

Monitoring Study Group Meeting Minutes

December 10, 2008

CAL FIRE Shasta-Trinity Unit Headquarters

The following people attended the MSG meeting: George Gentry (BOF—MSG Chair), Jim Ostrowski (BOF), Clay Brandow (CAL FIRE), Barry Hill (USFS), John Munn (CAL FIRE), Stormer Feiler (NCRWQCB), Bruce Beck (CAL FIRE), Rhianna Lee (DFG), Angela Wilson (CVRWQCB), Matt Boone (CVRWQCB), Debra Hallis (CVRWQCB), Stacy Stanish (DFG), Dennis Hall (CAL FIRE), Sandra Pérez (5 Counties Salmonid Conservation Program), Mark Lancaster (5 Counties Salmonid Conservation Program), Mike Laing (NCCFFF), Dr. Richard Harris (UCCE), Dr. Michael Wopat (CGS), and Pete Cafferata (CAL FIRE). **[Action items are shown in bold print].**

The meeting began with general monitoring-related announcements:

- The American Geophysical Union Fall Meeting is being held in San Francisco from December 15-19th. Hydrology sessions include: “Who Knows How the River Flows? Understanding Sediment Movement Through Fluvial Networks” and “Strengths and Limitations of the Paired Watershed and Model Approaches to Detect Change in Hydrology and Water Quality Research.” More information is available at: <http://www.agu.org/>
- The 30th Annual Forest Vegetation Management Conference titled “Integrated Pest Management in Western Forests” will be held on January 20-22, 2009 at the Holiday Inn in Redding. For more information, contact: Dave Gallagher (daveg@totalforestry.net) or Danielle Lindler (jrc@gotsky.com). The conference flyer is available at: <http://groups.ucanr.org/Forest/files/59588.pdf>
- The SEAT (State Emergency Assessment Team) post-fire assessment reports for the Basin, Summit, Gap, Telegraph, Mendocino Complex, Marek, Piute, and Butte Complex wildfires are posted on the web at: http://hazardmitigation.oes.ca.gov/state_emergency_assessment_team
- A new report is available titled “Maximizing the Efficiency and Effectiveness of Water Quality Data Collection and Dissemination--and Ensuring that Collected Data are Maintained and Available for Use by Decision-Makers and the Public.” This report documents the recommendations of the California Water Quality Monitoring Council and is dated December 1, 2008. It is available at: http://www.swrcb.ca.gov/water_issues/programs/monitoring_council/docs/sb_1070_full_report_final.pdf
- Another new report titled “Salmon, Steelhead, and Trout in California: Status of an Emblematic Fauna” is available from the CalTrout webpage. This report from the Center for Watershed Sciences, UC Davis, was commissioned by CalTrout and the senior author is Dr. Peter Moyle. See: <http://www.caltrout.org/SOS-Californias-Native-Fish-Crisis-Final-Report.pdf>
- The Scholars Archive website for Oregon State University includes Masters and PhD dissertations. It is located at: <http://ir.library.oregonstate.edu/dspace/>. Chris Surfleet’s recent (July 2008) PhD dissertation titled “Uncertainty in Forest Road Hydrologic Modeling and Catchment Scale Assessment of Forest Road Sediment Yield” is posted on this site. This thesis includes plots of road runoff and sediment yield for various types of roads in the South Fork of the Albion River watershed. In addition, at least three Oregon Hinkle Creek paired watershed study MS theses are now on line (type in Hinkle Creek in the Search Tool).

Best Management Practices Monitoring Results for National Forests in California

Barry Hill, Regional Hydrologist for the U.S. Forest Service Pacific Southwest Region (Region 5), provided a presentation on the USFS's Best Management Practices Effectiveness Program (BMPEP) monitoring results. The Forest Service's BMPs were certified by the U.S. EPA in 1979, and Region 5 began the BMPEP in 1992 to fulfill monitoring commitments to the State Water Resources Control Board (SWRCB). The BMPEP uses 29 onsite monitoring procedures to evaluate implementation and effectiveness for protecting water quality (administrative and in-channel evaluations are also part of the program, but were not covered in this presentation). Monitoring is conducted on all 18 National Forests in California, covering approximately 20,000,000 acres. A list of the 96 BMPs (or groups of BMPs) evaluated and a brief description of the BMPEP is provided in a document titled "Water Quality Management for Forest Service Lands in California—Best Management Practices" that is available at:

http://www.fs.fed.us/r5/publications/water_resources/waterquality/water-best-mgmt.pdf.

Mr. Hill has written a draft report on BMPEP monitoring results from 2003-2007. This report updates the results presented in a report written by Brian Staab, previous Regional Hydrologist, for 1992-2002 and published in November 2004.

Barry explained that USFS BMPs are evaluated for seven main program areas: timber, engineering (roads), recreation, grazing, mining, prescribed fire, and vegetation management. Timber onsite monitoring protocols include streamside management zones (SMZs), skid trails, suspended yarding, landings, timber sale administration, special erosion control, and meadow protection. Engineering protocols include: road surface, drainage, slope protection; stream crossings; road decommissioning; control of sidecast; servicing and refueling; in-channel construction practices; temporary roads; rip-rap composition; water source development; snow removal; pioneer road construction; restoration of borrow pits and quarries; and protection of roads during wet periods.

Examples of several BMPs and their associated, specific requirements were displayed, including SMZs, control of road drainage, grazing permits, and wildfire suppression rehabilitation. The stream crossing BMPEP monitoring protocol was used to illustrate specific questions for BMP implementation and effectiveness (additionally, the field form for the skid trail protocol is included on pages 131 and 132 in the document on the website provided above).

While data is collected from both random and non-random field sites, only data from randomly located sites are summarized in Barry's draft report. BMP implementation is rated by answering a series of questions to determine if a project was properly executed as described in the project documents. Numeric ratings range from 1 (good) to 4 (bad) for implementation. Scores for all implementation questions are summed and compared to a predetermined threshold to conclude whether BMP implementation was adequate. BMP effectiveness relies on indirect measures of water quality protection based on observation and on quantitative measurements. Each protocol includes guidelines for rating activities in one of three categories corresponding to insignificant (unmeasurable), minor, and significant levels of adverse effects. A scoring system similar to that used for implementation is used to determine adequate BMP effectiveness.

A total of 2,861 BMPs were evaluated for implementation and effectiveness from 2003 through 2007 using the 29 monitoring protocols, with 86% rated as being adequately implemented and 89% rated as being effective. Among the properly implemented BMPs, 93% were rated as effective. For all the sites rated, 92% were found to have no potential or

actual adverse effects on water quality. Using individual activity categories, implementation and effectiveness averages were, respectively, for timber - 90% and 96%; roads - 88% and 85%; recreation - 73% and 73%; range - 94% and 81%; fire - 87% and 98%; mining - 24% and 85%, and vegetation management - 98% and 96. BMP categories with the highest effectiveness ratings are timber, prescribed fire, and vegetation management, while BMPs requiring the greatest improvement in implementation are related to range and recreation activities. For most National Forests, effectiveness of implemented BMPs was substantially higher than effectiveness of all BMPs, indicating that lack of implementation is a major cause of ineffective BMPs. Overall, the BMPs most likely to be associated with measurable adverse water quality effects were found at: (1) developed recreation sites, (2) water source development, and (3) stream crossings.

Mr. Hill informed the group that the BMPEP scoring procedure is currently being improved. Several of the BMP monitoring field forms and questions have been revised since 1992, making the predetermined threshold (or "inference point") for pass/fail for a BMP out of date. A new "Frazier Protocol" (developed by a group led by Stanislaus NF Forest Hydrologist Jim Frazier) will be used in the future. This scoring protocol does not use inference points, but instead rates BMPs as successful or not based on whether individual responses to questions indicate departures. For example, a passing rating for implementation will be assigned if all questions are answered as exceeding or meeting BMP requirements (i.e., categories 1 or 2), or less than half are minor departures (category 3), and none are major BMP departures (category 4). Effectiveness in the new system is assigned a passing rating if all rating items are in column 1 (insignificant effect) or a combination of column 1 and 2 (minor level of adverse effect), with less than half of the rating items in column 2. No ratings can be assigned to column 3 (significant level of adverse effect).

In summary, Barry stated that: (1) most BMPs are effective when implemented; (2) improved implementation is the most effective means of improving protection of water quality; (3) results show improvements in implementation, effectiveness, and numbers of evaluations; and (4) changes to scoring procedures are needed.

Five Counties Road Inventory Program and the Direct Inventory of Roads and Treatments (DIRT) Database

Mark Lancaster and Sandra Pérez from the Five Counties Salmonid Conservation Program gave a PowerPoint presentation on the Five Counties Road Inventory Program and the Direct Inventory of Roads and Treatments (DIRT) database. Mark began the talk by providing background information regarding the Five Counties Program. It started in 1998, with a goal of seeking opportunities to contribute to the long-term recovery of salmon and steelhead in Northern California. County road erosion assessments are used to help accomplish this goal. The Five Counties Program writes grant proposals, conducts road inventories, and upgrades high priority sites. This work includes an inventory of stream crossings and other significant road-related sources of erosion. Field crews identify and quantify future road-related sediment sources most likely to impact streams, develop site-specific recommended treatments, and evaluate the likelihood for erosion and overall immediacy of treatments. To date, grants totaling more than one million dollars have been received to conduct this work.

Mark stated that the watershed indicators in the Trinity River TMDL provide a good approach for conducting road inventory work. These indicators (and targets) include diversion potential and crossing failure potential (<1% of crossings fail in a 100-yr storm); hydrologic connectivity (decreasing quantity of diverted streams and length of ditches); annual road inspection and correction (increased mileage inspected and corrected); road location, surfacing, and

sidecast (reduced density near streams, increased percentage outsloped and hard surfaced); activities in unstable areas (avoid and/or eliminate); and disturbed areas (decrease in impaired subareas). Several examples were shown of road problem areas in the five counties area and road improvements that have been made using these indicators/targets.

To date, 2,455 miles of road have been inventoried in Del Norte, Humboldt, Mendocino, Siskiyou, and Trinity Counties (Humboldt and Siskiyou Counties have yet to be completed). A total of 9,661 erosion sites have been identified, with a potential sediment yield of 3.63 million cubic yards (projected over 10 years). Eighty-one percent of the sediment volume is associated with stream crossings, 9% comes from ditch relief culverts, 4% from fillslope landslides, and 1-2% each from road inboard ditches, hillslope landslides, road beds, cutbank landslides, and other problems. An erosion site is defined as having at least 20 yd³ of road-related sediment that can be delivered to a channel. It was estimated prior to the inventories that approximately \$150 million would be needed to repair all sites. Mark stated that the five counties area has been averaging at least one large (6-12 ft) culverted crossing failure per year over the past several years.

Sandra Pérez explained how the Direct Inventory of Roads and Treatments (DIRT) database was developed in 2000, based on Pacific Watershed Associates (PWA) protocols for private roads. These protocols were modified for county roads. Only sediment source sites with the potential to deliver at least 20 yd³ over a 10 year period are entered into the database (both chronic and episodic erosion sites are inventoried). The annual chronic sediment estimate is multiplied by 10 to produce a decadal amount, which is then added to the episodic sediment estimate for a total potential yield. GIS mapping capability is included as part of the database (GIS coordinates are entered for each site). Site types entered in the database include stream crossings, landslides, ditch relief culverts, etc. Site assessments include a determination of treatment immediacy (i.e., urgent, high, high-mod, mod, mod-low, and low), the likelihood to erode and deliver sediment, the total volume of potential erosion, and recommended treatments.

Field crews use the same DIRT Access database interface to enter data in the field with laptop computers (Rite-in-the-Rain bound notebooks are used to record data, which is then entered electronically in a field vehicle prior to leaving the road). Several types of data are entered, including general information (e.g., county, watershed, date), GPS information, site evaluation information, and information on potential sediment savings. Sandra showed examples of the data screens (tabs) that are used for more detailed information on culverts, stream crossing volumes, landslides, chronic surface erosion, spoil sites, and treatments. She stated that the DIRT database is easy to query and provides reports with counts, percentages for types of sites, volume of sediment associated with specific types of sites, etc. for counties or watersheds. For example, a high or urgent treatment immediacy has been assigned to 56% of the potential erosion sites. Many of the DIRT data fields can be displayed on maps for rapidly showing where high and urgent treatment immediacy sites are located in a watershed. The DIRT database is available to the public (but does not include the copyrighted software such as Microsoft Access or ArcView 9.X needed to use it).

Three main strategies are used to monitor upgraded road sites: (1) field review to verify treatments were implemented according to design parameters and whether the Trinity County TMDL objectives/targets were met (2) re-inventory with DIRT database entry, and (3) photo points used before and after project implementation.

Mark completed the presentation by explaining how the Five Counties Program is training county personnel on proper road improvement methods. These include using outsloping for

road drainage rather than insloping with ditchlines when safe and suitable, avoiding placing critical dips into unconsolidated fill, and decreasing hydrologic connectivity. Mark stated that information on the Five Counties Program and past reports are available on their webpages at: <http://www.5counties.org/> and <http://www.5counties.org/Documents800.htm>.

MSG Monitoring and Tracking Subcommittee Update

George Gentry and Pete Cafferata provided a brief update on MSG Monitoring and Tracking (M+T) Subcommittee work. This subcommittee 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. In the spring of 2008, the subcommittee sent questionnaires to monitoring entities for gathering information on forestry water quality related monitoring projects in California. Sixty-four of these questionnaires were returned from 23 different entities. Information requested included: (1) landowner name; (2) project title; (3) geomorphic province (region) in which the monitoring was done; (4) study objectives; (5) whether hypothesis testing is being done; (6) whether monitoring is being done at the hillslope scale, in-channel, or both; (7) whether any results or conclusions have been generated; and (8) whether there is a report available.

Drew Coe, CVRWQCB, developed the questionnaire and provided a handout summarizing the data in the questionnaires. He is also writing a technical paper using the data that will be available in January 2009. Drew's summary shows that industrial landowners submitted the most questionnaires, accounting for over 60% of the reported monitoring studies. Responses to questionnaires varied in level of detail and completeness, making it difficult to draw inferences from answers to most questions. Answers were typically complete for sections 1-3 (i.e., description, objectives, methods) of the questionnaire, but there was less feedback for sections 4-7 (utilizing data, data availability, etc). Landowners/stakeholders that did more quantitative and rigorous monitoring were more likely to fill out the entire questionnaire. Also, monitoring cost information was rarely disclosed. When stratified by geomorphic province, most of the identified studies are being conducted in the Coast Range province, with the fewest studies coming from the Sierra Nevada province. The majority of these monitoring studies are focused on sediment issues. Most of the studies evaluating habitat or biological response are located in the Coast Range. Roughly one-quarter of the reported monitoring studies perform quantitative hypothesis testing.

Drew's tentative initial findings include a need for: (1) standardized monitoring protocols among stakeholders; (2) nested monitoring to address multiple monitoring objectives in an integrated fashion; (3) adopting more rigorous and quantitative monitoring that can apply a true adaptive management model, and (4) a cooperative framework among stakeholders so that standardized protocols can be established, redundancy can be reduced or eliminated, and remaining uncertainties regarding forestry-water issues can be addressed.

George Gentry stated that M+T Subcommittee conference calls will resume once Drew Coe has finished his technical report summarizing the monitoring questionnaires.

MSG Interagency Mitigation Monitoring Program (IMMP) Subcommittee Update

Pete Cafferata stated that the final version of the IMMP Subcommittee pilot project final report was presented to the BOF at the October Meeting in Sacramento. Presenters included Shane Cunningham, Dave Longstreth, Angela Wilson, Anthony Lukacic, Stacy Stanish, and Pete Cafferata. The final report is posted on the Monitoring Study Group website under

Supported Reports at:

http://www.fire.ca.gov/CDFBOFDB/PDFS/IMMP_PilotProjectRpt_FinalVer.pdf

Dennis Hall stated that funding and staffing limitations have prevented CAL FIRE from committing at this time to the recommended next phase of the IMMP using rotating multiagency field teams. **Angela Wilson informed the group that it would be possible to use a streamlined version of the watercourse crossing protocol and that this topic should be discussed at the next IMMP Subcommittee meeting (i.e., 15-30 min/crossing vs. 45 min to 1½ hr).** Dennis Hall stated that other topics besides watercourse crossings could be monitored with the IMMP process and that this should be discussed as well.

Technical Advisory Committee Update and Summary of the Technical Expert Forum

George Gentry briefly summarized the Board of Forestry and Fire Protection's Technical Expert Forum held on October 23rd in Sacramento. A handout with the PowerPoint presentations from Drs. Robert Beschta, George Ice, Lee Benda, Lee MacDonald, Tom Lisle, Mary Ann Madej, and Gordie Reeves was provided. **A CD ROM is available with the audio presentations and the PowerPoints for each speaker. Additionally, a DVD of the presentations is available from the Board.**

The final version of the Sound Watershed Consulting (SWC) report titled "Scientific Literature Review on Forest Management Effects on Riparian Function for Anadromous Salmonids" is posted at: http://www.bof.fire.ca.gov/pdfs/FINALBOOK_1.pdf. Additionally, the Board Staff Report on the project, including the Technical Advisory Committee (TAC) riparian function primers, is posted at: http://www.bof.fire.ca.gov/pdfs/BOFStaffReportFinal_100908.pdf.

George stated that a three-member CAL FIRE group has been charged by the Board to prepare an initial set of proposed changes to the T/I Rules based on the SWC review and other scientific information. **A draft concept paper for potential changes for Class I watercourse was handed out for discussion at the December Board Forest Practice Committee meetings in Sacramento. A revised concept paper will be posted on the Board of Forestry and Fire Protection's webpage in late December.**

FORPRIEM Monitoring Program Update

Clay Brandow, CAL FIRE, provided a brief update on the FORPRIEM monitoring program. Clay reported that all CAL FIRE units have been trained on FORPRIEM monitoring protocols except the San Mateo-Santa Cruz Unit. Additionally, CAL FIRE IT staff have produced an operational database for storing and querying FORPRIEM data. To date, Clay has received 21 monitoring forms for completed THPs. Nine have come from CAL FIRE Region 1, 9 from Region 4, and 3 from Region 2. He will be entering the data into the database over the next few months. Clay expects to receive approximately 30-40 monitoring forms per year based on a 10% random sample, and that 100 monitoring forms will be needed before a second Monitoring Completion Report/FORPRIEM report can be generated by CAL FIRE staff (roughly 3 years).

Next MSG Meeting

No meeting date or location was selected for the next MSG meeting. It is anticipated that the next meeting will be held in February or March. **The date, location, and agenda for the next meeting will be emailed to the MSG as soon as this information is available.**