

## Memorandum

To: Timber, Fish & Wildlife Policy Committee

From: The Forested Wetlands Effectiveness Program TWIG

Date: September 21, 2015

Re: Policy approval of problem statement, study objectives, and critical questions for the Forested Wetlands Effectiveness Project

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The Washington Forest Practices Board (WFPB) directed CMER to apply the recommendations of the LEAN consultant in a set of pilot projects. Per the new pilot process, the Wetland Technical Writing and Implementation Group (TWIG) is requesting Policy approval of the initial problem statement, objectives, and critical research questions.

### **Background**

The Washington State Legislature and the Washington Forest Practices Board (WFPB) have adopted rules designed to maintain and restore salmonid populations and meet the requirements of the Federal Clean Water Act, and it set up a formal science-based Adaptive Management Program (AMP) to provide science-based recommendations and technical information to assist the WFPB in determining when it is necessary or advisable to adjust the rules and guidance to achieve the resource objectives (WAC 222-12-045). The resource objectives are intended to ensure that forest practices, either individually or cumulatively, will not significantly impair the capacity of aquatic habitat to: a) support harvestable levels of salmonids; b) support the long-term viability of other covered species; c) meet or exceed water quality standards, protection of beneficial uses, narrative and numeric criteria, and anti-degradation (WAC 222-12-045(2)(a)).

The WFPB has empowered the Cooperative Monitoring Evaluation and Research committee (CMER) and the TFW policy committee (Policy) to participate in the AMP (WAC 222-12-045(2)(b)). CMER has been tasked with completing a programmatic series of work tasks in support of the AMP; these tasks are laid out in an annual work plan that is approved by Policy. The Forested Wetlands Effectiveness Program has been given a high research priority because of the many gaps in the scientific understanding of wetland ecosystem functions, as well as the limited protection for forested wetlands under current Forest Practices Rules.

This document provides an opportunity for Policy to review and approve the problem statement, objectives and critical questions for the Forested Wetlands Effectiveness Project. The purpose is to ensure the study is informed by the research needs and priorities of Policy. Following approval of this document, the TWIG will evaluate and use the best available science to prepare a document with study design alternatives for CMER and Policy approval. CMER will review and

approve the document if it defensibly portrays and uses the best available science in developing study design alternatives. Policy will rely on the document to select alternative(s) that will be used as the basis for developing a complete study design.

## **Introduction to the Forested Wetlands Effectiveness Study**

Wetlands are critical habitats at the interface of aquatic and terrestrial ecosystems that contain unique vegetation and soils, and perform important functions driven by the prolonged presence of water. Many wetlands influence hydrologic regimes, water temperature, nutrient cycles, and physical habitat characteristics in watersheds. Forested wetlands (i.e., wetlands with mature timber, or potential timber stands with a crown closure of 30 percent or more; WAC 222-16-035 (2) ) occur frequently across Washington. In some regions, two or more forested wetlands may exist per headwater stream channel (Janisch et al. 2011) and, in many regions, frequently occur in depressions and flat areas. Despite their frequent and extensive occurrence, and potential influence on downstream ecosystems, limited information exists describing forested wetland ecology. Moreover, as illustrated in the Wetlands and Forest Practices Literature Synthesis (Adamus 2014), impacts of forest practices within and upslope of forested wetlands in the Pacific Northwest have not been examined. The Forested Wetlands Effectiveness Study seeks to examine the role forested wetlands play in hydrologic budgets, temperature regimes, nutrient cycles, and habitat functions of watersheds managed under the Forest Practices Habitat Conservation Plan (FPHCP) in Washington State. It also seeks to determine the impacts of forest practices (harvest, road construction and maintenance, and forest chemical application) on the functions of forested wetlands and on connected watershed functions, potentially including the regulation of surface and subsurface hydrologic exchange, temperature, and sediment, carbon, and nutrient dynamics.

## **Problem Statement**

Forested wetlands receive the least amount of protection among wetland types defined in the current Forest Practices Rules. Low-impact timber harvest is permitted in these wetlands where there is, or would be if trees were mature, a live-crown canopy closure of at least 30% of merchantable species. Effects of this harvest and other forest practices on forested wetland structure and function remain poorly understood.

### **Primary Issues:**

1. Forested wetlands are not well understood—it is not adequately known what functions they support, what services they provide, or how they are altered by timber harvest and other forest practices.
2. It is stated in the Washington forest practices rules that functional levels of forested wetlands and downstream aquatic resources should be restored by half a timber rotation;

however, this objective has not been tested. Moreover, “functions”, under forest practices rules, have not been specified and baseline (pre-harvest or application, or “ambient”) levels are not known.

3. It is unknown whether there are forested wetland types or locations that are particularly sensitive to forest practices (i.e., that experience greater shifts in functional levels post-harvest or other treatment and/or have longer residual changes in functions post-treatment compared to other types or locations).
4. The population of forest practices-defined forested wetlands has not been adequately characterized.

Developing the scope, objectives, and critical questions:

The Wetlands Rule Group of the CMER Workplan has been under revision since November 2014. The goal of the update is to adapt the programs, projects, and critical questions to the Policy-approved Wetland Research Strategy (Adamus 2014), which puts a scientific and logical framework to the programs, and provides a prioritization strategy for research. During these edits, WetSAG defined the scope of the Forested Wetlands Effectiveness Program. The revised-workplan scope included the effects of timber harvest, occurring in and upslope of forested wetlands, on the functions of the forested wetlands and downstream connected waters. However, the TWIG’s current critical questions are broader in scope, including *forest practices* rather than only timber harvest. This widening of scope was brought about by early TWIG discussions that highlighted the complex interrelatedness of forest practices, including harvest and new road construction related to harvest , as well as silvicultural chemicals and aquatic function. The TWIG feels that narrowing the scope at this point, to only timber harvest, would ignore many major covariates and produce results that are not transferable to adaptive management. Previous research studies conducted by TWIG members on the effects of forest practices on forest hydrology included multiple forest practices in paired-watershed studies due to the unfeasibility of separating practices in a study (e.g., clearing for harvest and roads) (Story et al. 2003, Leach et al. 2011).

Currently, so little is known about forested wetlands that the scope of the study cannot be narrowed to a single forest practice, region, or type of forested wetland. More reconnaissance information is needed to further refine the scope and critical questions; however, the TWIG feels the current critical questions listed below are broad enough to encompass the initial avenues of scoping and information gathering.

Further information needed:

- a. What is the distribution of forested wetlands? How large is the average harvested forested wetland? How frequently do they occur on the landscape? What is the probability in each region that any given area or watershed basin will contain a forested wetland?
- b. In which region are forested wetlands subject to the frequent and/or intense harvest?
- c. What type (e.g., landscape position, hydrologic source, and vegetation community) of forested wetlands are harvested most often?

## **Study Objectives**

The TWIG proposes the following primary research objectives for this project:

1. To examine how well current forest practices rules meet the performance target of no-net-loss of wetland functions by half of a timber rotation cycle
2. To develop study design(s) that, when implemented, will yield meaningful data on the changes in wetland functions and associated aquatic resources due to implementation of forest practices rules

The TWIG's next task will be to conduct a Best Available Science (BAS) synthesis, and to subsequently use the information to develop study design alternatives for a Forested Wetlands Effectiveness Study that will address both these objectives and the following Critical Questions. The Best Available Science document will incorporate knowledge gained from the 2014 literature synthesis conducted by WetSAG on the effects of roads and tree removal on wetlands (Adamus 2014); however the BAS document will also incorporate sources from other regions and will be tailored to the Critical Questions below.

## **Critical Questions**

Below are high-level critical questions; detailed hypotheses will be developed based on the BAS synthesis and will be used to guide the study design.

1. How do the magnitude and duration of forest practices in forested wetlands affect water regimes, water quality, plant and animal habitats, and aquatic resources in those wetlands and linked (via surface or subsurface flow) downstream waters?

2. How well do current forest practices rules in forested wetlands meet the Forest and Fish aquatic resource objectives and performance targets, and the goal of no-net-loss of functions of those wetlands by half of a timber rotation cycle?

## References

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