

***2019 EFFECTIVENESS
MONITORING COMMITTEE
ANNUAL REPORT AND
WORKPLAN***



**STATE BOARD OF FORESTRY AND FIRE
PROTECTION**

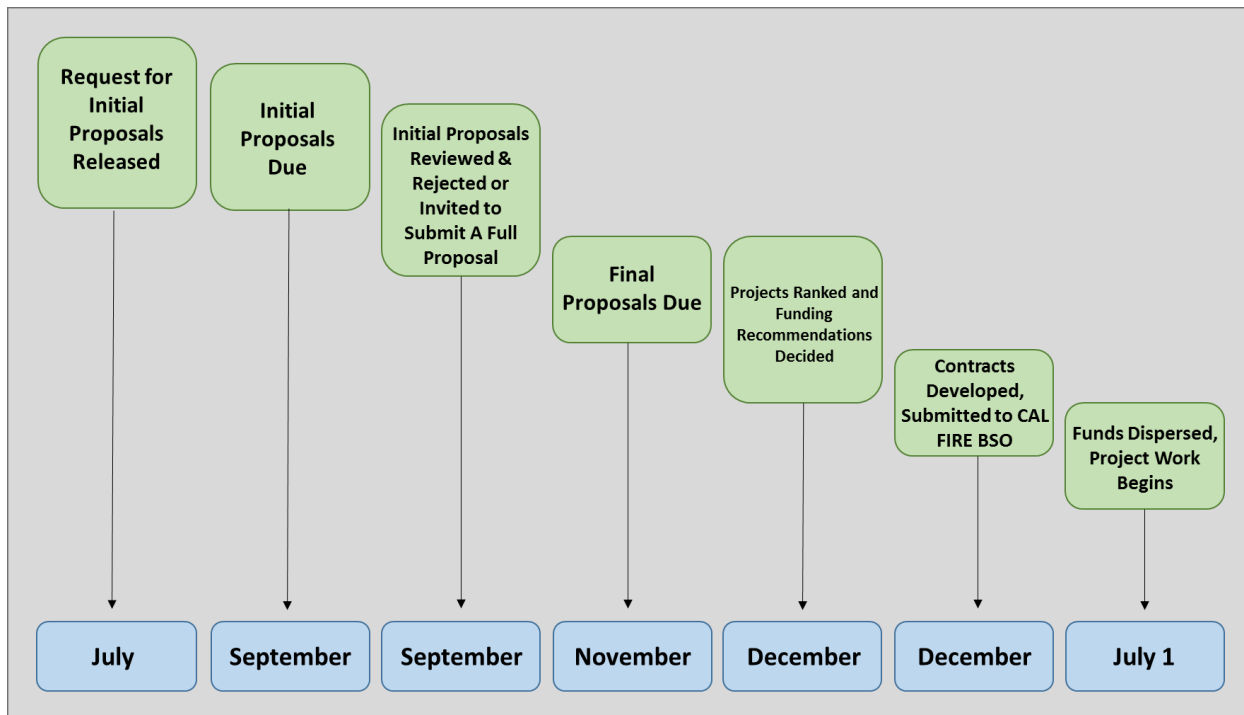
December 5, 2019

EXECUTIVE SUMMARY

The Effectiveness Monitoring Committee (EMC) Annual Report and Workplan is a living document which is updated and approved by the Board of Forestry and Fire Protection annually and is intended to catalogue the yearly accomplishments and status of ongoing EMC efforts. The Annual Report and Workplan summarizes EMC accomplishments, details EMC funding actions for the year, and provides an update of current EMC membership and staffing. Funding details include information on all projects submitted to the EMC, regardless of whether they are selected for funding. For fiscal year¹ 2018/2019, the EMC selected two proposed effectiveness monitoring projects to fund and support. Five additional projects were received for consideration in fiscal year 2019/2020.

EMC PROCESS SUMMARY

Project Submission Timeline (approximate)



The EMC Strategic Plan will be updated approximately every three years and the EMC Annual Report and Work Plan will be updated every calendar year. This linked approach, including a longer more static document and a shorter more fluid document, was developed in response to Board member suggestions.

EMC projects are solicited through an annual Request for Proposals (RFP) which is released following the start of the new fiscal year. Initial Concept Proposals are received in September and

¹ Fiscal year denotes from the July 1st of one year to July 1st of the next. The State of California uses this time frame for tax and accounting purposes.

the EMC conducts a preliminary technical review of all Initial Concept Proposals that are received by the deadline (established annually in the RFP). This review considers the completeness of the proposals and whether they are within the scope of the Themes and Critical Monitoring Questions elaborated in the Strategic Plan. The EMC also works with Board staff to screen proposals for any conflicts of interest and may request that the Principal Investigator provide additional information within a reasonable period.

When the EMC determines that an Initial Concept Proposal is complete and within scope, the Principal Investigator is invited to submit a Full Project Proposal by the deadline specified in the RFP. The EMC then conducts a thorough technical review of all Full Project Proposals that are received and a formal ranking is conducted according to the procedures outlined in the EMC's Strategic Plan. EMC members individually rank each project and the average ranking score is calculated for each project. No specific minimum average ranking score is required for support; rather, individual project scores will be considered relative to other project scores. Once all Full Project Proposals have been ranked, EMC members vote to make recommendations for allocation of available EMC funds, taking into consideration the project ranking score, how well the project tests the effectiveness of the FPRs, and the reasonableness of the requested budget. Utilizing the EMC's funding recommendations, Board staff will make the final funding decisions, as delegated by the Board. It is the intent of the EMC to keep the ranking process transparent, with the ranking done in an easily trackable manner. The EMC receives periodic updates on the projects that have received funding and presentations on findings from completed projects.

EMC FUNDING

For fiscal year 2019/2020, the EMC has been allocated ongoing funding of \$425,000 per year from the Timber Regulation and Forest Restoration Fund (TRFRF),² established by AB 1492 (2012). This funding is being used to support EMC projects and is granted through the Board/CAL FIRE contracting process.

EMC ACCOMPLISHMENTS

During 2019 the EMC accomplished the following:

- Received an ongoing allocation of \$425,000 from the Timber Regulation and Forest Restoration Fund.
- Re-appointed Board Member Susan Husari as EMC Co-Chair.
- Appointed Loretta Moreno, CNRA, as EMC Co-Chair.
- Re-appointed Dr. Matt O'Connor to the EMC as a Public member.
- Recruited 3 Academic Members to the EMC: Dr. Sarah Bisbing, Dr. Leander Anderegg, and Dr. Peter Freer-Smith.
- Regularly met in open, webcast public meetings to conduct its work.
- Utilized the project ranking procedure included in the EMC Strategic Plan to select two (2) proposed effectiveness monitoring projects to fund and support (Table 1).

² http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201120120AB1492.

- Made determinations on total project funding for each submitted project, and developed contracts for the two funded projects.
- Revised the EMC Request for Proposals with the support of a two-person sub-committee.
- Developed new standard initial concept proposal and full concept proposal forms for potential principal investigators to use when submitting their projects to the Committee for review. These forms can be found on the [EMC's webpage](https://bof.fire.ca.gov/board-committees/effectiveness-monitoring-committee/) (https://bof.fire.ca.gov/board-committees/effectiveness-monitoring-committee/).
- Developed and released a Request for Proposals (RFP) soliciting monitoring project initial concept proposals. Proposals were due to the EMC by September 7, 2019.

Table 1. EMC Projects Ranked and Funded (2018/2019)

Project #	Project Title	Primary Investigator & Project Collaborators	Ranking Score	EMC Funding Allocation
EMC-2018-003	Alternative Meadow Restoration	Dr. Christopher Surfleet with collaboration from Blodgett Demonstration State Forest and The Plumas Corporation	17.9	\$101,802.00
EMC-2018-006	Class II Watercourse and Lake Protection Zone	Dr. Kevin Bladon, Dr. Catalina Segura, Dr. Matthew House, and Drew Coe with collaboration from Green Diamond Resource Company and CAL FIRE	16.2	\$694,371.00

Table 2. EMC Projects not Ranked and/or Funded (2018/2019)

Project	Project Title	Primary Investigator	Ranking Score	Reason
EMC-2018-001	14 CCR Section 1038(j) Exemption Monitoring	Joe Barren, RPF	N/A	Revised project proposal requested
EMC-2018-002	Spotted Owl Use of Post-Fire Landscapes	J. David Wiens	10.64	Revised project proposal requested
EMC-2018-004	Tracked Feller Bunchers in the WLPZ	Dr. Kevin Lyons	9.27	Revised project proposal requested
EMC-2018-05	Characterizing Amphibian Distribution	Lynn Webb	N/A	Project Outside Scope of EMC
EMC-2018-07	Effects of Experimental Site Exclusion on Pacific Martens	Dr. Katie Moriarty, Dr. Jake Vershuyl, and Matthew Delheimer	12.7	Revised project proposal requested

EMC SUPPORTED MONITORING PROJECTS – 2015 to 2018

The comprehensive list of EMC supported monitoring projects can be found on the Board’s [EMC webpage](https://bof.fire.ca.gov/board-committees/effectiveness-monitoring-committee/) (https://bof.fire.ca.gov/board-committees/effectiveness-monitoring-committee/)

EMC PRIORITIES

EMC priorities are developed by the Committee, but as an advisory body to the Board, the Board can also request prioritization of items by the EMC. The current EMC Priorities are as follows:

- Consider the project proposals received during the 2019 EMC RFP cycle using the EMC review and ranking process.
- Support projects related to the EMC themes and critical questions, through funding or other appropriate means.
- Monitor progress on previously funded or -supported EMC monitoring projects.
- Meet in the field at least once per year to observe active or proposed monitoring projects.

SUMMARY OF SUBMITTED PROJECTS FOR CONSIDERATION BY JANUARY 2020

The following summary table is a catalog of monitoring projects under consideration by the Effectiveness Monitoring Committee. For individual Project Summary(s) and concept proposals that provide more detailed project information, see the [EMC website](https://bof.fire.ca.gov/board-committees/effectiveness-monitoring-committee/) (https://bof.fire.ca.gov/board-committees/effectiveness-monitoring-committee/).

Table 3. Summary of Projects Under Consideration for Ranking and/or Funding by February 2020.

Project Number	Project Title	Current Status	Principal Investigator(s)
EMC-2019-001	Assessing the Connectivity of Black-backed Woodpecker Populations in Green and Burned Forest within a Fire-prone Landscape	Awaiting Committee Review	Dr. James Rivers, Dr. Jake Vershuyt
EMC-2019-002	Evaluating Treatment Longevity and Maintenance Needs for Fuel Reduction Projects Implemented in the WUI of Plumas County, CA	Awaiting Committee Review	Jason Moghaddas, RPF, Gary Roller, RPF, and Hannah Hepner
EMC-2019-003	Fuel Treatments and Hydrologic Implications in the Sierra Nevada	Awaiting Committee Review	Dr. Terri Hogue and Dr. Alicia Kinoshita
EMC-2019-004	Drafting Bypass Flows and their Effects on Native Fish: Linking Forest Practice Rules to Fish and Game Code	Awaiting Committee Review	Dr. Robert Lusardi, Dr. Andrew Rypel, Dr. Nann Fangue

Project Number	Project Title	Current Status	Principal Investigator(s)
EMC-2019-005	Sediment Monitoring and Fish Habitat – San Vicente Accelerated Wood Recruitment	Awaiting Committee Review	Cheryl Hayhurst, CGS

CURRENT EMC APPOINTED MEMBERS AND STAFF

For FY 2019/2020, the Committee has two Co-Chair positions, eight agency representatives, seven EMC Members, and five support staff.

Table 4. Current EMC Membership and Support Staff.

Name	Specialty	Affiliation	Term Expiration
Co-Chairs			
Loretta Moreno	Co-Chair, Forest Ecology	California Natural Resources Agency	7/5/2023
Susan Husari	Co-Chair, Forestry/Fire Management	Board of Forestry and Fire Protection	11/6/2023
Agency Representatives			
Stacy Drury, Ph.D.	Fire Ecology	USDA Forest Service Pacific Southwest Research Station	n/a
Elliot Chasin	Wildlife	California Department of Fish and Wildlife	n/a
Drew Coe	Hydrology/Forestry, RPF 2981	CAL FIRE	n/a
Cliff Harvey	Water Quality/Hydrology	State Water Resources Control Board	n/a
Justin LaNier	Geology/Hydrology/Water Quality	Central Valley Regional Water Quality Control Board	n/a
Clarence Hostler	Fisheries	NOAA National Marine Fisheries Service	n/a
Bill Short	Engineering Geology/Hydrogeology	California Geological Survey	n/a
Jim Burke	Geology/Water Quality	North Coast Regional Water Quality Control Board	n/a
Monitoring Community			
Greg Giusti	Forestry, RPF 2709	University of California Cooperative Extension Advisor Emeritus-Lake and Mendocino counties	7/1/2021

Name	Specialty	Affiliation	Term Expiration
Matt House	Hydrology/Fisheries	Green Diamond Resource Company	8/31/2020
Sal Chinnici	Wildlife	Humboldt Redwood Company	7/1/2020
Matt O'Connor, Ph.D.	Geology/Geomorphology	Public	11/6/2023
Sarah Bisbing, Ph.D.	Forest Ecology/Forestry	Academic, University of Nevada, Reno	7/5/2023
Leander Anderegg, Ph.D.	Forest Ecology/Forestry	Academic, University of California, Berkeley	7/5/2023
Peter Freer-Smith, Ph.D.	Plant Ecology and Environmental Policy	Academic, University of California, Davis	7/5/2023
Support Staff			
Matt Dias	Forestry, RPF 2773	Board of Forestry and Fire Protection Executive Officer	n/a
Pete Cafferata	Hydrology/Forestry, RPF 2184	CAL FIRE	n/a
Stacy Stanish	Biology/Fisheries, RPF 3000	CAL FIRE	n/a
Dave Fowler	Geology/Water Quality	North Coast Regional Water Quality Control Board	n/a
David Ludwig	Forestry	Board of Forestry and Fire Protection	n/a
Brandi Goss	Biology/Environmental Science	Board of Forestry and Fire Protection	n/a

EMC PROJECT UPDATES

- **EMC-2015-001: Class II-Large Monitoring (ongoing)**: Oregon State University Master of Science (MS) student Adam Pate selected three main areas to implement the regional scale component of the Class II Large watercourse study, which assessed the effectiveness of rule criteria for identifying Class II watercourses susceptible to thermal loading. Field work took place during the summer of 2018 in three Jackson Demonstration State Forest watersheds, two upper Klamath River basins, and the Cow Creek watershed (South Cow Creek on LaTour Demonstration State Forest). A total of at least 100 sites were being studied. Data analysis included the use of LiDAR and NetMap data. Adam Pate defended his thesis in the Summer of 2019. Drs. Catalina Segura and Kevin Bladon will be turning Adam's thesis into a manuscript to be submitted to a peer reviewed journal in 2020. PhD student Austin Wissler will be analyzing the thermistor data from Caspar Creek and Latour Demonstration State Forest as the first part of his dissertation research.
- **EMC-2015-002: Forest Practice Rules Implementation and Effectiveness Monitoring (FORPRIEM) ver. 2.0.**: A [final statistical consultation report for EMC-2015-002](#) was written by Dr. Ashley Steel and Pat Cunningham, USFS Pacific Northwest Research Station (PNW) and submitted to the EMC. No further work has progressed to date.
- **EMC-2015-004: Effectiveness of Road Rules in Reducing Hydrologic Connectivity and Significant Sediment Discharge (completed)**: A [final statistical consultation report for EMC-2015-004](#) was written by Dr. Ashley Steel and Pat Cunningham, USFS Pacific Northwest Research Station (PNW) and submitted to the EMC. No further work has progressed to date.
- **EMC-2016-002: Post-fire Effectiveness of the Forest Practice Rules in Protecting Water Quality on Boggs Mountain Demonstration State Forest (ongoing)**: Data collection will continue for a 5th post-fire season. A BMP demonstration project was implemented to test different erosion control measures on skid trails. Testing was done using a runoff simulator and a flow rate calibrated from previous runoff simulations was performed on skid trails at BMDSF. Six replicates of five different treatments were tested including: 1) control; 2) increasing waterbreak frequency; 3) slash packed; 4) slash packed and walked-in with equipment; and 5) slash packed waterbreak outlets. The first of the two rainfall simulation experiments (i.e., lab-based rainfall simulations) was published in the Journal of Hydrology.
- **EMC-2016-003: Road Rules Effectiveness at Reducing Mass Wasting (Repeat LiDAR Surveys to Detect Landslides) (ongoing)**: The CAL FIRE/CGS contract has been augmented to purchase LiDAR. Once completed, the LiDAR data will be publicly available from the USGS. The Pilot project data is expected to be available for review in mid-January, 2020 with the complete project area available for review at the end of March, 2020 and final data available at the end of July, 2020.
- **EMC-2017-001: Caspar Creek Nutrient Study (ongoing)**: UC Davis MS student Seanna McLaughlin and Drs. Helen Dahlke and Randy Dahlgren prepared a [final report for pre-](#)

[harvest biogeochemical analysis](#) of four Caspar Creek sub-watersheds for the Save the Redwoods League, one of the project funders. A bromide/nitrate stream injection took place during September of 2018, allowing the characterization of in-stream nitrogen dynamics (data analysis ongoing). Sub-watershed logging was completed during November 2018, and the first winter post-logging water samples have been analyzed. Seanna McLaughlin has nearly completed her thesis work and is expected to graduate by March 2020. UC Davis will conduct post-logging nutrient sampling and sample analysis through the 2019/2020 winter period, but it is unclear whether these data will be included in the final report to CAL FIRE and the Board of Forestry and Fire Protection.

- **EMC-2017-002: Boggs Mountain Demonstration State Forest (BMDSF) Post-Fire Automated Bird Recorders Study (ongoing)**: The second year of bird recordings were made in the late spring of 2018 and the bird call expert is currently interpreting the recordings. Stacy Stanish prepared a poster for the Western Section of the Wildlife Society Meeting held in February 2018. She also presented the study and preliminary results to the CARCD Annual Conference "Celebrating Resilient Landscapes and Adaptive Communities" in San Diego in November, 2018.
- **EMC-2017-004: Monitoring Class III Watercourses (ongoing)**: Equipment for this project has been purchased by BOF and CAL FIRE staff, including 120 Onset temperature loggers. No further work has progressed to date.
- **EMC-2017-006: Tradeoffs Between Riparian Buffers, Fire, and Regeneration (ongoing)**: Dr. Rob York, UC Berkeley, has implemented this project on Blodgett Forest Research Station. Feller bunchers and skidders have been used in Class I and II WLPZs; logging slash has been hand piled for burning. Parameters being measured include soil strength (index of soil compaction), species composition/structure, fuel loading, canopy cover/light availability, water temperature, and stream sediment. In 2019, eight additional riparian zones were treated. This included all three of the treatment alternatives (status quo-directional felling; thin from below with equipment; thin from below plus gap creation with equipment). Pre-treatment measurements and plot installation occurred in the summer of 2019. Post-harvest treatment of activity fuels is occurring in the fall of 2019 and the spring of 2020. Post-treatment measurements will occur in the summer of 2020. This will conclude the measurements needed for "phase 1" of the study. A report and publication is planned for the winter/spring of 2021.
- **EMC-2017-007: The Life Cycle of Dead Trees and Implications for Management (ongoing)**: Dr. John Battles, UC Berkeley, has implemented this project on Blodgett Forest Research Station. The 2018 snag inventory in compartment 160 was updated using a 40-m grid to map snags with GPS. An additional component of the project, a long-term study of downed wood decay rates, has been implemented using eight log decay sites (e.g., "log cemeteries") in compartment 160 and four functional groups of trees (fir, pine, oak and cedar). Log density and volume will be measured over the next 20 years.
- **EMC-2017-008: FPRs to Minimize Fir Mortality from Root Diseases (ongoing)**: The root disease control experimental site was identified and analysis of an existing long-term root disease and bark beetle monitoring plot dataset has been completed. Pre-treatment tree

measurements have occurred in addition to identification of local strains of *Phlebiopsis gigantea* and growth of *P. gigantea* and *Heterobasidion occidentale* isolates. Establishment of the standing-tree wounding experiment and the stump treatment experiment has occurred as well as a resurvey of the long-term root disease and bark beetle monitoring plot network. A replicate field experiment using wood blocks in the laboratory will commence in 2020.

- **EMC-2017-012: Bat Study on Demonstration State Forests (ongoing):** Eight acoustic detectors were deployed at forested upland sites on Jackson Demonstration State Forest (JDSF) in May of 2019. Four sites were sampled within the James Creek (Road 100) area and 4 sites were sampled within the Chamberlain Creek (Road 200) area, both north of Highway 20, near the eastern extent of JDSF. Insect trapping, targeting moths (by using “ultraviolet light traps”), was conducted at each of the 8 study sites for one night each month in May, June, and July but sampling was reduced to trapping at 4 sites each month (divided systematically among site classifications) in August, September, and October to reduce the number of samples collected and processed. An annual project progress report will be produced in early 2020 to provide summary information regarding preliminary data analyses. This project is scheduled to continue at other Demonstration State Forests in each of the 2020, 2021, and 2022 summer seasons.
- **EMC-2018-003: Alternative Meadow Restoration (ongoing):** Instrument installation occurred in July, 2019 and monitoring has begun. Meadow restoration implementation will occur in spring and summer 2020 and will continue through spring 2022.
- **EMC-2018-006: Class II Watercourse and Lake Protection Zone (ongoing):** Drs. Kevin Bladon and Catalina Segura launched this four year project, in collaboration with Green Diamond Resource Company, during summer 2019. Launching of this project involved several critical steps that will ensure long-term success of the project. First, spatial analysis was completed to narrow down the potential study watersheds from >60 to ~30. All sites were then visited multiple times to confirm and collect site description data on drainage area, aspect, active channel width, gradient, dominant canopy cover, and site access. These data were used to facilitate selection of 18 watersheds to include in the study—6 reference watersheds and 4 of each of the three riparian treatments. Watersheds will be harvested in 2020 with one of the three treatments: (a) Coastal Anadromy Salmonid Protection Zone Class II-L Prescription (30 ft core zone, 70 ft inner zone with 80% overstory canopy cover), (b) Green Diamond Resource Company 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 (100 ft zone with 50 % overstory canopy). In summer 2019, we established six circular fixed area plots in the riparian area of each watershed to quantify tree condition, species, diameter at breast height, basal area, and canopy closure (from hemispherical photographs). At the outlet of each of the 18 streams a pressure transducer was installed to measure stream elevation to calculate discharge, a dissolved oxygen sensor, and a photosynthetically active radiation sensor. Longitudinally, along each of the 18 streams we installed four air temperature sensors, and 12 stream temperature sensors (288 total sensors). All automated sensors have been set up to collect data at 15 minute intervals. We also successfully recruited a PhD student, Austin Wissler, who started working on the project in August 2019. Austin has already begun preliminary

QA/QC of the first summer of data and will soon begin preliminary analyses to assess the comparability of the sites in the pre-harvest period. Along with Drs. Bladon and Segura, he will continue to oversee collection and maintenance of this critical pre-harvest and post-harvest data.

EMC PROJECT RESULTS AND PRODUCTS

EMC-2015-002 Forest Practice Rules Implementation and Effectiveness Monitoring (FORPRIEM) ver. 2.0. A [final statistical consultation report for EMC-2015-002 and EMC-2015-004](#) was written by Dr. Ashley Steel and Pat Cunningham, USFS Pacific Northwest Research Station (PNW) and submitted to the EMC.

EMC-2015-004 Effectiveness of Road Rules in Reducing Hydrologic Connectivity and Significant Sediment Discharge. A [final statistical consultation report for EMC-2015-002 and EMC-2015-004](#) was written by Dr. Ashley Steel and Pat Cunningham, USFS Pacific Northwest Research Station (PNW) and submitted to the EMC.

EMC-2016-002: Post-fire effectiveness of the Forest Practice Rules in protecting water quality on Boggs Mountain Demonstration State Forest. A manuscript titled “Hydrologic and erosive responses of compaction versus cover in post-fire logged areas Part I: Isolating the key factors” was submitted to the Journal of Hydrology by Drs. Sergio Prats and collaborators. The study used soil collected from BMDSF and replicated post-fire salvage logging conditions and practices in a laboratory setting.

Two reports have been produced for this project:

- [Will Olsen’s 2016 Master of Science Thesis, Michigan Tech, is titled: “Effects of Wildfire and Post-Fire Salvage Logging on Rill Networks and Sediment Delivery in California Forests”.](#)
- [Drew Coe’s presentation abstract for the 2016 Geological Society of America Cordilleran Section 112th Annual Meeting titled “Post-Fire Erosion and Sediment Delivery Rates to Headwater Streams in the California Coast Ranges”.](#)

EMC-2017-001 Caspar Creek Nutrient Study: UC Davis MS student Seanna McLaughlin and Drs. Helen Dahlke and Randy Dahlgren prepared a [final report for pre-harvest biogeochemical analysis](#) of four Caspar Creek sub-watersheds for the Save the Redwoods League, one of the project funders.

EMC-2017-002 Boggs Mountain Demonstration State Forest (BMDSF) Post-Fire Automated Bird Recorders Study: A poster and poster abstract were prepared for the Western Section of the Wildlife Society Meeting held in February 2018.

POTENTIAL EMC PROJECT IMPACTS TO REGULATIONS

The EMC provides valuable insight to the Board on testing the effectiveness of their rules and regulations by way of science-based research projects. EMC funded studies may have the ability to show that regulatory modifications, either minor or major, need to occur to ensure the effectiveness of the Forest Practice Rules (14 CCR § 895 et seq.). At this time, EMC funded projects have not identified any rulemaking possibilities.