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To: Curt Veldhuisen and Terra Rentz, TFW Policy Co-Chairs

Form: Mark Hicks, Adaptive Management Program Administrator

Subject: Bull Trout Overlay Add On Report (BTO-Add On) Findings Transmittal

At their December 17, 2019 meeting, the Cooperative Monitoring Evaluation and Research Committee (CMER) formally approved answers to the first 6 questions of the Framework for Successful Policy/CMER Interaction for the report titled: ***Comparison of the Standard and All Available Shade Rules for the Fish-Bearing Streams in the Mixed Conifer Timber Habitat Type Under Washington's Forest Practices Habitat Conservation Plan.*** The purpose of this memo is to transmit those findings to TFW Policy (Policy). Upon receipt, Policy has 180-days to make an action or no-action recommendation to the Forest Practices Board.

The BTO Add-On study used 17 sites from the Eastside Riparian Shade/Temperature study (Cupp and Lofgren 2014). Potential sites were non-randomly selected with the majority of the sites located in northeastern Washington State. Study sites were adjacent to Type F (fish-bearing) streams with continuous flowing water less than 15 feet in bankfull width. Post-harvest surveys were completed at each site one-two years and five years post-harvest.

The report compares response of riparian stands, tree fall and wood input in riparian management zone (RMZ) buffers following harvest under two variations of the eastern Washington riparian prescriptions for fish-bearing streams in the Mixed Conifer Timber Habitat Type (2500-5000 feet elevation). Both prescriptions have an unharvested core zone within 30 feet of the stream, but differ in leave tree requirements within the inner zone, 30–75 feet from the stream, due to differences in shade requirements. The All Available Shade (AAS) rule requires retention of all inner zone trees that provide shade, while standard rule (SR) prescriptions have a lower shade requirement that typically allows greater inner zone harvest. The study characterized changes in stand structure, tree mortality, ingrowth, and wood recruitment from tree fall over a five-year post-harvest period and compares responses to the AAS and SR prescriptions with unharvested reference (REF) sites.

The SR treatment resulted in the greatest change in stand structure, tree mortality, and wood recruitment from fallen trees compared to the unharvested REF sites. The responses to the AAS treatment were intermediate, but more similar to the REF than to the SR treatment. The SR responses, including change in stand structure, tree mortality, and wood recruitment from tree fall were significantly different from both the AAS and REF treatments; but there were no significant differences in the AAS and REF responses.

Thinning within the inner zone under the SR and AAS treatments reduced live density, basal area and relative density compared to unharvested reference sites. Inner zone thinning guided by the preferred species list (WAC 222-26-010) appeared to increase the proportion of preferred species and reduce the proportion of shade tolerant species relative to the core zones; however the effects were limited and SR and AAS RMZs continued to be dominated by shade tolerant species. Post-harvest tree mortality was significantly higher in SR buffers compared to AAS and REF sites. Damage from wind was the most frequent cause of mortality at SR and AAS sites in contrast to the reference sites.

The pattern of wood recruitment from fallen trees followed the pattern of tree mortality. Wood input from tree fall in SR RMZs was significantly greater than in AAS or REF RMZs. The cumulative density of fallen trees that provided wood input in SR RMZs was nearly double that in AAS RMZs, primarily due to extensive wind throw at two of eight SR sites. While the SR and AAS prescriptions increased wood input during the first five years after harvest, inner zone thinning and post-harvest mortality reduced the standing stock of trees available for future wood recruitment. The density of standing trees in SR inner zones was only half that of the unharvest REF sites, while AAS stocking was more similar to REF stocking.

The results of this study, combined with the results from the associated Eastside Bull Trout Overlay Temperature and Solar Radiation/Effective Shade studies, enhance our scientific understanding of the response in stand structure, buffer tree mortality, wood recruitment, shade and stream temperature response to the tested Eastern Washington Type F prescriptions. This information reduces scientific uncertainty about attaining resource objectives for Heat/water temperature and LWD/Organic inputs, and have increased our understanding of buffer tree mortality and post-harvest stand trajectory following harvest. This study is limited, however, by the relatively small number of sites (17), the limited geographic distribution of the sites, and the five-year post-harvest timeframe.

The authors recommend: 1) additional long-term monitoring of a larger sample of sites to address uncertainty about the effect of the prescriptions on episodic mortality due to wind throw, insects, fire, and disease, and 2) intensive in-channel research to document the effects of the prescriptions on water quality, wood loading, and fish habitat.

This study, similar to the Westside Type N BCIF study does not provide direct evidence on the level of water quality or other aquatic resource protection. Policy should consider these findings in association with other studies that directly measure aquatic resource effects, while additionally beginning a conversation on potential long-term chronic implications of RMZ management.