BOF Effectiveness Monitoring Committee Meeting Notes
July 21, 2021

GoToMeeting Webinar

1. Participants (30):

Members--Sue Husari (Co-Chair), Loretta Moreno (Co-Chair), Sal Chinnici, Matt House, Dr. Matt O'Connor, Bill Short, Justin LaNier, Drew Coe, Jessica Leonard, Dr. Stacy Drury, and Dr. Leander Anderegg
Staff—Dr. Kristina Wolf and Pete Cafferata
Participants—Richard Gienger, Chris Faubion, George Gentry, Eric Hedge, Eric Huff, Will Olsen, Amanda Rhoades, Charles Schneider, Jane Van Susteren, Ben Waitman, Austin Wissler, Don Lindsay, Dr. Michael Baker, Dr. Kevin Bladon, Ronna Bowers, Roberta Lim, and Dr. Andy Stubblefield

2. Report by the Co-Chairs

a. Loretta Moreno stated that a Monitoring and Assessment Working Group has been formed by the California Wildfire and Forest Resilience Task Force in the last two months to develop a Forest Data Hub to serve as a multi-institutional information clearinghouse. Data will be input on fuels reduction treatment acres, as well as effectiveness of the treatments, expanding data sharing. This was a key action item from the California Wildfire and Forest Resilience Action Plan. Broader agency and public involvement will be available for the Hub (contact CAL FIRE's Kristen Merrill for information).
b. Loretta provided an update on the *AB 1492 Forest Ecosystem Monitoring and Assessment Initiative and AB 2551 Spatial Analysis and Priority Planning Project.* This ~1 million dollar contract for assessing 7 million acres draining to Shasta, Oroville, and Trinity reservoirs with UC Merced, UC Berkeley, UC Davis, UCCE, and the Univ. of New Mexico will help prioritize locations for vegetation treatments. Partners have engaged to select metrics, and public stakeholder workshops will be held in late summer and fall.
c. Sue Husari informed the EMC that the State Board of Forestry and Fire Protection is tentatively preparing to hold in person meetings beginning in September (COVID pending).

3. Virtual Field Tour with OSU's Researchers on the Class II-Large Study (EMC-2018-006) of the Effect of the Forest Practice Rules on Canopy Closure, Water Temperature, and Primary Productivity

Dr. Kevin Bladon, Oregon State University, provided a video and PowerPoint presentation on the Class II-Large Effectiveness Study (EMC-2018-006) being conducted on Green Diamond Resource Company (GDRC) timberlands in Humboldt County. There are 18 watersheds included in the study—six reference watersheds and four of each of the three riparian treatments. Treatment watersheds were all harvested in 2020 with one of the three treatments: (a) Coastal Anadromy Zone ASP Class II-L Prescription (30-ft core zone, 70-ft inner zone with 80% overstory canopy cover), (b) GDRC Habitat Conservation Plan Prescription (30-ft inner zone with 85% overstory canopy, 70-ft outer zone with 70% overstory canopy cover), or (c) an alternative prescription resembling pre-ASP (& Threatened or Impaired Watersheds (T/I) Rule Package) requirements (100-ft zone with 50% overstory canopy).

There are six circular 1/10 acre fixed-area plots in the riparian area of each watershed to quantify pre- and post-harvest tree condition, species, diameter at breast height (DBH), basal area, and canopy closure from hemispherical photographs. Stream discharge is being measured with salt solution gaging, and

dissolved oxygen (DO) and photosynthetically active radiation (PAR) data are also being recorded. Longitudinally along each of the 18 stream reaches (1,000 feet) there are four air temperature sensors and 12 stream temperature sensors (288 total sensors). Two centrally located meteorological stations are also maintained to quantify precipitation, air temperature, wind speed, soil moisture, and relative humidity. Additionally, 27 groundwater wells have been installed to document how water is routed to stream channels. All automated sensors have been set up to collect data at 15-minute intervals.

Pre-harvest mensuration data presented show that the three treatment sites and the controls are generally comparable when considering the mean number of trees per acre, basal area, canopy closure, and leaf area index (LAI). Annual precipitation was only approximately 50% of the long-term average during the winter of 2019-2020, but air temperatures were close to average. Stream discharge was similar in the reference and pre-ASP watersheds, but considerably lower in the ASP basins. Very limited flow response is expected due to the very low WLPZ harvest rates.

Preliminary stream temperature data show little evidence of discrete locations of groundwater discharge or spring inputs (i.e., stable temperature moving in a downstream direction). Plots of stream temperature for reference watersheds vs. ASP and HCP basins show no effect, while pre-ASP basins show a harvest effect, with increases of ~0.3^{o}C (0.5^{o}F). PAR data (radiation reaching the stream) show no treatment differences, except for pre-ASP basins, where increases of 244% have been documented. Mean chlorophyll-a concentrations are slightly elevated for all the treatment basins and the reference watersheds. Monthly water chemistry grab samples for nitrogen, phosphorus, and dissolved organic carbon (DOC) do not reveal large changes to date. Next steps include continued data collection and sampling, QA/QC and post-harvest data analyses, and publishing a stream temperature paper in early 2022 (Wissler) and a streamflow response paper in late 2022 (Nicholas). A post-doctoral researcher will start on the project in October 2021 to conduct longer term data analyses.

4. Presentation on the Railroad Gulch BMP Evaluation Study Conducted in the Elk River Watershed, Humboldt County

Dr. Andy Stubblefield, Humboldt State University (HSU), provided a PowerPoint presentation summarizing the final report he has written on the Railroad Gulch BMP Evaluation Study. This is a cooperative watershed study by HSU, Humboldt Redwood Company (HRC), and CAL FIRE that began in 2014. This study was designed to evaluate the effectiveness of HRC's Habitat Conservation Plan (HCP), the Forest Practice Rules (FPRs), and Elk River Watershed Analysis-derived prescriptions in minimizing sediment delivery to watercourses in response to timber harvest activities using effectiveness monitoring. The project utilized the 2012 McCloud-Shaw THP, which included harvesting in the East Branch of Railroad Gulch, and no harvest in the West Branch (i.e., a 7-year paired watershed THP effectiveness monitoring study). The East Branch had roads installed in summer 2015, and a selective harvest covering 39% of the East Branch was completed in summer 2016. Cable yarding was used, removing ~13,000 BF/ac.

Parameters documented included precipitation, turbidity storm sampling along the channels, tributaries, and above and below road-stream crossings, suspended sediment yield (annual and storm-based), streamflow, Be-10 isotope analysis for long-term (millennial scale) erosion rates, hillslope landslide and

small streamside landslide inventories, road-related erosion, annual channel cross-section surveys, annual channel pebble counts, and channel head extension documentation.
A wide variation in annual precipitation during the study has complicated the analysis of treatment effects. Annual sediment yields showed large responses to increases in rainfall, and in the West Branch watershed several large landslides were triggered by the high rainfall years. As a result, sediment loads were high, reaching a peak of 2,712 t/mi^2 for the West Branch in water year (WY) 2019. Elevated sediment loads were documented on the East Branch in WY 2016 and WY 2017, at least partly resulting from roading and harvest. However, differences in the two watersheds likely played a role as well, since drainage density is almost two times higher in the East Branch compared to the West Branch.

The long-term erosion estimate using Be-10 analysis and averaged between the two branches was assumed to have a value of 862 t/mi^2/yr. Current erosion rates were found to be below the long-term average during drier years and above during the exceptionally wet water years (WY 2016 and 2017) following roading and timber harvest. A large landslide in the control watershed triggered elevated sediment loads in subsequent years that were above the long-term average. Landslides delivering sediment were almost entirely found in the West Branch. Also, in general, the West Branch had higher loading from small streamside landsliding than the East Branch.

Sampling during storm events generally showed tributary streams entering the main stem had clearer water than the main channel. Higher tributary turbidity was observed consistently at a few locations and linked to active landslides and debris flows, or incision into earth flows. Turbidity sampling at road crossings showed a significant number of sites where turbidity below crossings was higher than above, suggesting sediment contribution from roads. The strongest signals were the increases from the road used for timber hauling. Road construction appeared to reduce road-related turbidity increases when the road was rocked. Plumes of sediment deposited below a road drainage feature were longer on active roads than on inactive roads. Rill lengths on road surfaces were longer on inactive roads than on active roads, likely due to use ATV traffic associated with the study (see Chris Faubion's MS thesis at https://digitalcommons.humboldt.edu/etd/439/). No changes in channel density were recorded, as Class III channel head extension did not occur. Channel cross-section surveys revealed a general trend of scour, downcutting, and channel widening. The sediment budget constructed for Railroad Gulch is dominated by landslides, with lower amounts from channel scour, small streamside landslides, and road erosion. A large residual term is necessary to balance the sediment budget, and this might be attributed to an unaccounted sediment-producing component and/or measurement error.

In summary, annual precipitation varied greatly before and after roading and timber harvest, complicating analysis of treatment effects. Additionally, the occurrence of landslides and debris flows in the control basin and other factors confound the assessment of the effects of the road work and timber harvest, as well as conclusions regarding the effectiveness of the management practices utilized during the study. In general, annual sediment loads showed steep responses to increased annual rainfall. Additionally, it is likely that a portion of the elevated sediment load in the treated East Branch watershed resulted from roading and harvest, but there is indication that differences in the two watersheds were also important. The process-based data collected during this study are useful for increasing our understanding of impacts associated with road construction, road use, and timber harvesting in a highly erodible watershed. **A draft final report was reviewed by CAL FIRE and HRC staff in January and**

February; the final report will be submitted shortly. Co-Chair Husari asked Dr. Stubblefield to present this study to the BOF's Forest Practice Committee.

5. Release of the 2021-2022 EMC Request for Funding Proposals (RFP)

Kristina Wolf summarized the 2021-2022 EMC RFP document, previously reviewed by the Committee. The RFP will be posted on the EMC website on July 21, 2021. Project proposals are due on September 15, 2021, with invited full proposals due in November 2021. See: https://bof.fire.ca.gov/media/r0khqyf3/5-rfp-2021-emc-final_ada.pdf

6. Update on the EMC Program Grant Development

Kristina Wolf updated the EMC on progress made to date on moving from using contracts to grants for funded EMC projects. Contracts will continue to be used for FY2021-2022 projects, with grants taking their place in FY 2022-2023. Grants are a more desirable funding source for project proponents, and they will simplify project administration for EMC staff. An initial draft grants guidelines document has been developed (see: https://bof.fire.ca.gov/media/muvbri5n/6-emc-grant-guidelines-draft_ada.pdf). Further input will occur from the CAL FIRE Grants Program and BOF legal staff. **If EMC members have comments on the draft document, send them to Kristina Wolf (kristina.wolf@bof.ca.gov).**

7. EMC Strategic Plan Update

Sue Husari, Loretta Moreno, and Kristina Wolf informed the Committee that the EMC Strategic Plan needs to be updated in several sections (e.g., project liaisons, completed research assessment process). Changes should be completed by the first meeting held in 2022. **Kristina Wolf will send an email message to the EMC requesting input on the sections requiring updating, and asking for volunteers for drafting the revised language. To avoid Bagley-Keene Act violations, no more than two EMC members will be able to work on individual sections.**

8. Completed Research Assessment Process from the EMC to the BOF

Kristina Wolf led a discussion on the EMC's completed research assessment process document. The final version, reflecting input from the EMC and the BOF, is posted at:
https://bof.fire.ca.gov/media/g3plonxx/8-emc-completed-research-assessment_final_ada.pdf
This document allows the EMC to take research findings and translate them into implications for the Forest Practice Rules (i.e., how the research results can be used). A motion was made and seconded to use the following steps: (1) two EMC members fill out the completed research assessment form, (2) EMC members read the document and vote on moving it to the BOF, and (3) if approved, the document is forwarded to the BOF.

The motion passed with the following vote:

Husari	Aye
Moreno	Aye
Chinnici	Aye
O'Connor	Aye
House	Aye
Anderegg	Aye
LaNier	Aye
Leonard	Aye

Drury	Aye
Short	Aye
Coe	Aye

9. Project EMC-2015-001 Class II-Large Watercourse Study; Presentation of the Draft Completed Research Assessment Form

Drew Coe summarized the completed research assessment form he and Matt House filled out for EMC-2015-001 Class II-Large Watercourse Study. This project documented that drainage area is considerably more important than the active channel width for determining both Class II flow connectivity and flow permanence. The document includes a suggestion about simplifying the FPRs by removing channel width as a criterion for classifying Class II-Large watercourses. Co-Chair Husari stated that this document serves as an excellent model for future completed research assessments. A motion was made by Member Chinnici to forward the Class II-Large completed research assessment to the BOF, with a friendly amendment to allow for minor edits by Drew Coe. The motion was seconded by Member O'Connor. The following votes were recorded:

Husari	Aye
Moreno	Aye
Chinnici	Aye
O'Connor	Aye
House	Abstain
Anderegg	Aye
LaNier	Aye
Leonard	Aye
Drury	Aye
Short	Aye
Coe	Abstain

During the meeting, it was stated that the motion failed to pass, since it was understood that a quorum of EMC members (2/3 of 17 members) needed to vote aye to pass the motion. **Subsequent to the meeting, it was determined that we do not need a two-thirds majority to take action on an item, but rather a simple majority. The document will be moved forward to the Board's Forest Practice Committee.**

10. Updates from EMC Project Liaisons

EMC-2019-002 Evaluating Treatment Longevity and Maintenance Needs for Fuel Reduction Projects Implemented in the Wildland Urban Interface of Plumas County: Stacy Drury stated that he has been in contact with the Feather River RCD and that they are moving forward with the project, but that COVID has put them behind schedule. Some sites were burned in 2020, and current fires are encroaching on some of their plots. They are on track to deliver a quality product with useful information.

EMC-2016-003 *Road Rules Effectiveness at Reducing Mass Wasting (Repeat LiDAR Surveys to Detect Landslides)*: Bill Short informed the group that LiDAR data for Amador and El Dorado counties has been accepted, and that CGS should be getting the data in the next few weeks (it will be uploaded to the national USGS site (https://www.usgs.gov/core-science-systems/ngp/tnm-delivery/gis-data-download).

EMC-2019-005 *Sediment Monitoring and Fish Habitat—San Vicente Accelerated Wood Recruitment*: Bill Short stated that the 2020 CZU Complex burned the two study watersheds. CGS is unsure if the project proponent is going to modify the THP to continue to do the large wood enhancement project. Staff met with BOF staff to discuss alternatives that might be available, including changing the project to a post-fire large wood study (project in a transition/holding pattern currently).

11. Public Forum

Richard Gienger stated that it is imperative that EMC projects look at alternatives that will provide optimum forest management, addressing climate change, carbon sequestration, and wildfire resilience (i.e., criteria for healthy forests). These projects should provide standards that we are aiming for when undertaking forest management.

Loretta Moreno responded, informing Richard about the CARB scoping plan meeting and workshops being held for the 2022 Scoping Plan Update. A Natural and Working Lands Technical Workshop was held on July 20, 2021; public comments can be submitted through August 3, 2021 (see: https://ww2.arb.ca.gov/sites/default/files/2021-07/nc-carb_sp_nwl_july2021.pdf)

Additional information is available at: https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/scoping-plan-meetings-workshops

12. Future Meeting Locations, Dates, and Agenda Items

The next EMC meeting will be held in October; Kristina Wolf will send out a Doodle poll for member availability. EMC members are to indicate if they plan to attend the meeting when it is scheduled. Additionally, if EMC members do not plan to attend any future meetings, they are to inform Kristina Wolf so that new members can be nominated for BOF approval. The tentative plan for the October meeting is to be in-person in Sacramento (COVID pending). Submitted project proposals for FY 2021-2022 funding will be reviewed.

13. Announcements

Kristina Wolf stated that the BOF's Range Management Advisory Committee (RMAC) will hold a series of three workshops on July 29th, August 5th, and August 12th, titled **Sustainable Management of California's Fire-Prone Landscapes: Grazing for Community Resilience**. These virtual workshops with the California Fire Science Consortium will discuss the use of prescribed livestock grazing as a tool to support sustainable fuel reduction and environmental management in multi-use landscapes. See: https://bof.fire.ca.gov/board-committees/range-management-advisory-committee/