Effectiveness Monitoring Committee -
Completed Research Assessment for EMC-2019-002: Evaluating Treatment Longevity and Maintenance Needs for Fuel Reduction Projects Implemented in the Wildland Urban Interface of Plumas County, CA

EMC Members:

Drew Coe – CAL FIRE, Watershed Protection Program

Dr. Stacy Drury – United States Forest Service, Pacific Southwest Research Station

1. Does study fulfill and address scientific question(s) posed in proposed research?

No. The study was unable to rigorously answer the majority of questions proposed to be addressed in the original scope of work. Many answers to the questions were qualitative only, with no supporting quantitative data. These questions included ones from EMC's 2018 Strategic Plan.

Are the Forest Practice Rules effective in:

1. Treating post-harvest slash and slash piles to modify fire behavior?
2. Treating post-harvest slash and retaining wildlife habitat structures, including snags and large woody debris?
3. Managing fuel loads, vegetation patterns, and fuel breaks for fire hazard reduction.

In addition, several other questions were proposed in the initial scope of work including:

1. How many years are fuel reduction treatments in the WUI effective for?
2. Is there a variation in treatment effectiveness over time by vegetation type, type of treatment, or equipment used?
3. What are the potential maintenance needs for existing treatments and at what treatment age?

The primary investigators (PIs) were unable to implement their proposed methods which was reliant on LiDAR acquisition and UAV-obtained point cloud data. Instead, the PIs leveraged data from SALO's California Forest Observatory, Region 5 Funded Community Wildfire at Risk Information, and USFS burn severity data for the North Complex and Dixie Fires.

A. Does the study inform a rule, numeric target, performance target, or resource objective?

No. The study does not rigorously inform a rule, numeric target, performance target, or resource objective.

B. Does the study inform the Forest Practice Rules?

ii) **No.** All results pertaining to the Forest Practice Rules are qualitative only, with no quantitative data as supporting evidence. Perhaps the biggest shortcoming of the study is that it is impossible to determine which projects were subject to Forest Practice Rules and which ones were subject to other regulatory requirements outside of the Forest Practice realm.

2. Is the study scientifically sound?

A. Was the study carried out pursuant to valid scientific protocols (i.e., study design, peer review)?

No. The study was not peer reviewed. The study design appeared robust in the proposal, but the PIs did not implement the proposed protocol during project implementation. Furthermore, many of the results relevant to the study questions are qualitative only, with little quantitative supporting evidence.

3. Is the study scalable?

A. What does the study tell us? What does the study not tell us? Do findings apply to other areas of the state?

This study tells us average values for modeled Forest Observatory canopy cover data (i.e., canopy cover) within and adjacent to treated project areas. Average values for modeled flame lengths as per the Wildfire Communities at Risk dataset are also presented within and adjacent to treated project areas. Proportion of area by burn severity class was also calculated within and adjacent to treated project areas. None of this data was validated with field measurements within the treated areas. All data can be obtained publicly.

The study tells us nothing about the effectiveness of the Forest Practice Rules (FPRs), primarily because we don't know the number of projects subject to FPRs and associated regulations. Furthermore, we do not see a systematic comparison of key metrics (e.g., potential flame length) for areas subject to FPRs versus untreated areas or areas treated through other permitting vehicles. Generally, effectiveness is not quantitatively related to vegetation type, treatment type, and equipment use. Maintenance needs are gleaned from literature published in 2015 and earlier, with no site-specific quantitative data within or adjacent to the project areas.

Findings do not apply to other areas of the state, because it is difficult to apply qualitative findings to areas that may differ in terms of vegetation types, treatment constraints, and potential fire behavior. The overreliance on relatively coarse scale remote sensing analysis means that it's difficult to definitively link specific practices and/or FPRs to modifications in potential fire behavior related to surface, ladder, or crown fuels.

4. More Research Needed?

A. Literature Review Sufficient? – Maybe. Data from cited works are often times substituted for data that was supposed to be collected in the original scope of work.

B. Further Funding Needed? - Not for this study. Since this study was unable to answer the majority of questions posed in the original scope of work, the committee should not allocate more funding for this work.

C. What is the relationship between this study and any others that may be planned, underway, or recently completed?

i. **Feasibility of obtaining more information to better inform policy about resource efforts –** It is feasible to obtain more information through the implementation of studies with more field-based measurements. While remote sensing based studies can answer a myriad of questions, determining the effectiveness of specific operational provisions and requirement of FPRs ultimately requires some field validation. In general, no data from field validation is presented in this report except for qualitative statements.

ii. **Are other relevant studies planned, underway, or recently completed? (If yes, what are they?** CAL FIRE's Watershed Protection Program has released three monitoring reports on Exemptions related to fire hazard reduction. This includes reports on the:

- § 1038 (c) – 0 to 150 foot structure protection exemption (Olsen and Coe, 2021);
- § 1038 (c)(6) – fire hazard reduction within 300 feet of residences exemption (Olsen and Coe, 2021b); and
- § 1038.3 – Forest Fire Prevention Exemption (Olsen and Coe, 2022).

All three studies employed probabilistic sampling along with systematic and objective field-based measurements of surface, ladder, and crown fuels. As such, they provide a quantitative assessment of effectiveness for fuel treatment practices required under the Forest Practice Rules.

In addition, there are several EMC-funded studies directly and/or indirectly related to the effectiveness of the FPRs for fuels-related treatments. This includes EMC-2022-005, titled "Decay Rates and Fire Behavior of Wood Debris in Coastal Redwoods." There are also two EMC projects that look at the consequence of fuels treatments on the response of native pollinators (EMC-2021-003) and on the water balance (EMC-2019-003)

iii. **What are the costs associated with additional studies?** These studies mentioned above are or have been funded for $696,453.

iv. **What will additional studies help us learn?** EMC-2022-005 is poised to tell us about the potential fire behavior for lopped and scattered slash, as the well as how wood decay can affect potential fire behavior over time. This is a relevant topic for the coastal redwood and Douglas fir belt, given that monitoring for the Forest Fire Prevention Exemption indicated the challenge of slash management in these higher biomass forest types.

v. **When will these additional studies be completed (i.e., when will we learn the information)?** The results of EMC-2022-005 will be available in 2025.

vi. **Will additional information from these other studies reduce uncertainty? - Yes**. EMC-2022-005 will reduce uncertainty regarding the relationship between wood decay and potential fire behavior following timber harvest.

5. **Scientific Applications - What is the scientific basis that underlies the rule, numeric target, performance target, or resource objective that the study informs? How much of an incremental gain in understanding do the study results represent?**

   This study informs no rule, numeric target, performance target, or resource objective associated with the Forest Practice Rules with quantitative data. As such, it leads very little to our knowledge regarding the effectiveness of the Forest Practice Rules in terms of managing fuel loads or post-harvest slash accumulation.

References:

Olsen, W., and Coe, D. 2021. "Report on Exempt Timber Harvesting for the Reduction of Fire Hazard Within 150 Feet of Structures And Non-Discretionary Timber Harvest Notice Use and Rule Compliance". California Department of Forestry and Fire Protection and State Board of Forestry and Fire Protection. Sacramento, CA. 41 p. plus Appendices. bof.fire.ca.gov/media/lm3lxh30/report-on-exempt-timber-harvesting-for-the-reduction-of-fire-hazard-within-150-feet-of-structures_ada.pdf

Olsen, W., & Coe, D. (2021b). "Beyond Zone 1: Monitoring of Fire Hazard Reduction Within 300 Feet of Residences Through Timber Harvest with the §1038(c)(6) Exemption". California Department of Forestry and Fire Protection and State Board of Forestry and Fire Protection. Sacramento, CA. 46 p. plus Appendices. https://bof.fire.ca.gov/media/dvlputmk/full-10-e-exemption-and-emergency-monitoring-report_ada.pdf

Olsen, W., Coe, D. (2022). Forest Fire Prevention, or Fire Resiliency? Monitoring Report on the 1038 Forest Fire Prevention Exemption. Sacramento, CA. 127 p. plus Appendices. (PDF) Forest Fire Prevention, or Forest Resiliency? Monitoring Report on the §1038 Forest Fire Prevention Exemption (researchgate.net)