

Monitoring Study Group Meeting Minutes

December 10, 2013

CAL FIRE Shasta-Trinity Unit Headquarters, Redding

The following people attended the MSG meeting: George Gentry (BOF—MSG Chair), Clay Brandow, (CAL FIRE), Nick Kunz (SWRCB), Peter Ribar (CTM), David Fowler (NCRWQCB), Dr. Russ Henly (Natural Resources Agency), Richard Gienger (NGO), Dr. Michael Wopat (CGS-retired), Bill Condon (DFW), Bryan McFadin (NCRWQCB), Jaqueline Matthews (CVRWQCB), Steven Cordes (DFW), David Whitley (CVRWQCB), Griffin Perea (CVRWQCB), Debra Hallis (CVRWQCB), Shane Edmunds (CVRWQCB), Ryan DeSantis (UCCE), Bill Short (CGS), Stuart Farber (WM Beaty), Chantz Joyce (Stewardship Council), Drew Coe (CVRWQCB), Rich Klug (Roseburg Resources), Dr. Lowell Diller (GDRCo), Dr. Cajun James (SPI), Marily Woodhouse (Battle Creek Alliance), and Pete Cafferata (CAL FIRE).

Participants on the GoToMeeting webinar/conference call included: Fred Blatt (NCRWQCB), Jeanette Pedersen (CAL FIRE), Mike Laing (NCCFFF), Pam Linstedt (CAL FIRE), Susan Robinson (Ebetts Pass Forest Watch), Sue Sniado (DFW), Terra Fuller (DFW), Joe Croteau (DFW), Ed Struffenegger (CFA), Matt House (GDRCo), Susan Keydel (USEPA), Dr. Helge Eng (CAL FIRE), Bob Hawkins (DFW), Drew Loganbill (NRCS), Mary Olswang (DFW), Brad Valentine (DFW), and Maggie Robinson (NCRWQCB). **[Action items are shown in bold print].**

The meeting began with general monitoring-related announcements:

- Designing, Improving, and Maintaining Rural Roads Workshop, December 13, 2013, Jamestown, CA. The Rural Roads Webinar Series recordings, covering similar material in greater detail, are available at: http://ucanr.org/sites/forestry/Webinars/Rural_Roads_Webinar_Series/.
- California Licensed Foresters Association (CLFA). Spring Workshop on roads, March 6, 2014, at the Lions Gate Hotel in Sacramento. More information will be posted at: <http://www.clfa.org/>.
- Northern California and Southern California Society of American Foresters (SAF) 2014 Winter Meeting, January 25–26, 2014, Berkeley, CA. “One California Forestry: The Professional’s Role.” Registration information is provided in the following document: http://norcalsaf.org/temparticles/Newsletters/2013_fall_web.pdf.
- Webinar series on Reforestation and Afforestation Practices for California; 9 sessions beginning January 8, 2014, on consecutive Wednesdays from 11:00 a.m. - 1:00 p.m. Register at: <http://ucanr.edu/sites/forestry/Webinars/Reforestation/>. Contact Dr. Richard Harris, rrharris2464@sbcglobal.net, or Susie Kocher, sdkocher@ucanr.edu, for more information.
- The 35th annual Forest Vegetation Management Conference, “Fire Resilient Reforestation,” will be held January 14-16, at the Holiday Inn, Redding, CA. For more information and registration, see: <http://www.fvmc.org/>.
- State Board of Forestry and Fire Protection Meetings: A new schedule is in place for 2014; the first two meetings are: January 28-29 and March 4-5 (5-6 weeks between meetings in 2014). See: http://www.bof.fire.ca.gov/board_business/2014_board_meeting_dates/2014_schedule.pdf.
- Richard Gienger described a streambed restoration project being conducted on Baker Creek, a tributary of the Mattole River near Whitethorn, that is creating off-channel habitat for coho salmon and raising the surrounding water table to increase water flow year-round. Sam Flanagan, BLM Geologist, is working with Sanctuary Forest staff on this project. For more information, see:

http://www.redwoodtimes.com/garbervillenews/ci_21888480/blm-director-visits-lost-coast-and-baker-creek.

- Richard Gienger announced that the 32nd Annual Salmonid Restoration Conference will be held on March 19-22, 2014, in Santa Barbara, CA. See: <http://www.calsalmon.org/>. The 17th Annual Coho Confab will be held in August 2014; more information will be posted at: <http://www.calsalmon.org/training/coho-confabs>.

Green Diamond Resource Company's Riparian Canopy Density Experiment

Dr. Lowell Diller provided a PowerPoint presentation titled "Response of Forest Aquatic Ecosystems to Riparian Canopy Modifications." This presentation is posted on the MSG Archives website at: http://www.bof.fire.ca.gov/board_committees/monitoring_study_group/msg_archived_documents/msg_archived_documents/diller_bof_msg_canopy_density_experiment_12-10-13.pdf. Dr. Diller began by providing background information on the development of the riparian canopy density experiment, which has been occurring for the past five years. The study has been made feasible due to (1) Green Diamond Resource Company's aquatic HCP, allowing for experimental watersheds and incidental take, and (2) the need for pilot projects to demonstrate the use of Anadromous Salmonid Protection (ASP) rule 14 CCR § 916.9 (v), allowing for site-specific riparian protection measures. This experiment is one of the three VTAC pilot projects under various stages of development.

The list of scientists involved in this large research effort includes Dr. Peggy Wilzbach, Cooperative Fish Unit, HSU; Dr. Brett Harvey, USFS PSW; Dr. Gordie Reeves, USFS PSW; Dr. Ken Cummins, private consultant; Dr. Lee Benda, Earth Systems Institute; Dr. Caren Goldberg, WSU; and Dr. Trent McDonald, statistician, WEST, Inc. A final study plan for agency review is nearing completion. A PhD student working under Dr. Reeves will be added to the project in the near future.

Riparian functions were briefly summarized and historical timber harvesting practices were described as being highly disruptive on aquatic ecosystems. Forest practice regulations, beginning in the 1970's, have mandated uniform buffer strips along watercourses with increasing canopy requirements, attempting to generate dark, heavily shaded conditions. Dr. Diller illustrated this concept with a photo from the Little Creek watershed. The factors limiting stream productivity were then listed, including hydrology, habitat/LWD, water temperature, nutrients, and sunlight. Sunlight was described as possibly being the most limiting in small forested PNW streams. A detailed diagram showing watershed interactions was displayed, illustrating a pathway suggesting that reduced riparian vegetation produces more light/heat, which increases primary production, which in turn leads to greater macroinvertebrate and amphibian production, downstream export, and ultimately fish production. An "intermediate recovery stage" following a large fire has been hypothesized as being the most productive by Dr. Reeves.

Dr. Diller then described the reach-scale experiment carried out by Wilzbach et al. 2005, which evaluated the effects of riparian canopy openings and addition of salmon carcasses on biomass, density and growth rates of juvenile salmonids in SF Rowdy, Savoy, Little Mill, Peacock, Tarup and Tectah Creeks. All hardwoods were removed along 100 m reaches, while on the same stream, second 100 m control reaches with an intact canopy were left in place. Cutthroat and rainbow trout were found to respond positively to canopy removal but there was no measureable effect from carcass additions. Very minor impacts on water temperature were recorded (~1°C).

Only a few similar watershed-scale experiments have taken place in the PNW. Using a BACI design, MacCracken et al. (in review) manipulated vegetation cover, retaining ~ 0%, 30%, and 70% canopy on 50 m treatment reaches separated by >50 m, with a paired reference reach where cover was near 100%. The study took place in 2004-2007 in 26 headwater streams in NW Oregon and western Washington. They concluded that intermediate levels of canopy openings appear to be either benign or beneficial for most taxa, as long as other potential stressors (increased fine sediment delivery or water temperature) are minimized. They documented a 2-4°C increase in water temperature (max and 7-day moving mean) in the lowest canopy retention levels, but did not detect any obvious negative effects on any taxa (i.e., increases exceeded regulatory thresholds). The Washington DNR "type N" experimental buffer treatment study (Hayes et al., in progress), testing the Forests & Fish regulations, was also briefly

explained. Using a BACI design, treatments included: no buffer, a Forest & Fish Rules (FFR) buffer (50% of the stream has a 50' buffer), a full 50' buffer stream, and an unharvested reference site. There were four experimental treatments and five replicates per treatment for a total of 20 sites. The response of amphibians is being evaluated with results forthcoming. Dr. Diller and other GDRCo scientists visited several of the sites for both studies and found them to be considerably different than coast redwood watersheds in northwestern California, with the reference reaches providing much less shading.

The new GDRCo experiment documenting the response of aquatic ecosystems to riparian canopy modification will start with a stream-reach approach (similar to that used by Wilzbach et al. 2005) on a single stream and transition into a watershed-level study. The study is designed to evaluate the response in terms of growth and abundance of selected key aquatic organisms, including juvenile salmonids, coastal giant salamanders, and macro-invertebrates to modifications of the riparian canopy. NetMap will be used to guide the type, extent, and spatial distribution of canopy manipulations that are likely to have positive benefits to the selected aquatic organisms without causing adverse impacts to other aquatic resources. If deemed necessary, potential future losses in wood recruitment will be mitigated by tipping trees into the treated streams following completion of the study. For headwater reaches, abundance and growth of giant salamanders will be the primary biological response variable. The team will also monitor distribution and occupancy using eDNA (see: <http://ednasolutions.net/FAQs.html>) and population genetics (i.e., changes in effective population size and genetic connectivity) of coastal tailed frogs and southern torrent salamanders. For fish-bearing reaches, they will estimate the abundance and growth of juvenile salmonids and larval coastal giant salamanders through capture, PIT-tagging, and recapture. Macro-invertebrate functional groups will be estimated by food habits of fish and giant salamanders. Physical response variables include water temperature, suspended sediment, large wood, and primary production (estimated directly through changes in dissolved oxygen levels).

The study area includes four small tributary watersheds in the lower Klamath River basin: Tarup Creek (4038 ac), Mainstem Ah Pah Creek (4280 ac), SF Ah Pah Creek (1587 ac), and Little Surpur Creek (1925 ac). Dr. McDonald has stated that there is no such thing as a control-treatment match, since all locations along a stream are different. Therefore, the experimental design specifies treated, untreated, and excluded areas. A BAS (balanced acceptance sample, Robertson et al. 2013) will be taken for all reaches not excluded for logistical or environmental reasons. Biological and physical parameters will be measured for all reaches, but only half of the selected BAS reaches will be treated. Assuming no environmental concerns arise from the single stream experiment, the same experimental design will be expanded to all four watersheds. Little Surpur Creek will have GDRCo's normal AHCP timber harvesting but no riparian treatments. Technically it will not be a "control", but it will provide a baseline for physical and biological parameters. This study can be described as using "repeated measures with a randomized complete block design at the reach level." The goal is to increase solar radiation similar to achieved by Wilzbach et al. (2005), but using techniques applicable to current timber management practice. Treatments will vary from 200 m with 50-60% canopy removal (thinning) in the lower reaches to 50 m with the same removal rate in the upper reaches. NetMap will be used to minimize the loss of potential large wood, thermal loading, and sediment generation. Mainly red alder will be cut in the lower reaches, a mixture of conifers and hardwoods in the mid-reaches, and mostly conifers in the upper headwater reaches. Harvested conifers will be used to help fund this 10 year study.

The goal is to have the refined NetMap model resulting from the experiment allow for application of the experimental results to other areas where canopy modifications would likely be beneficial to the aquatic ecosystem (i.e., NetMap will be the tool to transport results to other areas). The study schedule calls for initial pre-treatment data to be collected during 2012-13, the first SF Ah Pah treatments implemented in 2014; expansion of treatments in SF and mainstem Ah Pah during 2015-17, and completion of the treatments in 2018-22. It is likely that it will be 2024 before the results can be used to make management recommendations. Dr. Diller stated that if the results are positive, future management of riparian forests in coastal redwood forests and potentially other areas will include active management to maintain some proportion of openings.

Alternative WLPZs in Anadromous Salmonid Watersheds

Stu Farber provided a PowerPoint presentation titled "Alternative WLPZs in Anadromous Salmonid Watersheds." This PPT, the monitoring reports for Etna and McKinney Creeks, and supporting THP information for both projects are posted on the Monitoring Study Group Archives website at: http://www.bof.fire.ca.gov/board_committees/monitoring_study_group/msg_archived_documents/. The work was completed on Michigan-California timberlands in 2006 with Jenny Whitaker. Mr. Farber began the talk by stating that these were small scale "cause and effect studies," different than long-term projects such as being conducted at Caspar Creek and Judd Creek.

Background information on the Etna Creek study area was provided. The Etna Creek watershed is a 17,106 ac tributary of the Scott River, mainly composed of decomposed granite. Chinook and coho salmon are found in the watershed, with steelhead in the study area. Mr. Farber and Ms. Whitaker worked cooperatively with CAL FIRE, DFW, and NCRWQCB staff on this BACI (Before-After-Control-Impact) study. Water temperature data collection began in 1997. Maximum Weekly Average Temperatures (MWATs) range from 12.9°C to 14.7°C from 1997 to 2006. Slow natural warming is observed as water travels downstream from an elevation of 5440 ft to 3410 ft. Wood budget work for Class I and II watercourses showed that 80% and 90% of total identifiable LWD came from 50 ft from the stream channel, respectively.

The proposed alternative WLPZ practices in the Etna Creek watershed were:

- Class I Selection Unit WLPZ = no harvest for 0 to 50 ft and 50% canopy closure for 50 to 150 ft.
- Class I Clearcut Unit WLPZ = no harvest for 0 to 75 ft and 50% canopy closure for 75 to 150 ft.
- Class II WLPZ = 70% canopy cover for 0 to 25 ft; 50% canopy closure for 25 to 100 ft.

Monitoring was specified to occur for one year before treatment and two years post treatment. The before-and-after design included two Class I stream reaches and the before-after-control design included four Class II stream reaches with four control reaches. Canopy was measured every 100 ft with a spherical densiometer and a sighting tube (61 Class I segments and 124 Class II segments). Sediment transport was documented qualitatively pre and post harvest.

Results for the Class I WLPZ thinning unit showed that canopy closures (outer zone) were: 83% reduced to 73% (densiometer), and 72% reduced to 53% (siting tube). Relative to the control, the inner zone air temperature decreased 0.5°C, while the outer zone air temperature increased 0.3°C. Relative to the control, the inner zone relative humidity (RH) increased 5.3%; outer zone RH decreased 1.4%. Approximately one-quarter to one-third of the volume was removed in the WLPZ. Results for the Class I WLPZ clearcut unit showed that post harvest canopy closures were: 84% reduced to 53% (densiometer), and 67% reduced to 53% (siting tube). Relative to the control, the inner zone air temperature decreased 0.3°C, while the outer zone air temperature increased 1.0°C. Inner zone RH could not be determined (bear damage); relative to the control, outer zone RH decreased 9.0%. MWAT water temperature remained relatively unchanged from the Class I alternative WLPZ timber harvest practices.

Results for the Class II WLPZ thinning unit showed that canopy closures (outer zone) were: 83% reduced to 75% (densiometer), and 70% reduced to 62% (siting tube). The outer zone air temperature decreased 0.2°C; outer zone RH decreased 14.1%. Control reach outer zone air temperature decreased 1.6°C; outer zone RH decreased 9.1%. Relative to the control, the outer zone air temperature increased 1.5°C and the RH decreased 5.0%. Inner zone air temperature increased 1.1°C and RH decreased 4.6%. Water temperatures remained relatively unchanged, even though air temperature increased and RH decreased relative to the controls. Sediment transport to the WLPZs from roads, skid trails, or harvest units was found to have been stopped by placement of waterbars and slash over all skid trails and landings.

The McKinney Creek watershed is a 7,289 ac tributary of the Klamath River with metamorphic and granitic geology. Chinook salmon and steelhead are found in the watershed, with native trout in the study area. As with the Etna Creek study, Mr. Farber and Ms. Whitaker worked cooperatively with CAL FIRE, DFW, and NCRWQCB staff on this small scale Before-After study. Considerable logging took place in

the watershed around 1964. Water temperature data have been collected since 1997. Wood budget work showed that 94% of total identifiable LWD came from 50 ft from the stream channel. Canopy closure and sediment delivery methods were similar to those described above for Etna Creek, but only Class I WLPZs were studied. Flow in McKinney Creek is not spring fed, generating widely varying streamflows for wet and dry years. The proposed alternative Class I WLPZ was to maintain 100% of the existing canopy closure from 0 to 50 feet from the bankfull width and 50% canopy closure from 50 to 150 feet. Timber harvesting occurred during the fall of 2007, following the peak of summer water temperature, and 2008 was the first post harvest water year. Results for the Class I WLPZ thinning unit showed that canopy closures (outer zone) were: 84% reduced to 73% (densiometer), and 67% reduced to 53% (siting tube). MWATs decreased in 2008 and increased in 2009, related to local changes in streamflows and air temperature. Sediment transport to the WLPZ was stopped by waterbars and slash treatments over all of the skid trails and landings, similar to that observed for the Etna Creek study.

Mr. Farber concluded by stating that the results indicate that the alternative WLPZ prescriptions for these two study areas in Siskiyou County were effective in maintaining stream temperatures and trapping surface erosion. Due to the limited sample size and geographic areas studied, he cautioned that generalization the results should be limited to similar geomorphic and ecological conditions.

AB 1492 Implementation and the Effectiveness Monitoring Committee

Dr. Russ Henly, Natural Resources Agency Assistant Secretary of Forest Resources Management, gave a presentation on AB 1492 implementation and how the Board approved Effectiveness Monitoring Committee can support the ecological performance monitoring component. Dr. Henly began by providing background information on AB 1492, which established the Timber Regulation and Forest Restoration (TRFR) Fund in the State Treasury by imposing a new assessment on lumber products (1%), and extended the life of THPs to five years (with extensions of up to two additional years). The bill requires the Secretary of the Natural Resources Agency annually to submit a report on January 10th to the Joint Legislative Budget Committee on the activities of all state departments, agencies and boards relating to forest and timberland regulation (a one-time policy level report is also due in April 2014). In addition to detailed information on THPs and the regulatory programs reviewing THPs, this report is to provide an evaluation of ecological performance. Restoration activities can use TRFR funds, but no money has been allocated for this purpose to date. This will likely include CAL FIRE's CFIP and Urban Forestry programs, as well as support for fuel treatment grants.

Dr. Henly described (and illustrated with a handout) the "AB 1492 Triangle," which shows the main goals of the bill—how this new funding source will allow the state agencies to do a better job of reviewing commercial logging plans. The three sides of the triangle are: (1) administrative transparency and efficiency, (2) environmental data assembly and sharing, and (3) ecological performance measures. Forty-nine new positions for the Review Team agencies were established, 35 of which were assigned to DFW. Positions primarily responsible for plan review are now funded from TRFR, not the state general fund. AB 1492 allows for the agencies to be adequately staffed, the public to have better access to THP-related data, and the THP-review process to operate more efficiently. The Review Team agencies will be building on the process developed by the Redding Pilot Project to improve THP review efficiency. The Interagency Timber Harvest Data Management Working Group, chaired by Nick Kunz (SWRCB), has been established to simplify the collection and use of THP-related data among all the agencies, and Dr. Henly is developing a charter for the group.

Ecological performance measures were included in the bill to provide assurances to the public that the resources are being adequately protected. No specific measures have been specified to date. **Public input, including MSG input, is required to help develop this part of the bill's requirements.** The Board of Forestry and Fire Protection's approved charter authorizing formation of the Effectiveness Monitoring Committee (EMC) was described as being a key component for meeting the ecological performance monitoring requirements. In addition to studying the effectiveness of the Forest Practice Rules, regulations from the other Review Team agencies will be included (e.g., ESA, GWDR, Conditional Waivers, etc.). **George Gentry will begin the solicitation process for EMC members in very near**

future (likely by mid-January). Mr. Gentry stated that the chairs of the committee will be Stu Farber, Chair of the BOF's Management Committee, and Dr. Henly. Nick Kunz, Bill Condon (DFW), and Bill Short (CGS) provided short statements indicating their agency's support for moving ahead with the mandates of AB 1492. Richard Gienger stated that it should be clear that pilot projects, on real planning watersheds with real multi-stakeholder and multidisciplinary participation, are an essential and viable method to really establish what efficiencies and ecological performance are possible and needed in California Forest Practices, and is the approach he would favor, rather than the EMC.

FORPRIEM (Forest Practice Rules Implementation and Effectiveness Monitoring) Watercourse Crossing Update

Clay Brandow, CAL FIRE, provided a short PowerPoint presentation titled "FORPRIEM Watercourse Crossing Monitoring Data." Mr. Brandow stated that at the last MSG meeting, FORPRIEM WLPZ canopy was presented, and that crossing data would be covered at this meeting. **All the data on canopy, roads, and crossings from approximately 120 THPs and 22 NTMP-NTOs will be entered into the FORPRIEM database by December 31st, with data analysis occurring in January, and a draft monitoring report to be finished by February 28, 2014.** A QA/QC resampling of approximately 5% of THPs took place in 2013, which has yielded very similar results for both WLPZ canopy and crossing data. The QA/QC program also included field training for CAL FIRE Forest Practice Inspectors.

Randomly selected FORPRIEM plans have two randomly located watercourse crossings sampled, both of which are rated for implementation and effectiveness after at least one overwintering period. There are data on 188 crossings from THPs in the database, 70% of which are culverts, 21% fords, 2% bridges, and 7% other types. Approximately 90% are existing crossings and 10% abandoned. The vast majority are associated with seasonal roads. Five percent of the culvert crossings were found to have diversion potential, which suggests improvement over earlier monitoring results reported in 2002 and 2006 (9-10%). Scour at the outlet of culverts and inadequate cut-off drainage structures were documented for 3% of the crossings. For NTMP-NTOs, there are data on 33 crossings in the database. Approximately 65% are culverts, 25% fords, and 10% other types. Diversion potential was documented for 11% of the culvert crossings, but the sample size is small. Plugging, scour at the outlet, and fillslope failures were recorded for 5%, 5%, and 6% of the crossings, respectively. In summary, diversion potential appears to be improving over time for THP culvert crossings, and NTMP-NTO crossings appear to have slightly higher rates of effectiveness problems, but the sample size is small.

Update on the Anadromous Salmonid Protection (ASP) Rule—Section V Pilot Projects

Pete Cafferata provided a short update on the ASP Rule section V pilot projects. The Green Diamond Resource Company pilot project update is described above. The Campbell Timberland Management (CTM) THP project (Mill-Smith THP) that will be felling up to 30 coast redwood, spruce, and alder trees at six sites along the Smith Creek channel to enhance large wood loading in a coho watercourse was approved by CAL FIRE on December 10th. CTM stipulated that they would include a Consistency Determination (CD) regarding incidental take from DFW in the plan prior to approval, and the CD was approved on December 9, 2013, allowing CAL FIRE to approve the THP. The LaTour Demonstration State Forest proposal to reduce catastrophic wildfire risk in two areas along South Cow Creek by establishing group openings and using single tree selection between group selection units is still being finalized. **The proposal in the lower reach of South Cow Creek is a planned amendment to the existing Cabled Cow THP (2-12-061 SHA). Forest manager Dave Loveless has stated that the THP amendment will be submitted in late 2013 or early 2014.**

New and Unfinished Business/Public Comment

Nick Kunz provided a short PowerPoint presentation on the SWRCB's Forest Activities Program. This included an overview of the program, a brief overview of past nonpoint source plan initiatives related to silviculture, and the proposed State Board forestry initiatives for the Nonpoint Source Program Plan update. Proposed initiatives for the nonpoint source five-year update include: (1) facilitate program

reporting and data exchange, (2) support Regional program initiatives through data management improvements, (3) integrate appropriate assessment tools for use in performance measures, and (4) develop and support ongoing training opportunities tailored to particular needs and interest of agency staff, foresters, and the public at large. **This is an ongoing process, with a March presentation to the SWRCB planned. Mr. Kunz stated that he welcomes comments or questions on the five-year update; contact him at Nicholas.Kunz@waterboards.ca.gov or (916) 341-5566.**

Next Monitoring Study Group Meeting Date

The next MSG meeting date is tentatively planned for March 2014, with the location to be either Willits or Ukiah. When a definite date, venue, and agenda are available, this information will be emailed to the MSG contact list.