# BOF Effectiveness Monitoring Committee Meeting Notes
# June 16, 2020

## GoToMeeting Webinar

**1. Participants (26):**

Members--Sue Husari (Co-Chair), Loretta Moreno (Co-Chair), Sal Chinnici, Dr. Matt O'Connor, Matt House, Dr. Leander Anderegg, Dr. Peter Freer-Smith, Jim Burke, Dr. Stacy Drury, Bill Short, Drew Coe, Justin LaNier, Elliot Chasin, Cliff Harvey

Staff—Brandi Goss, Stacy Stanish, Dave Fowler, Pete Cafferata

Participants—Dr. Michael Baker, Will Olsen, Richard Gienger, Steve Baumgartner, Katie Harrell, Cheryl Hayhurst, Dr. Chris Surfleet, Tim Ryan

**2. Report by the Co-Chairs**

a. **Monitoring News**:

-- Loretta Moreno announced that AB 1492 Ecological Performance Measures (EPM) monitoring is aligning with the requirements for AB 2551, which directs the CNRA and CalEPA to develop a plan for forest and watershed restoration investments to improve watershed function and resilience in the area that supplies Shasta, Oroville, and Trinity reservoirs.

b. **EMC Membership Renewals**:

-- Sue Husari stated that all the EMC membership renewals have been completed.

c. **EMC Projects Status and Funding Changes due to COVID-19**:

-- Sue Husari stated that funding for new EMC projects in FY 2020 (~$157,000) will not be available, but that funding previously committed to EMC projects will be available (~$268,000). No request for proposals will be advertised for the fiscal year starting July 1st. **Brandi Goss will post a notice on the EMC webpage that there will not be a request for proposals for FY 2020, and send an announcement to the BOF email list (following CNRA approval). Additionally, Ms. Goss will contact the current EMC contractors to reaffirm that they will receive the funding previously committed for their projects.**

d. **EMC Staffing Changes**:

-- Chair Husari announced that Brandi Goss, lead staff for the EMC, will commence working on a Master of Science degree with the Graduate Group in Ecology at UC Davis, beginning in mid-September. The EMC thanks Brandi for her work staffing the committee. Katie Harrell, BOF staff, has agreed to assist the EMC until a vacant Environmental Scientist position is filled.

e) **Other Pertinent Updates**:

-- Drew Coe announced that Drs. Kevin Bladon and Catalina Segura, Oregon State University, are very close to submitting a manuscript for publication in a peer reviewed journal from the work completed for the EMC funded Class II-Large Monitoring Study, *Regional Effectiveness of Rules for Class II-L Watercourse Identification* (EMC-2015-001). Mr. Coe also stated that a second manuscript from the Boggs Mountain Demonstration State Forest post-fire runoff and erosion study (EMC-2016-002) has been submitted to Hydrological Processes, titled "*Compaction and cover effects on runoff and erosion in post-fire salvage logged areas in the Valley wildfire, California*."

– Matt House stated that the EMC project titled "*Effectiveness of the Class II WLPZ FPRs and Aquatic Habitat Conservation Plan (AHCP) Class II riparian prescriptions at maintaining or restoring canopy closure, stream water temperature, and primary productivity"* (EMC-2018-006) continues to move forward in spite of COVID-19 concerns. Green Diamond Resource Company staff are conducting field

work when OSU graduate students are not available. Pre-harvest data were collected in 2019 and timber harvesting is occurring this year.

-- Brandi Goss reports that EMC 2019-002 (*Treatment Longevity for Fuel Reduction Projects*); EMC 2019-005 (*Sediment Monitoring and Fish Habitat--with Accelerated Wood Recruitment*); and EMC 2019-003 (*Fuel treatments and Hydrologic Implications in the Sierra Nevada*) are in the final stages of contract approval by CAL FIRE's Business Services Office.

**3. Presentation from Dr. Chris Surfleet on Project Progress**

Dr. Chris Surfleet, Cal Poly San Luis Obispo, provided PowerPoint presentations on (1) a CAL FIRE contract titled *"Evaluation of Hydrologic and Water Quality Changes Associated with Differing Silvicultural Treatments, Road Practices, and Riparian Buffer Strip Design Implemented under the California Forest Practice Rules using the Distributed Hydrology Soil Vegetation Model (DHSVM) at the Caspar Creek Experimental Watersheds,"* and (2) *EMC-2018-003--Alternative Meadow Restoration.*

The DHSVM project is part of a suite of 11 studies being conducted as the Phase III Experiment at the Caspar Creek Experimental Watersheds.[1] This study was split into two components—(1) modeling forest road scenarios and impacts of suspended sediment, and (2) modeling streamside buffers and harvest on stream temperatures. The forest road study included a field component, with 16 road flumes installed during the winter of 2018-19. Six of the flumes were outfitted with automated equipment to measure runoff, turbidity, and suspended sediment concentration (SSC), while the other 10 measured runoff with simple crest stage gages. Turbidity and stage were also measured above and below two watercourse crossings. Data were collected on 22 road runoff events at the outlets of road drainage structures (e.g., rolling dips, waterbars). The best regression models to predict sediment yields used storm peak flow, turbidity, and either road surface type or cutslope cover. Road dimensions (length, width, area, slope) did not improve the models. Rocked road segments produced 0.01-0.85 kg/m$^2$/yr, vs. native surface roads at 17.8-41.0 kg/m$^2$/yr. Barrett et al. (2012) measured similar sediment values for rocked roads in the Caspar Creek watershed, but much lower values for older, less trafficked native surfaced roads elsewhere on Jackson Demonstration State Forest.

The DHSVM model was used to make extrapolations using the field road data to the larger South Fork Caspar Creek watershed (SFC). DHSVM was calibrated to SFC streamflow with Monte Carlo simulations (10,000) for hydrologic years 2015-2018. A range of precipitation multipliers (0.7-1.1) and soil hydraulic parameters were used to obtain reasonable model outputs. DHSVM includes a road modeling component, and calibration was based on trial and error adjustments of road length, width, infiltration rate, and cutslope height. Five sets of road forest practice rules (FPRs) and road network scenarios were modeled: existing road FPRs with the 2018 road network, and with the 1960s-early 1970s road network; Pre-2010 road FPRs with the 2018 road network, and the 1960s-early 1970s road network; and pre-modern FPRs with the 1960s-early 1970s road network. Average road segment length and percentage of road length within 200 feet of a watercourse varied greatly with these scenarios. Regression equations were generated to predict suspended sediment load based on simulated peak flows (low, moderate, and high) for both the SFC watershed and the small headwater Ziemer tributary.

[1] The Phase III Experiment amended study plan for the South Fork of Caspar Creek is posted at: https://www.fs.fed.us/psw/topics/water/caspar/documents/CasparCreekStudyPlanAddendum_20180228.pdf

Modeling results showed that the modern road network placed on the upper slopes and ridges of the SFC, with few watercourse crossings and implemented with the current FPRs, was very effective in reducing peak flows and suspended sediment inputs. Estimates of suspended sediment load and peak flows increased as the different road scenarios that had longer spacing between road drainage structures were simulated. The modeling results indicate that hydrological disconnection of road networks, as required in the current FPRs, will decrease impacts on suspended sediment loads and peak flows. However, even with attempts at hydrologic disconnection, a road network with a high proportion of streamside roads was found to still significantly contribute to cumulative watershed effects. Dr. Surfleet has submitted a draft report on this project that is currently under review by CAL FIRE and USFS PSW staff. A second draft is expected to be available in July.

The second part of Dr. Surfleet's DHSVM modeling presentation was based on Julie Ridgeway's completed MS thesis titled "*An Analysis of Changes in Stream Temperature due to Forest Harvest Practices using DHSVM-RBM*" (https://digitalcommons.calpoly.edu/theses/2093/). DHSVM was used for the hydrology inputs in SFC, while the River Basin Model (RBM) was used to route heat through the watershed to estimate water temperature changes. RBM allows long and shortwave solar radiation to be modified by topography and vegetation along stream channels, producing an estimate of the percentage of channel exposure to solar radiation input. Historic data were used to calibrate DHSVM and RBM to measured stream temperatures in SFC. The models were calibrated for climate inputs from 2011-13 and validated with data from 2014-16. Modeling scenarios evaluated were (1) varying percentages of WLPZ canopy cover, (2) the 2018-2019 SFC Phase III forest harvest, (3) an experimental design removing riparian vegetation along 300-yard stream reaches, (4) clearcutting the entire watershed, and (5) old-growth watershed conditions. A primary limitation for this study was the inability to differentiate between inner, outer and core riparian zones required by the ASP FPRs. This required simplification of the true design of WLPZs used in the FPRs and limited the ability of the model to analyze the current FPRs. Changes in Maximum Weekly Maximum Temperature (MWMT) and Maximum Weekly Average Temperature (MWAT) values were modeled.

Modeling results showed that substantial changes in stream temperatures only occurred when buffer strip canopy was reduced to 25 and 0% retention levels. Larger increases in MWMT, compared to MWAT values, were seen across all scenarios. The 2018-2019 Phase III Experiment harvest showed very small temperature impacts, with average increases in MWAT and MWMT values of 0.1°C and 0.3°C, respectively. The RBM was found to do a poor job of routing heated water downstream, so temperature changes associated with the 300-yard riparian conversion reaches were not reliable. Clearcutting the entire SFC watershed produced less of an effect than simulations clearing only the riparian area, suggesting that decreases in evapotranspiration and increases in water yield could mitigate stream temperature increases. Additional sensitivity analyses using much warmer air temperatures showed that tree height and the monthly extinction coefficient (a function of leaf area index) had the most influence on stream temperature changes in SFC. This suggests stream temperature management focus should be placed on maintaining tall, dense buffers. Overall, this modeling work showed that the current FPRs adequately maintain pre-harvest water temperatures following a modern timber harvest.

The CAL FIRE contract funds have been spent and the contract expires June 30, 2020. Dr. Surfleet is working to turn both the temperature thesis and road sediment modeling report into manuscripts for publication this summer.

*EMC-2018-003--Alternative Meadow Restoration Update*

Dr. Surfleet also provided a PowerPoint presentation on the Alternative Meadow Restoration project funded by the EMC. This work is addressing the problem of decreasing meadow habitat in the Sierra Nevada and Cascade Range due to encroachment of conifers with fire suppression, changes in local hydrology/over grazing, and climate change. FPR 14 CCR § 933.4(e) allows for aspen stands, meadows, and wet areas to be harvested to restore, retain, or enhance ecological or range values. Primary objectives of the study at Childs and Rock Creek meadows in Plumas County are to (1) quantify hydrologic response from lodgepole pine removal, (2) determine if water quality is affected (temperature and sediment), (3) quantify the amount of soil disturbance and compaction within WLPZs following meadow restoration, and (4) determine the response of the vegetation communities following restoration.

This is a three year study using a BACI approach. Hydrologic response at Rock Creek and Childs meadows is being measured with groundwater wells and soil moisture sensors, while transpiration is being documented with sap flow meters on lodgepole pine trees. Electrical Resistivity Tomography (ERT) is being used to determine groundwater levels and locate the confining layer of the meadow aquifers. Vegetation response is being documented with transects, with 10 1-m plots per transect. Stream condition measurements include flow, water temperature above and below the treatment area, pool-riffle percentage and residual pool depths, particle size distribution, and cobble embeddedness. Four randomly selected transects are used for documenting soil disturbance and compaction. Lodgepole pine removal will occur this fall with a Collins Pine Company THP. There are two years (2 winters, 1 summer) of work remaining; project funding runs through June 30, 2022.

Dr. Surfleet also briefly described five years of post-restoration data from nearby Marian Meadow. Pre-restoration calibration work occurred from 2014-15, and post-restoration monitoring has taken place to 2020. Lodgepole pine were removed from the meadow, and a minor amount (9%) of mixed conifer were removed from the adjacent upslope area. There was an increase in volumetric soil moisture during the wet season, but a decrease during the dry season, and an average decrease in depth to groundwater of six inches. Additionally, days with groundwater levels within rooting depths of meadow vegetation increased, and the cost of removal was found to be at the low end of the range of the plug and pond restoration technique. These results are described in Noël Fie's Cal Poly MS thesis and in Surfleet et al. (2020):
https://digitalcommons.calpoly.edu/cgi/viewcontent.cgi?article=3186&context=theses
https://www.researchgate.net/publication/338735502_Hydrologic_Response_of_a_Montane_Meadow_from_Conifer_Removal_and_Upslope_Forest_Thinning

**4. Consideration of Amendments to Project Solicitation Process**

Loretta Moreno briefly summarizing what was discussed at the last EMC meeting regarding improving the EMC project selection process, and the next steps that are needed to accomplish this goal. These steps include (1) selecting specific topics to focus on from the EMC's Strategic Plan themes/critical questions and the BOF's priority topics, and (2) completing a detailed literature review for the selected topics. This approach was described as a valuable way for the EMC to move forward while there is a lack of funding for new EMC projects. The literature reviews would be conducted by EMC members and staff

with the appropriate expertise and background for the topics selected. There was broad agreement from the EMC that this is a valid approach to use moving forward. **Board staff will look for matches between EMC critical questions and BOF priorities, develop a table, and distribute it the EMC for discussion at the next meeting. EMC members will then be identified to conduct the literature reviews (subject to Bagley Keen Open Meeting Act limitations). Additionally, the table previously produced by Board staff showing where existing EMC projects address the EMC's critical questions will be updated and distributed to the EMC.**

**5. Discussion of Technical Sub-Group Formation**

Based on the discussion held above for agenda item no. 3, technical sub-groups will not be formed. Appropriate EMC members and staff will conduct the literature reviews for selected focus area topics.

There was further discussion on when to bring study results to the Board's Forest Practice Committee, using the adaptive management process, including utilizing the policy/rule modification (QA/QC) flowchart provided in the "Science to Policy Adaptive Management" PowerPoint presentation at the April EMC meeting. **Co-Chair Husari requested that Pete Cafferata ask Board EO Matt Dias when would be an appropriate time to bring Dr. Surfleet's Caspar Creek DHSVM modeling results to the Forest Practice Committee, as an informational item.**

**6. EMC Charter Revisions Discussion**

Brandi Goss summarized the EMC Charter revisions made since the April 2020 EMC meeting. These changes including shortening the section on the AB 1492/CNRA ecological performance measures (EPMs) relationship to the EMC, removing the large figure showing the relationship between the EMC and EPMs, suggested language for EMC co-chair appointments, adding language on funding proposals, and several smaller changes. Ms. Goss stated that BOF EO Dias informed her that it was not possible to have proxy voters for agency members not able to attend an EMC meeting.

Key decision points in the Charter were discussed. It was decided to:

- Retain Figure 1, Comparison between EMC (Board of Forestry) and EPM (CNRA) monitoring and assessment efforts under AB 1492.
- Remove "purpose" from the "purpose, goals, and objectives" section, and change "necessity" to "purpose" on page 1.
- Add "The role of the co-chairs is to provide leadership and coordination for the EMC" to briefly explain their duties.
- State that the co-chairs term is four years with the possibility of reappointment.
- **State that one of the co-chairs will be from either CalEPA (boards or departments under CalEPA) or CNRA (the Executive Branch or the agencies or boards under the CNRA), and the other co-chair may be any current member of the EMC. [Co-Chair Husari asked that this issue be highlighted for the Board]**

Pete Cafferata and Jim Burke provided additional small changes that were recorded by Ms. Goss.

Member Chinnici made the following motion, which was seconded by Member House:

Accept the EMC Charter as revised.

**The motion passed unanimously.**

**7. Public Forum** – None.

**8. Discussion of Future Meeting Locations, Dates, and Agenda Items**

The next EMC meeting will be held in September. This will likely be another remote meeting, but if it is held in person, it will take place in Sacramento. **Brandi Goss will send the EMC a Doodle poll to select a meeting date.**

**9. Announcements: Scientific Conferences, Symposiums, and Workshops**

Cliff Harvey stated that the USDA Forest Service is currently finalizing a publication describing several different meadow assessment methods, which should be available shortly.