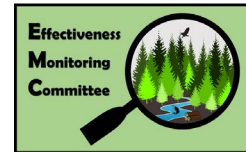


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Effectiveness Monitoring Committee (EMC) Meeting Notes

Meeting Date and Time: Thursday, February 16, 2023 9:30 AM

Virtual Meeting

A recording of the meeting may be viewed by filling out the registration form here:

<https://attendee.gotowebinar.com/recording/5808692870951530588>

1) Call to Order, Hybrid Meeting Format, Roll Call, and Core Values – Dr. Kristina Wolf, Board of Forestry & Fire Protection (Board) staff

Dr. Wolf called the meeting to order, reviewed the hybrid meeting format and methods for interacting with the committee, and called the roll:

Participants (30)

Members Present (13) – Loretta Moreno (Co-Chair), Dr. Elizabeth Forsburg-Pardi (Co-Chair), Bill Short, Ben Waitman, Jessica Leonard, Drew Coe, Dr. Matt O'Connor, Dr. Peter Freer-Smith, Dr. Michael Jones, Mathew Nannizzi, Clarence Hostler, Sal Chinnici, and Dr. Leander Love-Anderegg

Members Absent (2) – Dr. Stacy Drury and Jim Burke

Support Staff (2) – Dr. Kristina Wolf and David Fowler

Audience Participants (13) – Michael Baker, J. Lopez, Dr. Kyle Farmer, Max Hylaris, Prachi Kulkarni, Lance Le, Roberta Lim, Jonathan Meurer, Jane Van Susteren, Will Olsen, Alexandra Rosado, Rich Wade, and Richard Gienger

2) Report by the Co-Chairs – Dr. Forsburg-Pardi and Chair Moreno

a. Membership Updates

i. **Open Seats** – up to six open/pending open seats; see roster [here](#).

- **Monitoring Community:** one open seat
 - Previously filled by an academic with forest ecology and forestry expertise from University of Nevada, Reno; this seat was vacated in September 2021.
- **Agency Representatives:** two open seats
 - **Central Valley Regional Water Quality Control Board (CVRWQCB)** – previously filled by Justin LaNier, whose background is in geology, hydrology, and water quality; vacated after the 11/18/2022 meeting. The CVRWQCB recommended a nominee, and the EMC will review and vote on their application during this meeting. **The EMC will be reviewing an EMC application for this seat later today.**
 - **US Fish and Wildlife Service (USFWS)** – one open seat; the USFWS was expected to

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recommend a nominee; but that has been promised for a year now, and the candidate has not submitted their materials for consideration, so I suggest we continue to seek a new candidate.

Pending Open Seats: three pending open seats

- **State Water Resources Control Board (SWRCB)** – currently filled by Jessica Leonard, whose background is in watershed management; Member Leonard will remain in this seat until filled; the SWRCB is expected to recommend a nominee.
- **CAL FIRE** – currently filled by Drew Coe, a Registered Professional Forester (RPF), whose background is in hydrology and forestry. Member Coe will vacate this seat once an appropriate candidate is appointed.
- **US Forest Service (USFS)** – currently filled by Dr. Stacy Drury with the Pacific Southwest Research Station, whose background is in fire ecology. While not a mandated seat, the USFS has had agency representation on the EMC for some time, and there is strong EMC support for continued representation. Member Drury will vacate this seat once an appropriate candidate is appointed.

ii. Expiring Terms: four expiring terms in 2023

Name	Specialty	Affiliation	Term End Date
Loretta Moreno	Forest Ecology	California Natural Resources Agency	07/05/2023
Matt O'Connor, Ph.D.	Geology and Geomorphology	Public, O'Connor Environmental	11/06/2023
Leander Love-Anderegg, Ph.D.	Forest Ecology and Forestry	University of California, Santa Barbara	07/05/2023
Peter Freer-Smith, Ph.D.	Plant Ecology and Environmental Policy	University of California, Davis	07/05/2023

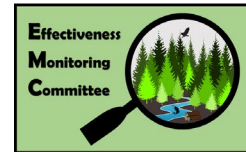
If members know their plans, please let Board staff know as soon as possible if they will be staying on or stepping down at the end of their term.

b. Full Project Proposal Funding updates

Two proposals in process of being finalized for fund encumbrance by Board staff and the grants department; two projects reallocated funds from later Fiscal Years (FY) to this current FY, such that the EMC will have reverting funds in the amount of \$44,467.00 (previously, this amount was going to be \$47,588, so about \$3,000 will be retained compared to what was originally proposed and accepted by the EMC). Perhaps if there is a research field trip, some

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of those funds could be used to support that, if spent by 06/30/2023. But that's still quite a lot that will revert back to the general fund and not spent on funding research. The third EMC proposal does not request funds until FY starting 7/1/2023, so we will not begin the encumbrance process until that FY budget is posted.

The committee discussed potential uses for these funds so that they would not revert. Funds should be utilized for the purposes of supporting EMC research in some way, based on stipulations for how funds are to be allocated. The deadline to spend these funds is June 30, 2023. Potential options discussed included:

- Member Coe: a field trip could be a valuable vehicle to recruit new EMC members and showcase EMC research.
- Co-chair Moreno: Can EMC funds be utilized to reimburse travel for EMC members? We should get some clarity around allowable spending from legal counsel. Additional Funding could NOT be allocated to existing contracts because amendments take many months, and there is not enough time to process a contract amendment.
- Member O'Connor asked if funds could be utilized for some other sort of outreach product, such as a compendium of research results, or the like that could also be utilized to recruit new members? While a field trip might be hard to organize in the time we have left, maybe a well put together video presentation would be useful; this could appeal to potential grantees and members to get the EMC in the eye of the public. This was supported by Member Short.
- Member Freer-Smith asked if paying for time spent on formal summaries or reviews of project findings since the EMC was formed and connecting them to any Forest Practice Rule (FPR) changes would be an allowable use of funding. This could be to pay for time spent on the Completed Research Assessment (CRA) or other kind of summary. Co-chair Moreno expressed concerns about inequity in lack of payment for past summaries. Dr. Wolf responded that this kind of allocation, especially to an outside entity, would likely require some kind of contract, and there is not enough time left in the FY to develop a new contract.
- If there are other ideas that come to mind, please email Board staff with that information within the next two weeks. Board staff will consult with legal counsel about allowable spending for these funds, and will report back to the committee by email.

c. 2023/24 Request for Proposals

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Dr. Wolf presented the EMC draft Grant Guidelines and potential timelines to the committee, and may be viewed [here](#). Dr. Wolf will send the draft guidelines out to EMC members soon with a request for revisions. The EMC reviewed the proposed 2023/24 timeline for reviewing applications:

Mar 2023	May/Jun 2023	Jun/Jul 2023	Jul/Aug 2023	Aug 2023	Oct /Nov 2023
Solicitation of Project Proposals released	Initial Concept Proposals due; EMC will review and request Full Project Proposals	Full Project Proposals due	EMC will rank projects and recommend funding	EMC will notify applicants; grants developed	Funds dispersed; project work begins

Member Hostler suggested that timelines be concentrated into one clear section in the Grant Guidelines under Section 4 to reduce redundancy, and that one month be selected in the table above, rather than a range of months.

The EMC members settled on the following tentative timeline for actions around the grant development, review, and funding recommendations:

Action	Proposed Deadline	EMC Meeting Dates
Solicitation of Project Proposals released	Wed March 15, 2023	NA
Initial Concept Proposal due, EMC to review	Wed May 17	Wed Jun 7
Full Project Proposal due, EMC rank and recommend	Wed July 5	Wed Aug 9
Develop Grants	After Aug EMC mtg	NA
Notify Applicants	After Aug 23 board meeting	NA
Encumber funds, work begins	~ Oct/Nov or later	NA

EMC Members will have about two weeks from the time they receive the Initial Concept Proposals (ICP) until they should be prepared to discuss the proposals at the next EMC meeting, and will have about three weeks from the time they receive the Full Project Proposals (FPP) until they should be prepared to discuss, vote on, and recommend funding on the FPPs at the next EMC meeting. Applicants from which FPPs will be requested from the EMC will have approximately four weeks after the email request from the EMC to submit an FPP to the EMC that addresses any EMC requests for information or questions and includes a full line-item budget and project timeline, including a timeline of products/deliverables. Dr. Wolf clarified that beginning last FY, the grant guidelines were revised to request more information in the ICP to help the EMC determine if FPPs should be requested, and that the additional information added in the FPP is relatively less labor-intensive compared to the ICP.

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Final Chair Update:

Co-chair Moreno also added that the Natural Resources Agency (CNRA) received \$25 million for remote sensing for the legislature to focus on critical wildfire and climate issues in high fire risk areas in the state, including timberlands. A major set of investments that have been progressively rolled out since 2021 include large-scale LiDAR acquisitions, and more gaps are being filled as partners step in to fill those data gaps. The CNRA is also building out several key datasets that should be helpful in future assessments, including a change-detection and attribution product that will pick up on incremental changes happening across the state regarding fire, tree mortality, tree harvests, etc. Additional work will also include segmenting of tree canopies and information on individual trees across the state to help understand fire severity interactions, biodiversity, habitat suitability, and more across all land ownership types. These datasets should become available over the next several years. She will provide updates as this progresses.

3) Project Updates

a. EMC-2017-008 CRA

This was presented to the Board at their last meeting, and is now finalized and available online.

Project Liaison Guide

In response to questions from EMC members about the responsibilities of project liaison, Dr. Wolf created a draft [Project Liaison Guide](#) to help guide members through this process. This revised draft incorporating suggested edits was sent out on February 3, 2023 to the EMC. All new members and new Project Liaisons will receive a copy of this once it is finalized. All current liaisons will also receive a finalized copy to disseminate this new document and incorporate it into ongoing project management procedures. Co-chair Moreno indicated that for Item 4, if the CRA concludes that the research report is not adequate, she suggests that the EMC goes back to the PI and request revisions.

Member Waitman suggested we add information about EMC members keeping communications records to this. This could be added under Item 2, and the contact records should be submitted annually at the end of each year to Board staff. Dr. Wolf will revise this document based on comments received and send the final version to EMC members.

Current Project Liaisons and Member Assignments can be found online [here](#).

- **EMC-2016-003: Repeat LiDAR Surveys to Detect Landslides** – Member Short and Member O'Connor are the PIs, but are also the liaisons. **Two different EMC members are needed to complete the CRA.** Member Short summarized the project to provide context for EMC members deciding on potential involvement in developing the CRA for this project. Member Short stated that this was one of the first EMC proposals and is designed to test the effectiveness of repeat surveys in assessing landslide movement in harvested and unharvested

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forests as a proof-of-concept that these repeated surveys can be used in the future following large storm events rather than requiring on-the-ground assessments and aerial photographs. Previously collected LiDAR in the El Dorado County area is being used in these assessments. The project is not entirely completed and the analysis still needs to be written up, as well as the final report. The CRA is an anticipated upcoming need.

- **EMC-2017-001: Effects of Forest Stand Density Reduction on Nutrient Cycling and Nutrient Transport at the Caspar Creek Experimental Watershed** – at the last meeting Member Coe reviewed the subject matter so we could find a second project liaison to work on the CRA, which should be prepared as the final project presentation and report have been completed. Member Coe stated that the final presentation and report were very comprehensive, and additional publications may come out of this. The CRA can be created based on the final report, or the EMC could wait until a publication is developed. Member Coe is bringing on a new scientist in June that will be joining that project to take it to the finish line.
- Member Coe provided an update on a post-fire salvage logging document associated with Boggs Mountain Demonstration State Forest, which is summarized in [California Forestry Report No. 7: Mitigation Potential Sediment Delivery from Post-Fire Salvage Logging](#). This was a collaborative effort between the Pacific Southwest Research Station and CAL FIRE's Watershed Protection Program. This is geared toward practitioners with a goal of reducing sedimentary impacts with post-fire salvage logging. There is a lot of emphasis on understanding post-fire process, the effects of logging on those processes, and the interactions between those disturbances. This is the first report of its kind synthesizing research results into operational recommendations.
- Member Coe also noted that the Board approved the Forest Fire Prevention Monitoring Report at the January meeting; the draft has now moved to agency for further review. This extensive report looks at outcomes following implementation of forest fire prevention exemptions, and recommendations do call for the potential need for statutory change.
- **EMC-2017-007: The Life Cycle of Dead Trees and Implications for Management** – Co-chair Moreno reported that she received a final project report and she will be reaching out to Member Jones to work together on developing the CRA to present at the next EMC meeting.
- **EMC-2017-006: Tradeoffs among riparian buffer zones** – We will have a presentation on this today, and after that we will ask for volunteers to take on the role as project liaisons and to complete the CRA if it is ready for that. Member Coe volunteered to work on the CRA with the project liaison. Member Nannizzi also volunteered to work on this.

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4) Research Themes and Critical Monitoring Questions Revised Final Draft – Co-Chairs Moreno and Dr. Forsburg-Pardi

A revised draft of the most recent version was provided to EMC members for their review prior to this discussion. Co-Chair Moreno explained that the goal for today is to review the current draft and if possible, vote on a final version.

Dr. Wolf reviewed in brief the past actions taken on this document: the Co-Chairs revised the now stand-alone document based on comments received previously during the public comment period from agency and public stakeholders, comments submitted by EMC members and agency stakeholders, and from EMC member discussion at public meetings. EMC members received the revised final draft via email on 2/3. This has been under revision for about one year, and all changes and recommendations as discussed have been incorporated as appropriate. Dr. Wolf also noted a typo under Theme 1 in the current version, where a Critical Monitoring Question (CMQ) was not indicated by a letter as were all the others, and she will correct that. Previous documents and versions associated with this item include the following:

- [DRAFT Nov 2022 Research Themes and Critical Monitoring Questions](#)
- [Co-Chair Moreno Comments on Themes and CMQs](#)
- [Comments rcvd 11/15 2022-23 Themes and Questions DRAFT Comments NCRWQCB](#)
- [DRAFT Sept 2022 Research Themes and Critical Monitoring Questions](#)
- [Public Comments on Research Themes and Critical Monitoring Questions](#)
- [2017-18 Research Themes and Critical Monitoring Questions](#)
- Supplemental materials to public comments:
 - [6d-i. 1 - CZU Fire Redwood Damage Assessment](#)
 - [6d-ii. 1 - Redwood Defect Study at SVR](#)
- [6e. 3 - Public Comment 2022-07-29](#)

The current version as shared today is [online](#), and edits were made live during the EMC's live discussion.

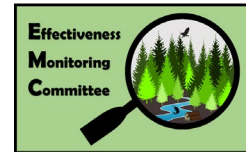
The Co-Chairs reviewed the various changes being made, and comments/justifications regarding changes are reflected in the current version shared online. In particular, one major change was the addition of a new Theme 12: Climate and Wildfire Resilience, and associated CMQs within that new Research Theme.

Member O'Connor stated the hydrology questions (a through e) talk about riparian function but don't specifically mention fish habitat and seems more terrestrially-oriented. He would like to maybe see an additional item that is more explicit about whether or not management can impact stream flow. Question d was modified to add stream flow to the parenthetical riparian functions.

Member Coe stated that the order of words insinuate a priority, and he would prefer to see wildfire first and climate second, in terms of the title of the new Theme. He is concerned we blow

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up the scope of the EMC's purview by introducing climate change as a direct theme. The State has already invested millions in climate change, and he is reluctant to lose focus on the FPRs within the EMC, given the small pot of money it has to put toward testing the FPRs. Co-Chair Moreno agrees this is a good point, and she indicated that the EMC focuses on management practices, and we cannot stop climate change, and it interacts with a lot of drought and mortality issues we are already seeing in our forests; it is not all fire. We need to pick up on how management and the FPRs affect forests in light of climate change and other disturbances. Perhaps we could tighten the language here to address this concern about the potential for losing a direct link to the FPRs and management. The Theme title was changed to "Wildfire Resilience and Climate". Question a was also altered to include a parenthetical after the term "climate change" to clarify that this is about physical forest health issues that are related to climate change that are resulting in altered yields: (e.g., in response to drought, bark beetle)

Member Hostler stated that mentioning cannabis cultivation seems out of place in Theme 12. That was removed from list of stress factors introduced in the preamble for this Theme, as was fragmentation/urbanization and climate change.

Member Nannizzi stated that in Question a he would like to see the sentence started as follows: "Improving overall forest wildfire resilience and the ability of forests to respond to climate change...". The sentence was changed to reflect that request.

Member Hostler noted he would like climate removed from this, or perhaps refer to it as "impacts of climate change", rather than just using the term "climate change". The Theme title was changed to Wildfire Resilience and Impacts of Climate Change, to remove focus on climate change, and increase focus more on wildfire and responses of forests to drivers of forest change related to climate change.

Member Coe suggested that Theme 12 should read Wildfire and Climate Resilience; this change was made.

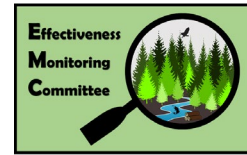
Member Jones suggested that we change the Theme 12 title to be broader, and focus on disturbances in general to alleviate concerns about focuses on climate change. The Theme 12 was changed to Resilience to Disturbances in a Changing Climate to emphasize multiple disturbances, and not just climate change. The Theme 12 title was changed accordingly.

Member Coe stated that stocking and silviculture have a role to play in distributing water. As forest managers, we are picking the winners and the losers in these water-limited forests. So he would like to see anything related to climate to have more focus. He suggested a change be made in Question a to add "reducing plant water stress" to the parenthetical e.g., after climate change; this change was made.

Co-Chair Forsburg-Pardi suggested changes be made in the preamble to reflect the above changes, and the "and to protect biodiversity and to reduce wildfire threats..." portion of the second sentence in the preamble was removed to help increase focus on the FPRs.

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Member Jones stated that for Question b, the topic of assisted migration and the topic of using non-native species more adapted to a changing climate might be added to this to address that possibility. He asked if that is something the EMC would entertain as a research project? The suggested change to Question b is to perhaps make it more specific to help ensure that non-native species aren't being introduced, as he is not a fan of assisted migration. Right now the question is very broad. Co-chair Moreno suggested that combining Questions a and b (by deleting Question b) would reduce some redundancy; this change was made. Item d was also moved up in the list to come after Question a.

Dr. Wolf noted that if this document is not finalized today, it will delay the release of the RFP by at least one month, or longer, and the dates previously discussed for meetings would have to be altered. Member Coe and Co-Chair Moreno agreed this should be voted on today based on the changes made live during this meeting.

This final lists of Research Themes and CMQs will be used in the discussion of the prioritization of CMQs for this year's Request for Proposals (RFPs).

A motion was made to approve this revised version by Member O'Connor; this was seconded by Member Waitman.

Roll Call Vote

Drury	absent
Waitman	Aye
Leonard	Aye
Coe	Aye
Hostler	Aye
Short	Aye
Burke	absent
Jones	Aye
Nannizzi	Aye
Chinnici	Aye
O'Connor	Aye
Love-Anderegg	absent at time of vote
Freer-Smith	Aye
Forsburg-Pardi	Aye
Moreno	Aye

The motion passes unanimously with 12 Ayes. The final version will be sent to the Board for its review and vote in the March Board meeting. The final, revised version based on edits made live today will also be posted [online](#).

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5) Project Update Presentation: EMC-2017-002 Boggs Mountain Demonstration State Forest (BMDSF) Post-Fire Automated Bird Recorders Study – Anastasia Stanish, Department of Forestry & Fire Protection

Department of Forestry & Fire Protection Forest (CAL FIRE) Practice Biologist and Registered Professional Forester Stacy Stanish presented a research update on the Boggs Mountain Demonstration State Forest (BMDSF) Bird Study investigating impacts from post-fire salvage logging, an early EMC-supported study.

BMDSF is located in Lake County and comprises stands of ponderosa pines, sugar pines, Douglas Fir and hardwoods at 2400 to 3750 feet in elevation across almost 3,500 acres. The 2015 Valley Fire burned 99% of BMDSF at a moderate to high severity, resulting in a “moonscape” appearance thereafter. Plots were developed on the forest to investigate three different treatments: 1) “Harvest – pile & burn-rip”: salvaged, ripped, pile burned, herbicide, and planted; 2) “Harvest – top & scatter”: salvaged, pile burned, no herbicide or planting; and 3) “Control”: unsalvaged. This bird study was nested into those plots with four replicates of each treatment type. Plots were about 15 acres in size.

The study design was based on the Ecological Biodiversity Monitoring (EBM) protocol developed by the Department of Fish & Wildlife (CDFW), which requires setting out recording units in late spring and early summer over the course of three days, recording for 5 min at 30 min before sunrise, at sunrise, and 30 min after sunrise. These are autonomous recording units (ARUs). Photos were also taken in all cardinal directions from the center of each plot to capture information on the vegetation at the time of the recording. The study continued for three years, and data were sent to a bird interpreter who listens to the recordings and documents the types of calls/songs, how close sounds were to the ARU, and wing flaps, consistent with the EBM protocol. Not a lot of detections were collected in the salvaged plots, and there are many, many more in the control plots.

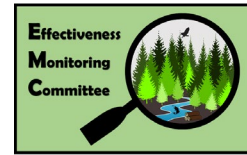
Sixty-three distinct species were identified, which is remarkable in a forest that had been burned so dramatically; this is consistent with previously conducted point count survey done many years before the Valley Fire. There was consistent but decreasing occupancy over the course of the three years. A cursory analysis of Species Richness showed that the control was most consistent, while treatment plots were much more variable. Products from this research thus far are as follows:

2019 was the last year for data collection, and the bird interpreter completed their work in 2020. Covid delayed the analyses and study completion. Stacy will work with an in-house CLA FIRE statistician on the analysis, and she would like to see a publication come out of this. She will restart the study in 2025, she would like to replicate it again in 2035 to investigate the “winners and losers”, i.e., changes in species dynamics, in these plots over time.

Member Coe commented that this research is tied to the Fire and Resource Assessment Program (FRAP) study, and FRAP is just getting to their data analysis now, so the strength of this

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study will be increased once those abundance and richness metrics can be linked to the FRAP vegetation characteristics data.

Co-Chair Moreno appreciated the study setup and design with the information presented. She asked about adjacency of study sites, and how close they were together and if there was a patch or size effect, since the plots appear to be nestled close together. Stacy spoke with Brett about this aspect, and his opinion was that these patch sizes were the lower limit of what he would use, and it is as about as far out as the ARUs would be able to detect on small birds. You can still hear a distinct difference between distance and the sound, but the adjacency could be an issue since some of the sites were salvaged right next to each other and may not be considered independent if occupancy in one plot affects the other. The recording units for small birds really only have a reach of about 200 to 300 feet reliably, so that limits the size and interference.

Member Waitman asked: The post-fire salvage biodiversity literature seems (to me) to end up with two basic conclusions. Biodiversity decreases overall and post-fire bird communities tend to be representative of more open habitats. Does that describe your results? Stacy responded that yes, that is what they have seen over time; the diversity is declining over the three years that they have, and that is why it is nice to have the controls because there are certain species that were only detected in the controls. This will be noted in the final report.

Stacy's presentation is posted [online](#). Bird calls in the PDF presentation cannot be played, but the presentation with embedded recordings can be requested from Board staff by emailing Kristina.wolf@bof.ca.gov.

6) Annual Report and Workplan – Co-Chair Moreno

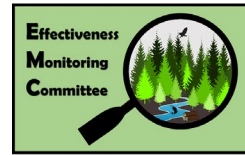
The Annual Report and Workplan has been completed and was sent out for revisions to EMC members in December and January. A revised draft based on any suggested edits was produced and sent to EMC members on 2/3. A motion was made to approve this [revised version](#) by Member Nannizzi; this was seconded by Member Short. There was no further discussion.

Roll Call Vote

Drury	absent
Waitman	Aye
Leonard	Aye
Coe	Aye
Hostler	Aye
Short	Aye
Burke	absent
Jones	Aye
Nannizzi	Aye
Chinnici	Aye

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O'Connor Aye
 Love-Anderegg absent at time of vote
 Freer-Smith Aye
 Forsburg-Pardi Aye
 Moreno Aye

The motion passes unanimously with 12 Ayes. The recommendation will be sent to the Board for its review and vote in the March Board meeting. The final version will be posted [online](#).

7) 2023/24 Request for Proposals and Priority Critical Monitoring Questions – Dr. Wolf, Board staff

The lunch period was used to vote for each EMC members' top five choices for the priority CMQs in the upcoming RFP that will be released in March. The survey was provided by Dr. Wolf via email to all EMC members. Dr. Wolf reported that the results of the initial poll showed one clear winner among the CMQs, and 8 ties. She noted that she sent out a secondary poll to the EMC members, and asked them to pick their top four now from the 8 tied CMQs. She will then tally the results and report back to the committee. The results of the second poll showed six top CMQs, and shared her screen to show the results of the poll:

Theme 12: Resilience to Disturbances in a Changing Climate	Are the FPRs and associated regulations effective in ...	(a) improving overall forest wildfire resilience and the ability of forests to respond to climate change (e.g., in response to drought or bark beetle; reducing plant water stress) and variability, and extreme weather events (evaluate ecosystem functional response to fuel reduction and forest health treatments)?
Theme 5: Fish Habitat	Are the FPRs and associated regulations effective in ...	(a) maintaining and restoring the distribution and quality of foraging, rearing and spawning habitat for anadromous salmonids?
Theme 6: Wildfire Hazard	Are the FPRs and associated regulations effective in ...	(d) managing forest structure and stocking standards to promote wildfire resilience?
Theme 12: Resilience to Disturbances in a Changing Climate	Are the FPRs and associated regulations effective in ...	(b) maintaining conifer and broadleaf stands which are well adapted to climate in order facilitate riparian functions (e.g., shade, temperatures, primary productivity, stream flow)?
Theme 1: Watercourse and Lake Protection Zone Riparian Function	Are the FPRs and associated regulations effective in ...	(h) managing WLPZs to reduce or minimize potential fire behavior and rate of spread?

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Member Coe noted that the first and last CMQs have a similar emphasis. Co-chair Forsburg-Pardi suggested that the EMC choose the top six, rather deciding between the last two questions, which tied for fifth place. Member Short noted that the EMC has yet to look at any studies that look at cumulative impacts, so that is worth considering. Co-Chair Moreno noted that cumulative impacts is a long-standing important question, and allowing there to be 6 priority questions seems a clean and elegant solution. Member Hostler agreed with this approach, as did Member O'Connor. Therefore, the top most voted for questions in the two polls will be those shown above. No vote was made because the EMC has already adopted the CMQs, and is not excluding any others from being eligible for EMC-funding support.

8) Final Project Presentation: EMC-2017-006 Tradeoffs among riparian buffer zones – Dr. Rob York, U.C. Berkeley

Overview

Dr. Rob York provided a presentation titled "Fuel treatment alternatives in riparian zones of the Sierra Nevada." Options in watercourses are relatively limited due to the protected status of riparian areas. The King Fire in 2014 had a big influence on this research; it was a high-severity fire with generally severe effects, but there was some decent survival in upslope areas adjacent to riparian areas in areas with good fuel treatments, but massive mortality in untreated areas in riparian areas. This led to the idea that perhaps these special status areas should be prioritized for fuel treatment, which is the opposite of what we have now. The PI asked: Is there an illusion of needing protection in riparian zones? That is, are the lack of treatments in riparian zones based on out-of-date understanding of protective measures, and therefore is this management counterproductive to protecting riparian zones.

Background

RPF's we tend to think of riparian forests as Watercourse and Lake Protection Zones (WLPZ) and think of the table of Procedures for Determining WLPZ Protective Measures. Riparian area Fire Return Intervals (FRI) and upslope from riparian areas are similar, at 16.6 and 16.9 years, respectively, and seasonality (i.e., late summer-early fall) is similar as well. When we move from super dry to less dry forests, we still see low density forests dominating the landscape; so it is not a big leap to assume that riparian zones also naturally be low-density. Riparian zones are disturbance dependent, but we don't manage them as if they are, and allow them to grow more densely due to restrictions around management practices in riparian areas. In an upslope WLPZ, we may see surface fuel of 13 tons per acre, and in a WLPZ, we might see 45 tons per acre, and that is a very high surface fuel load in comparison, so it is not likely a natural structure. So yes, it does seem there may be an illusion of protection in riparian zones by preventing management within those zones and keeping RPFs out of managing them.

Dr. York suggested we consider treatments in WLPZs to help restore structure, process (a heavily thinned canopy is easier to burn during permit-constrained conditions, and so if we want to have

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prescribed fire in riparian zones, we need to manage differently than we have in the past), and composition (bio-indicators of localized high severity disturbance in riparian zones support the idea that riparian zones are disturbance-dependent). However, just doing fuels treatments outside of timber operations isn't necessarily sustainable either because of the cost, and if there is no timber to offset those costs, it is not economically feasible. Compared to a prescribed burn or mastication alone, a commercial thin brings in income that allows for additional fuels treatments, like burning and mastication. Some treatments may also not be considered because they might be too damaging within the riparian zone, causing soil compaction, erosion, sedimentation and runoff, introduction of invasive species or potential for introduction of fire-sensitive riparian species, and potential heating of water from increased radiation; we want to avoid these damaging effects and understand the trade-offs of management practices within riparian areas.

Study Design

This study has three phases, and is intended to be a long-term (decadal) study. This current Phase (Phase 1) is to conduct experimental trials of treatment alternatives at one site to inform policy and regulatory development. Phase 2 will expand this study to several sites. Phase 3 will include repeat treatments and long-term monitoring, with the intention to continue to inform policy and regulatory development. This presentation focuses on Phase 1 in Blodgett Forest Research Station in El Dorado County in the Central Sierras.

The PI designated all Class I and II WLPZs in the forest as the study areas, and they were each randomly allocated to one of four treatments: 1) Control – do nothing; 2) Status Quo: follow the FPRs – no heavy equipment and comply with the WLPZ protections table introduced earlier; 3) Thin/Fuel Treatment with Equipment, "Fuel tx" – following guidance like in Agee and Skinner's article, "Basic principles of forest fuel reduction treatments", thinning from below to 150 ft²/acre with follow up treatment to pile and burn or broadcast burn to reduce ladder and surface fuel treatments; and 4) Thin/Gaps/Fuel Treatment with Equipment, "Fuel Tx+gaps" – same as treatment 3 plus gap-based silviculture with gaps ranging from 0.1 to 0.4 acres, post-harvest slash piling with excavator and pile burning, and planting with Ponderosa pine and sugar pine. They had to get experimental forest designation from the Board to do this work.

Measurements within plots included forest structure and composition; light availability (%TTR = of light that hits the canopy, the percent that reaches the forest floor); alder trees, revenue, yield, and sediment delivery corridors. Measurements were taken adjacent to the watercourse and further from the watercourse outside the plots. Some measurements were not successful: soil strength, surface fuel, and regenerative success of planted pine species. Pre-treatment measurements were taken in 1997 (historical data because the plots were existing, permanent plots), and also 2007 and 2016. Commercial thins were conducted from 2018–2021, and post-commercial thin measurements and fuel treatments were conducted as possible thereafter.

Results

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- **Light availability (%TTR):** ANOVA showed an increase in degree of light input moving from Treatment 2 (Status Quo) to Treatment 3 (Fuel tx) and to Treatment 4 (Fuel tx+gaps), but post-hoc comparisons suggest no significant difference between the Status Quo and Fuel tx, although there was a difference between those and Fuel tx+gaps. Overall, light input was still low given that 40% TTR is the minimum requirement for Ponderosa pine regeneration, and all light inputs were below 40%. Light input did increase after all treatments in Treatments 2, 3, and 4. The edges of treatments had higher light inputs, but patterns were similar as within the treatment plots adjacent to the watercourse.
- **Yield and Revenue:** Status Quo (removal of 5 trees per acre [tpa]) did not yield nearly as much timber as Fuel tx (51 tpa) and tx+gaps (52 tpa); it is a huge difference, at 1.4 million board feet (MBF)/acre in Status Quo, versus 9.9 MBF in the Fuel tx+gap. Yield increase was from more trees being removed, not from bigger trees being removed. Given the differences in assumed net revenue rates, the assumed net was about ten times higher in the Fuel tx+gap compared to the Status Quo.
- **Sediment Transport Corridors:** STC was defined as evidence of sediment delivery into the channel, and was attributed to either: burn scars, fine line construction, road crossings, or matrix (any other location in WLPZ). The Mosquito Fire prevented some of the measurements. Of 11 possible STCs detected, four were in Treatment 1 (Control), two were in the Status Quo, and four were in Treatment 4 (Fuel tx+gap), but only one was confirmed as real coming from a fire scar and was in a Treatment 4 plot.

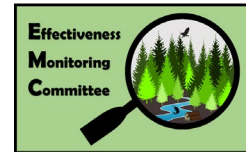
Management Implications

- **Light availability (%TTR):** In riparian zones, if the goal is to reduce fire hazard while minimizing light input (e.g., you don't want more light and want to minimize changes to water temps), then thinning without gaps works (Fuel tx); if the goal is to reduce fire hazards, create heterogeneity, and create a severe enough disturbance to increase light inputs and regenerate shade intolerants (e.g., Ponderosa pine, alder), then you will likely need larger gaps and/or more intense thinning than was tested in this study (i.e., some *more intense* combination of Fuel tx+gaps); if the goal is to only increase heterogeneity without increasing light inputs substantially, the Fuel+tx approach works.
- **Yield and Revenue:** The increased yield from the increased fuel treatment costs in the more heavily treated plots more than offsets the cost of the treatments. This suggests potential for economic sustainability.
- **Sediment Transport Corridors:** They hope to do the surveys again in 2023. There are not enough data to support statistical analyses, but it was surveyed more to just see if there were general trends.

They were unable to conduct stream temperature change data collection because the costs were too high, and they went way over budget early on. They had also hoped to plant and

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measure pine in gaps but could not. They could still measure post-treatment soil strength and fuel loads, but that is not planned at this time.

They expect a manuscript to come out of this research, and Dr. York will do a Board presentation on this in March. They are considering a Phase 2, and some discussions have happened at Flatwoods and the Latour Demonstration State Forest. They hope this will inform policy and regulatory development, and can be further developed in future research.

Member Comments

Member Coe asked if they have reference sites to look at as examples of pre-Western treatment of forests looked like in riparian corridors. Dr. York said that they would have to occur in areas where we have not conducted fire suppression, but there are very few of those, and of those, they are at very high elevations. There are no comparisons in analogous ecosystems that have intact fire regimes. Member Coe also noted other EMC-supported research about canopy gaps and patchy riparian zones and how that affects aquatic ecosystems. He sees this work as being very synergistic.

Member Waitman asked: 1) In future work, are you planning to include additional measures of sediment delivery and stream temperature? And 2) Some of the gaps are probably now about 5 years old; how long does the reduction in light availability persist, and could it be transitory enough to not substantially increase stream temperatures? Dr. York answered that it would be great to measure stream temperature, but notes that it can be hard to detect changes that can be interpreted as an impact of canopy reduction. It is relevant to think about if the light increase is permanent or transitory, because there will be some recovery, even within ¼ acre opening because there is encroachment from surrounding edge trees and recruitment. It would be dynamic, and that is relevant. Light availability five years later is going to be later, unless some other disturbance occurred since.

Member Coe noted that the literature on RFIs makes a compelling case for incorporating disturbance concepts into riparian management. He does struggle with the wicking effects in streams, and the impetus for management in this way could be bolstered by studying that. He also asked if Dr. York wonders if the treatments traded one type of hazard for another, and it would be good to look at surface fuels in these treatments. Dr. York noted that wicking hasn't been experimentally studied or shown that it is a real effect. As for the surface fuels, he noted they did a legitimate surface fuels treatment, but they just need to take more measurements to show definitively and quantitatively that they did. He doesn't believe they traded one hazard for another; he believes they reduced fuel loads, and any fuel behavior model would show they reduced fire severity. Member Coe suggested that representative photo points could be used to compare treatments, even if surface fuels data couldn't be collected.

9) Review EMC Member Application(s) – Dr. Wolf, Board staff

Dr. Wolf shared the application materials from Jonathan Meurer, who was nominated by the Central Valley Regional Water Quality Control Board (CVRWQCB) to replace Justin LaNier:

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[Interest Letter](#) and [Resume](#). Co-chair Moreno noted the application is in order and believes Jonathan would be a great addition to the committee, and would recommend they proceed to comment or vote. Jonathan noted that

A motion was made to recommend appointment of Jonathan Meurer to represent the CVRWQCB on the EMC by Member Waitman; this was seconded by Member O'Connor. There was no discussion.

Roll Call Vote

Drury	absent
Waitman	Aye
Leonard	Aye
Coe	Aye
Hostler	Aye
Short	Aye
Burke	absent
Jones	Aye
Nannizzi	Aye
Chinnici	Aye
O'Connor	Aye
Love-Anderegg	absent at time of vote
Freer-Smith	Aye
Forsburg-Pardi	Aye
Moreno	Aye

The motion passes unanimously with 11 Ayes. The recommendation will be sent to the Board for its review and vote in the March Board meeting.

10) Public Forum

Public Comment from Richard Gienger: AB 1492 became law in 2012 with a focus on forest recovery, and he thinks this has been forgotten by the EMC which has been tied to the implementation of that legislation, and he doesn't feel it hasn't been happening. He also thinks many people would find a book by Tom Harris to be interesting, called Stand for the Land. Co-chair Moreno acknowledged his comment and noted that the legislature has provided to the CNRA resources to get work done in the ecological performance measures arena, and she will keep the EMC updated on this process.

11) Future Meeting Locations, Dates, and Agenda Items

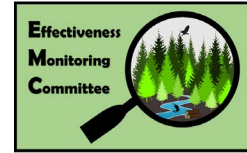
Please submit agenda items by early May via email to Dr. Wolf.

Next Meeting Dates: Tuesday, June 7th, 2023 and Wednesday, August 2nd, 2023

The June meeting will be fully virtual, but the August meeting may be in person unless a member wants to notice their location. We should know by July 1 about the August meeting.

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12) Announcements: Scientific Conferences, Symposiums, and Workshops

- Upcoming Joint Range Conference with the Range Management Advisory Committee and California Rangeland Conservation Coalition, Friday <https://carangeland.org/crcc-2023-summit/>; this will be an in-person meeting at the Stockton Robert Cabral Ag Center with a virtual option for the morning only.
- Range Management Advisory Committee meeting at the same location the day before, 2/23/2023, 12:30 PM. In-person and virtual options are available; all registrations should go through this link: <https://register.gotowebinar.com/register/7976436118197970446>
- Annual Salmonid Restoration Conference is April 25-28, 2023: <https://www.calsalmon.org/conferences/40th-annual-salmonid-restoration-conference>
- Member Coe announced that the Annual Caspar Creek meeting is June 13–14, with two four hour sessions, including remote presentations. The 15th is the last day and is a field tour.

13) Adjourn