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MEMORANDUM

March 30, 2018

TO: TFW Policy Committee

FROM: Hans Berge, Adaptive Management Program Administrator

SUBJECT: CMER products for Policy

This memo describes the information being transmitted to Policy prior to the April 2019 meeting. The specific products include information on projects that are ready for implementation, a findings report for the Type N Hard Rock Study (phase I), and the Fire Salvage Literature Synthesis and accompanying findings report approved by CMER.

Westside Type F Riparian Prescription Monitoring

I have attached to this memo the CMER approved Westside Type F Riparian Prescription Monitoring Project Study Design, "prospective" Findings Report, and Implementation Recommendations/Updated Budget documents for the Phase 1 Exploratory Study. These documents are being transmitted to Policy as required by Section 4.1 of the TFW/CMER Lean process. Per the Lean process, the TWIG submits to Policy the documents identified above for your information. The TWIG is also directed to ask Policy to prioritize the study in the budget and allocate sufficient funding and staff resources for implementation.

Due to the large number of different prescription variants and uncertainty about how frequently the prescription variants were used: two preliminary information gathering steps were identified to be completed prior to development of the intensive BACI study 1) an analysis of approved forest practice applications and GIS data (the FPA/GIS analysis) to determine the implementation frequency of different prescription variants and the size and spatial distribution of riparian harvest units on the landscape, and 2) an exploratory field study to examine post-harvest stand characteristics and riparian functions associated with various prescription variants. The results of the FPA/GIS analysis was used to inform development of the second phase of the project an exploratory field study.

The exploratory study is intended reduce uncertainties associated with the relative sensitivity of post-harvest riparian stand conditions and riparian functions to potential disturbances associated with the prescription variants and to provide an estimate of effect size for some metrics. Information on the magnitude of differences between prescription variants will be used to inform and guide the design of the intensive BACI study. The exploratory field study will assess riparian stand conditions and selected riparian functions across a wide range of prescription variants and site conditions providing a coarse-level assessment of current riparian conditions that focuses on addressing scientific uncertainty surrounding their sensitivity to current forest practices expressed as prescription variants. This is not a designed experiment but an exercise in collecting pilot data for riparian prescriptions that are already distributed across the landscape. It is estimated that the exploratory study will be completed in approximately three years. At the conclusion, CMER will have information for most of the westside Type F prescription variants including:

- the level of riparian functions associated with the prescriptions, including data on post-harvest large wood recruitment, shade, and sediment delivery,
- riparian stand conditions associated with the prescriptions, including stand mortality, density, basal area, and the proportion of sites currently on trajectory to meet DFC target of 325 ft2/acre of basal area at 140 years,
- the frequency, magnitude and distribution of windthrow and its effects on stand structure, buffer tree mortality rates and riparian functions,
- the relative influence of differences in site conditions and geographic location on the above.

Eastside Type N Riparian Effectiveness Project

I have attached to this memo the CMER approved Eastside Type N Riparian Effectiveness (ENREP) Project Study Design, "prospective" Findings Report, and Implementation Recommendations/Updated Budget documents. These documents are being transmitted to Policy as required by Section 4.1 of the TFW/CMER Lean process. Per the Lean process, the TWIG submits to Policy the documents identified above for your information. The TWIG is also directed to ask Policy to prioritize the study in the budget and allocate sufficient funding and staff resources for implementation.

The purpose of this project is to determine the extent to which the prescriptions found in the eastside Type N Riparian Prescriptions Rule Group are effectively achieving performance targets, particularly as they apply to sediment and stream temperature and their effects on aquatic life. As an effectiveness monitoring project, it is also expected to inform whether the current rule is effective in meeting these targets. The project will inform Policy of the quantitative changes in FPHCP covered resources, water quality and aquatic life coincident with forest harvest activities

in eastern Washington, and to determine if and how observed changes are related to activities associated with forest management. Three critical questions underlay the research approach proposed by the TWIG.

1. What is the magnitude of change in water temperature, canopy closure, and stream cover of Type Np channels in the first two years after harvest?

2. What is the magnitude of change in stream flow and suspended sediment export from the Type Np basin in the first two years after harvest?

3. What is the relationship between observed changes in resource condition and forest management activity?

This study will use a hierarchical design that incorporates a blocked Multiple Before-After/Control-Impact (MBACI) design with reaches nested within basins to quantify the magnitude of change that occurs as a result of harvest activity. The MBACI design, which is replicated in space and time, controls for natural variability throughout the pre- and post-treatment periods and allows researchers to estimate the likelihood that observed effects are related to anthropogenic activity.

The study is designed with two-years of pre-treatment monitoring and at least two-years of post-treatment monitoring. Two-years is not enough time to capture the full range of effects, especially those that are likely to be episodic. Although the degree of inference will be limited by the relatively short pre and post-treatment phases, this has been shown to be adequate for quantifying the initial changes associated with harvest (e.g., McIntyre et al. 2017). Longer-term monitoring will be required to determine the overall trajectory of the response and to capture a broader range of climate conditions and greater potential for episodic changes with less frequent recurrence intervals.

Road Prescription-Scale Effectiveness Project

I have attached to this memo the CMER approved Road Prescription-Scale Effectiveness Monitoring Project Study Design, "prospective" Findings Report, and Implementation Recommendations/Updated Budget documents. These documents are being transmitted to Policy as required by Section 4.1 of the TFW/CMER Lean process. Per the Lean process, the TWIG submits to Policy the documents identified above for your information. The TWIG is also directed to ask Policy to prioritize the study in the budget and allocate sufficient funding and staff resources for implementation.

The project is designed to improve our understanding and ultimately our capacity to efficiently handle sediment from high-traffic, near-stream (HTNS) road segments. The approach will

collect extensive field data while simultaneously developing a theoretically based model, which can be subsequently refined based on the empirical data. The proposed experimental design can determine how individual and combinations of BMP affect sediment supply, sediment transport, and road runoff across a range of environmental conditions. The project will provide landowners the information to cost effectively address problem road segments. The statistical analysis of the modeled and experimental data will produce empirical formulations that can be implemented in existing road erosion tools used for decision making under a range of environmental and BMP combinations. This project will provide landowners, managers, and regulatory agencies with better information to more cost effectively address delivering road segments.

Type N Hard Rock Findings Report

Chapters contained within the phase 1 Type N Hard Rock Study have been reviewed by Policy. In addition, in October 2017 individual presentations on each chapter were given to Policy. The attached findings report pertains to the overall study and integrates the findings from individual chapters. After reviewing this document it will be important to consider whether or not additional findings reports from other chapters will be required.

Fire Salvage Literature Review

As you are aware, SAGE has been interested in topics around the effects of forest management on riparian resources for some time. The first product directly targeted on this topic was a literature review related to salvage logging. The results of this literature review highlight how little information is available on this topic, and point to several different areas where well-constructed studies could provide valuable insight into this topic.