
- Cajun James announced that RNSP (Randy Klein), USFS-PSW, CDF, and SPI are teaming to conduct a study comparing turbidity data collected with different types of turbidimeters this summer and fall. The project proposal is available from Pete Cafferata upon request.

San Francisquito Watershed Study Presentation

Richard Harris provided the MSG with a brief PowerPoint presentation on a report he wrote titled "Local Agency Policies and Procedures for Protecting Steelhead Habitat, San Francisquito Watershed." This document was prepared for the San Francisquito Watershed Council. The main study objectives were to: (1) determine what policies and procedures local jurisdictions use to control land use impacts on steelhead habitat, and (2) provide recommendations for improving land use policies and practices related to fish habitat.

San Francisquito Creek is located in the heavily populated Bay Area (San Mateo and Santa Clara Counties—including a significant portion of Stanford University), covering

28,800 acres. The basin is a 303(d) listed watershed for sediment but a TMDL has yet to be produced. The main stem and tributaries still have steelhead runs but fish passage is impaired throughout the watershed.

The primary process used was to meet with the local jurisdictions and to review all pertinent policies and ordinances. Typical development sites were selected and reviewed in the field. Legacy issues associated with existing development were found to pose a greater risk to fish habitat than new development. Richard reported that treatment of fish passage barriers and bank stabilization are the main issues that require watershed-scale solutions. Problems were also found with houses built into riparian zones. Newer development is using innovative approaches to control non-point source pollution and hydrologic impacts. Examples shown of these types of treatments included bio-engineering for bank treatments, urban storm water treatment practices, and erosion control measures at cross drain outfalls. New subdivisions are subject to extreme levels of environmental regulation.

Recommendations provided in the report include: (1) more consistent riparian management, (2) cooperative efforts to remove barriers, (3) more consistent regulation of re-development, and (4) watershed-wide approaches for bank stabilization. Richard stated that these are best achieved through existing collaborative organizations in the watershed.

Sediment Production and Delivery from Forest Roads in the Sierra Nevada

Drew Coe, CVRWQCB, provided the group with a detailed PowerPoint presentation on his completed Masters thesis from Colorado State University titled “Sediment Production and Delivery from Forest Roads in the Sierra Nevada, California.” The thesis is posted on the MSG website at: http://www.bof.fire.ca.gov/pdfs/DrewCoe_FinalThesis.pdf and the PowerPoint presentation is posted at: <http://www.bof.fire.ca.gov/pdfs/CoeMay2006MSGPresentation.pdf>.

Drew began his presentation by stating that sediment is the main pollutant of concern for water quality impairment in the Sierra Nevada. There is generally a lack of sediment data in the Sierra, but it is needed for regional knowledge related to site-scale mitigation measures and new spatially-explicit CWE models (to replace the older ERA methodology). Data was collected from three winter seasons (1999-2000, 2000-2001, 2001-2002) in the central Sierra Nevada. Sites were located on weathered granodiorite, andesitic lahar deposits, and granitic glacial deposits. The first wet season, approximately 100 sediment fences were installed on roads, harvest units, off-road vehicle areas, prescribed and wildfire areas, and undisturbed areas. Mean sediment production rates were 0.9 kg m⁻² for roads, 0.1 kg m⁻² for skid trails, 0.4 kg m⁻² for ORV trails, 0.001 kg m⁻² for minimally disturbed sites, 1.1 kg m⁻² for high burn severity areas, and 0.001 kg m⁻² for sites burned with prescribed fire. A decision was made to focus data collection efforts for the next two winter seasons on roads due to their high sediment production rates. The thesis is composed of two publishable papers—one on road sediment production and the other on road sediment delivery.

The study objectives for the road sediment production portion of the study were to: (1) measure sediment production from unpaved roads over 3 wet seasons, (2) identify dominant controls on road sediment production, and (3) develop predictive models for road sediment production. After providing some background information on erosion and sediment production from the literature, Drew described sampling methods and sample

design. Data was collected from a winter season for 45 ungraded, native surface road segments (i.e., 15 segments x 3 yrs); 64 recently graded, native surface roads; 28 ungraded, rocked roads; and 2 recently graded, rocked roads; for a total of 139 segment years. Field sites were mostly located on the El Dorado National Forest, with not quite one-quarter on SPI lands. Five dependent variables and 16 independent variables were used for statistical analyses that included multiple regression. The first wet season had near-normal precipitation, while the second and third winters had less than average precipitation (proportions of rain and snow also varied by year).

Drew reported a 16 fold difference in median sediment production rates between rocked and unrocked road segments and stated that this a more accurate indication of the effect of rocking on road sediment production than a comparison of the mean rates, since the distribution of sediment production rates was highly skewed by a few segments with exceptionally high values. Sediment production was highly variable within and between years, and there was more variability in production from native surface roads compared to rocked roads. Abundance of snowfall in 2nd and 3rd wet seasons decreased rain splash and hydraulic erosion. Sediment production decreased with increasing soil depth for midslope roads, since hillslopes with the shallowest soils intercepted the most subsurface flow. Recently-graded roads produced more than twice as much sediment per unit area as ungraded roads, but the effects of grading diminished with increasing site elevation. Modeling results showed that the area x slope factor ($A*S$) explained 44% of the variability in sediment production rates for native surface roads. A model with $A*S$, annual rainfall erosivity, and an interaction variable for grading explained 56% of the variability in sediment production from native surface roads. The sediment production results from this study are generally comparable to those found in earlier studies, with the exception of results from coastal Washington reported by Reid and Dunne (1984).

For the sediment delivery portion of the study, Drew randomly selected 20 1-km road transects were from USGS topographic maps. Each 1-km transect was broken into segments defined by drainage outlets such as waterbars, rolling dips, ditch relief culverts, etc. ($n=285$). Road segments were classified into three road drainage types: outsloped, outsloped and bermed, or insloped segments drained by cross-relief culverts. Four connectivity classes (CCs) were assigned for each road segment: (1) no signs of gullying or sediment transport below outlet (CC1), (2) gullies or sediment plumes <20 m in length (CC2), (3) gullies or sediment plumes >20 m in length but more than 10 m from channel (CC3), and (4) gullies or sediment plumes to within 10 m of a stream channel (CC4).

Overall, 64% of the total road length showed little or no signs of sediment transport and 26% was connected to channel network. Sixteen percent of the individual road segments were connected to the stream network. Stream crossings were the main causal mechanism for sediment delivery to the channel network, accounting for 59% of the connected road segments. Another 35% of the road segments classified were connected to the channel network by gullies and 6% of the road segments were connected to the channel network by sediment plumes. The road segments classified as CC3 and CC4 were significantly longer than the segments classified as CC1 and CC2. Additionally, 90% of insloped roads were CC3 or CC4. Sediment travel distance was generally less than 40 m.

A regression model with soil K factor, road length, a binary variable for presence or absence of a gully, and a binary variable for traffic level could only predict 39% of variability in sediment travel distance below drainage outlets. Road segments with gullies

had double the segment length of segments without gullies. Gully initiation was found to be associated with a factor for segment length x hillslope gradient ($L \cdot S_H$), presence or absence of a cross-relief culvert, and hillslope surface roughness. Gully volumes ranged from 0.01 m^3 to 153 m^3 , with a mean of 20 m^3 . Gully volume was best predicted by an equation with a factor for slope length x hillslope gradient ($L \cdot S_H$), soil K factor, and presence or absence of a relief culvert ($r^2 = 0.60$). Overall, the percent of roads connected to streams is related to mean annual precipitation and the presence or absence of road drainage structures ($r^2 = 0.92$). The average sediment delivery rate from road surfaces and road-induced gullies was estimated as $2.0 \text{ Mg km}^{-1} \text{ yr}^{-1}$ (with $0.6 \text{ Mg km}^{-1} \text{ yr}^{-1}$ from gullies and $1.4 \text{ Mg km}^{-1} \text{ yr}^{-1}$ from road surfaces).

Drew briefly discussed the relationship between hillslope sediment yields and down-stream channel reach conditions in the central Sierra. Channel conditions were measured in 28 pool-riffle ($\leq 2\%$ gradient) reaches in the American and Cosumnes river basins. Variables used to characterize the amount of watershed disturbance included road density, number of road crossings, modeled road sediment production, percent forest harvest, and the percent burned by wildfire. Pool infilling was positively correlated with road density (and modeled road sediment production) for basins with more than 20% of the area in granitic lithologies ($r^2 = 0.32$). No other significant correlations between the measured channel characteristics and the amount of disturbance were found.

The main management implications from this work were stated as: (1) rock native surface roads at stream crossings, (2) reduce number of stream crossings, (3) decrease drainage spacing to reduce road area or length, (4) avoid insloping roads and use energy dissipators near watercourses, and (5) place new roads at least 40 m from streams. During the discussion following the PowerPoint presentation, Drew stated that older roads are mainly the ones with erosion issues and that what is observed for newer roads is generally good. He added that maintained haul roads typically have lower A*S values, which limits sediment production, and that when the Forest Practice Rules are properly implemented, sediment delivery is usually not an issue.

SWRCB Management Measures to Track Forestry-Related Impacts

Ms. Heidi Hall, SWRCB, led a brief discussion on appropriate management measures to track forestry-related impacts on water quality for the State Water Resources Control Board. She stated that the SWRCB is looking for input on parameters to track to determine how effective practices are in controlling non-point source pollution related to forestry operations. The list of potential management measures (listed as 2A to 2L) included: pre-harvest planning, streamside management areas, road construction/reconstruction, road management, timber harvesting, site preparation/forest regeneration, fire management, revegetation of disturbed areas, forest chemical management, wetlands forest, post-harvest evaluation, and education/outreach.

Heidi stated that the SWRCB is working towards selecting a smaller number of management measures that will provide a statewide "picture" of practice impacts. Tetra Tech has a contract with the SWRCB to produce a literature review and summary of what has been done to date regarding monitoring and tracking of forestry impacts, as well as GIS layers displaying information. It is anticipated that this contracting effort will provide information leading to determination of the appropriate management measures to select for tracking impacts to water quality.

Heidi asked the assembled group to provide input on which management measures (2A to 2L) would be the best to examine, and how best to obtain the existing data. Input on this topic is to be provided to Heidi at: hhall@waterboards.ca.gov. The hope is to: (1) select the key measures, (2) get funding for data collection, (3) collect data over the next 7 years, and (4) complete the effort for the SWRCB 15-year Non-Point Source Plan. Clay Brandow stated that for the 5-year Non-Point Source Plan, forestry has considerably more data than most of the other categories, such as agriculture.

Reference Watersheds Project Update

Chris Keithley announced that the draft MSG-developed watershed list for very minimally disturbed (i.e., “reference”) watersheds has been used to develop a GIS geodatabase for delineating the boundaries of the basins. The GIS layer and associated database are intended to support community-based watershed groups and government agencies conducting watershed assessments. **The draft product is now posted at: <http://frap.cdf.ca.gov/watersheds/referencewatershed.html>.** Chris asked MSG participants to use the site and provide input to him on missing reference watersheds, inaccurate data, or inaccurate watershed boundaries. Email comments to: frapwatershedweb@fire.ca.gov.

MSG Interagency Mitigation Monitoring Program (IMMP) Update

Pete Cafferata briefly summarized the IMMP Subcommittee’s first field training session that was held on May 17-18, 2006 in western Mendocino County. The USFS Regional BMP monitoring questions for crossings and roads that drain to crossings (136 questions), California-specific questions generated by the IMMP Subcommittee (49 questions), and CGS-generated overview questions (8 questions) were used at five crossings (1 abandoned crossing, 2 older culverts, and 2 bridges of varying ages) over the two days. The Coast and Inland teams worked independently at 4 of the 5 crossings evaluated. Data were recorded into 2 HP iPAQ pocket PC units, which worked relatively well. The California-specific questions were simple to use, but numerous questions arose regarding use of the USFS BMP questions and repeatability was relatively poor. How to deal with “trace” amounts of sediment input to watercourses was a key issue discussed at each of these crossings. Older crossings were difficult to evaluate, since legacy impacts were difficult to disassociate from current impacts with the USFS BMP procedure. Also, the assessment of approaches to crossings that remain within wide Class I WLPZs was another issue at several crossings. Clarification from the USFS’s Dave Welsch will be obtained prior to the next field training session. **Detailed meeting notes are available from Pete Cafferata (pete.cafferata@fire.ca.gov).**

The next MSG IMMP Subcommittee field training session will be held on June 20-21, 2006 at LaTour Demonstration State Forest, located east of Redding. Also, a short letter explaining the IMMP pilot project has been prepared for landowners and others, and will be widely distributed shortly. The Coast IMMP team has initially reserved July 10-14, August 21-25, and September 25-29 for pilot work, while the Inland team has set aside July 17-21, August 28-September 1, and September 18-22 for this project. The first phase of the pilot is anticipated to run through March 2007.

Gienger “Monitoring/Tracking by Plan Proponents Proposal” Discussion

Richard Gienger led a discussion on his “Monitoring/Tracking by Plan Proponents” proposal, which he plans to submit to the Board of Forestry and Fire Protection in the near future. Richard stated that he is proposing this language to place responsibility for monitoring on the plan proponent. Currently, he said, the public has little assurance that plans are properly implemented and effective. Richard provided a three page support letter for his proposal to the MSG participants. Peter Ribar stated that this proposal is a redundant process that is not necessary. Cajun James stated that she believes there is a large disparity between the amount of monitoring/tracking that occurs for large landowners and that completed for small, nonindustrial landowners. There was general agreement that it currently is not easy for interested parties to observe what monitoring and/or tracking documents exist for a given plan.

Board member Jim Ostrowski asked that a list be put together showing collectively what all the agencies are doing for monitoring and tracking related to timber harvesting on private lands in California. He stated that this will allow the Board to see if this additional requirement is merited. Dennis Hall stated that an MSG subcommittee could be established to produce this list and further refine Richard’s proposal prior to submittal to the BOF.

Literature Review for the Threatened or Impaired Watersheds Regulations

The BOF’s Forest Practice Committee has held several meeting recently to discuss how to conduct a scientific review of the Board’s Threatened or Impaired Watersheds Regulations. The review is to focus on riparian buffer strip requirements related to anadromous fish and domestic water supplies. Cajun James and Stu Farber, with input from others, have produced a draft guideline document for the literature review (see: http://www.bof.fire.ca.gov/pdfs/BOFScientificReviewCJ_1May2006.pdf). This paper provides procedures to follow and criteria to use for reviewing the literature on this topic. CDF also provided an outline for the literature review. NOAA Fisheries, with input from MSG participants, has developed a detailed Excel spreadsheet summarizing existing literature for different riparian buffer strip functions and CH2M-Hill has produced an annotated bibliography on this topic for CFA. It had been hoped that Tetra Tech could be used as a contractor for completing the literature review, with guidance from an oversight committee, but funding for this contract appears doubtful. Further discussion on this topic occurred on June 5th in Sacramento at a Forest Practice Committee meeting.

Revised MSG Draft Strategic Plan

There was insufficient time to discuss the revised DRAFT MSG Strategic Plan but the document was handed out for review and it is posted on the MSG website at: http://www.bof.fire.ca.gov/pdfs/MSGStrategicPlan_4a_.pdf. Discussion of this document will occur at the next MSG meeting.

Next MSG Meeting

No date was set for the next MSG meeting, but it is anticipated that it will occur in August or September. A tentative date with alternates will be emailed to the group in the near future.