

Eastside Modeling Evaluation Project (EMEP)

Answers to Six Questions from the CMER/Policy Interaction Framework Document

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Presented by Scientific Advisory Group – Eastside (SAGE)

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Type of Product in Review:

Prospective Answers: Charter Scoping Document Study Design

Retrospective: Completed Pilot/Study Phase Completed Final Study Report

Brief Description: EMEP modeled how current riparian stands in eastern Washington respond to the eastside riparian prescriptions over time. EMEP evaluates riparian stand conditions using surveys from Phase 1 of the Eastern Washington Riparian Assessment Project (EWRAP).

1. Does the study inform a rule, numeric target, Performance Target, or Resource Objective?

Yes, this study informs the Forest Practices Eastern Washington RMZ harvest rules on Type F streams by modeling existing data to evaluate several questions related to risk of insect and disease, fire, stand attributes by zone, and whether stands that don't meet the requirements for harvest will do so in the next 50 years.

2. Does the study inform the Forest Practices Rules, the Forest Practices Board Manual guidelines, or Schedules L-1 or L-2?

Yes, this study informs the Forest Practices Rules for timber harvest in inner and outer zones on Type F streams in eastern Washington.

3. Was the study carried out pursuant to CMER scientific protocols?

Yes, the study was developed per the CMER Protocols and Standards Manual and vetted through the CMER process for final approval.

4. a. What does the study tell us?

The Results section addresses information gaps associated with the critical question, "What is the current range of conditions for eastside riparian stands and streams?" Specifically, the following summary points are made regarding stand conditions and trajectory of unmanaged stands represented by the EWRAP Phase 1 data set. It is important to emphasize that ALL results are derived from modeled simulations.

Stand Density

- Stand density and tree size are comparable among riparian management zones with some small but not significant differences within each timber habitat type.
- Among ponderosa pine sites, stand density and tree size is slightly less in the outer zone compared to the inner zone, but not significantly.

- Among mixed conifer sites, stand density and tree size is slightly greater in the outer zone compared to the inner zone, but not significantly.

Insect and Disease

- At both ponderosa pine and mixed conifer sites, core and inner zones have higher susceptibility ratings for insect and disease compared to the outer zones.
- Among ponderosa pine sites, core and inner zones are prone to be susceptible to western and mountain pine beetles (T1WPB, T2WMPB, T1MPB), spruce beetle (SB), Armillaria root disease (AROS), laminated root rot (PHWE), S-group annosum root disease (HEANS), and Schweinitzii root and butt rot (SRBR).
- Among mixed conifer sites, core and inner zones are prone to be susceptible to western spruce budworm (WSB), Armillaria root disease (AROS), and laminated root rot (PHWE).

Wildfire

- There is no significant difference in wildfire risk among habitat types or among regulatory riparian management zones. Overall, total flame lengths can range from 1 to 114 feet, with a median of about 12 feet.

Stand Development without Management

- Without management, stands identified in EWRAP continue to increase in stand density and tree size, on average, over the 50-year simulation period.
- Among ponderosa pine sites, periodic annual increment averages about 1.6 square feet per acre per year (or about 1.3% of current basal area).
- Among mixed conifer sites, periodic annual increment averages about 1.9 square feet per acre per year (or about 1.8% of current basal area).
- Similar overall growth rates were observed for other stand density metrics.
- Density dependent and random mortality is relatively low (<1% per year)
- Without management, mortality is significantly greater among ponderosa pine sites compared to mixed conifer sites.
- Without management, mortality is significantly greater in the inner zone compared to the core and outer riparian management zones.
- As stands develop without management, there are predicted increases in moderate and high susceptibility to insect and disease.
- Among ponderosa pine sites, the greatest increases in susceptibility are predicted for western pine beetle susceptibility, western spruce budworm, and Schweinitzii root and butt rot.
- Among mixed conifer sites, the greatest increases in susceptibility are predicted for western pine beetle, Douglas-fir beetle, mountain pine beetle, western spruce budworm, Armillaria root disease, and laminated root rot.
- As stands develop without management or natural disturbances such as wind storms or low intensity fires, there are increases in median flame length.

The Discussion section addresses information gaps associated with the critical questions, “What is the current range of conditions for eastside riparian stands and streams?” and “Will application of the prescriptions result in stands that achieve eastside FP HCP objectives (forest health, riparian

function, and historical disturbance regimes)?” Specifically, the following summary points are made related to response of stands in the EWRAP Phase 1 data set to riparian treatments under the current rules:

- Among sites eligible for harvest in the inner zone, only slight increases in growth occur under managed conditions. There are no significant differences between managed and unmanaged growth rates at these sites.
- Among sites eligible for harvest in the outer zone, there were significant increases in growth rates under managed conditions, with both timber habitat types.
- Among eligible sites, there are predicted decreases in moderate and high susceptibility to insect and disease with even low levels of management.
- Among ponderosa pine sites, treatment effects appear to be generally greater in reducing susceptibility to insects (western spruce budworm, western pine beetle, and mountain pine beetle) compared to diseases, in both inner and outer zones.
- Among mixed conifer sites, similar reductions in moderate and high susceptibility to insect and disease are predicted, but the magnitude of the reduction is not as dramatic as among ponderosa pine sites.
- With management, reductions in flame length are greatest in the outer management zone where there would be the greatest reduction in tree density.
- Predicted flame lengths that would result under management remain tall and would likely not limit wildfire behavior to surface fires.

This study also answers a question not included in the CMER Work Plan, “To what extent do the current riparian stands meet the size and basal area thresholds for timber harvest across regulatory habitat types (elevation bands)?” This question is answered in the Results section.

- We find that shade requirements play a greater role than stocking requirements in determining eligibility for harvest within inner zones.
- Nearly 70 percent of sites are within the bull trout overlay. Practically, this limits treatment opportunities to harvest in the outer 25 feet only along large streams where stocking requirements are met.
- Of those site not in the bull trout overlay, only about 20 sites meet shade under WAC 222-30-040 and of those, 60 to 90 percent meet stocking requirements over time.
- Restrictions on harvest in outer zones are not as great and nearly all sites are eligible.

Given the foregoing, the authors believe the most notable implication of these findings is that they indicate that there are limited benefits to forest health and reduction of wildfire risk in inner zones under the WACs. Greatest among the factors limiting benefits are rules that limit the opportunity to treat inner zones. Despite having demonstrable forest health concerns, the majority of inner zones cannot be treated, leading to further increases in susceptibility to insects and disease and wildfire risk. Where treatment is possible in inner zones under the rules, the

findings in this study also show that the level of treatment has a limited but insignificant benefit to growth and limited benefit to insect and disease susceptibility among mixed conifer sites.

4b. What does the study not tell us?

Study limitations and potential effects of study methods on results are presented in the Discussion section.

- Key concerns include the effects of field data collection methods and modeling assumptions.
- Specifically, low stocking conditions were observed for the majority of sites, and therefore, these results may not represent trends and patterns for fully stocked stands.
- Additionally, shade was estimated using a simple model to determine shade eligibility, where a more complex model informed by field measurements would likely be more realistic.
- Finally, there was not sufficient data collected to summarize results by ecological zones or plant association groups, and so elevation bands were used to group stands.
- Overall, the authors acknowledged and discussed potential effects of these concerns on the results, but believe the findings based on these methods are representative for comparison purposes.

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

The EMEP is Phase 2 of EWRAP, which was completed in 2016. Results from the EWRAP showed that there were issues with the regulatory elevation bands (timber habitat types) resulting in the development of the ETHEP scoping document that is currently in CMER for review. ETHEP is also designed to have multiple phases of modeling and field research.

CMER is currently developing a study (Riparian Characteristics and Shade Response Experimental Research Study; RCS) to evaluate how stream shade responds to a range of riparian harvest treatments of both east and westside stands.

6. 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?

Currently there are no references identified on where the current rules managing RMZs on Type F streams were developed from. Nevertheless, rules were developed for low and high density stands by elevation zone, with the goal of providing the necessary functions to meet the intent of the HCP.

As stated in the Forest and Fish Report, one of the goals is to “restore and maintain riparian

habitat” through the implementation of these rules. This assumes that stocking levels are adequate to allow harvest and the landowner chooses to harvesting in the RMZ.

Modeling provided information on how the current stand condition would respond to different rule implementation methods, with or without harvest, over 50 years. This resulted in a significant gain in understanding on how these RMZ's may develop over time. In addition, outputs on how these stands may effect forest health and resiliency to fire provided a much better understanding of how the Rules might effect these processes.