

Findings Report for Literature Synthesis: Effects of Forest Roads and Tree Removal In or Near Wetlands of the Pacific Northwest

November 2014

**1. Does the study inform a rule, numeric target, performance target, or resource objective**

Yes

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

Yes. The study highlights the lack of research available to answer key questions from the hydrologic section of schedule L-1. "No net loss of hydrologic functions." Appendix F requires no net loss of functions as well.

**3. Was the study carried out pursuant to CMER scientific protocols (i.e., study design, peer review)?**

Yes. The study plan went through WetSAG, CMER, and ISPR review. The study was conducted according to the CMER and ISPR-approved study design. WetSAG, CMER, and ISPR approved the revised Synthesis in September 2014.

**4A. What does the study tell us?**

The literature review found almost no information on research in forested wetlands or timber harvest of forested wetlands in the northwest. Consequently, the findings below are an interpretation of research concerning the effects of logging on streams and riparian areas as they may apply to wetlands.

- The most certain effect of forestry operations on wetlands is direct filling of small wetlands during the construction of logging roads.
- It is reasonably certain that timber harvest in many PNW locations will result in a rise in local water tables, greater water yield, and warming of surface runoff.
- It is relatively certain that removing a significant part of the forest canopy in and around forested wetlands will:
  - Increase light penetration and expand growth of algae in understory surface water, and consequently increase temporarily the abundance of aquatic invertebrates
  - Heighten the risk of windthrow in trees
  - Encourage invasion by non-native plants
  - Eliminate some shade-obligate plants and microclimate-sensitive mosses and lichens
  - Facilitate colonization by wildlife species not present before harvest
  - Increase soil erosion and export of suspended sediment from the logged site when soil has been disturbed

#### **4B. What does the study not tell us?**

- The effects of timber harvest on other functions have moderate to low certainty, including:
  - The degree to which disturbances from logging operations mimic natural disturbances to wetlands in the biogeographic region, and either add to or offset these effects
  - Effects of both wetlands and forest practices on the timing and seasonal persistence of surface water in downslope areas
  - Effects of higher post-logging water tables on water detention times in wetlands, as it influences the pollutant processing capabilities of the wetlands, the reproductive successes of pond-breeding amphibians, and fish access and growth
  - Extent of small wetlands that experience faster sedimentation as a result of nearby logging operations and the ecological consequences of that sedimentation
  - Direct and indirect consequences for salmon and other aquatic life of changes in the amount, form, and timing of nutrients, large wood, and organic matter received and exported by wetlands

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

The literature synthesis provided the technical basis for developing a wetlands research strategy that will replace the existing strategy in the work plan. The refinement in our knowledge of the data gaps in regard to forested and other wetlands helped to generate a list of potential hypotheses (appendix A of the literature synthesis) that can be used in future studies. A Wetland Research and Monitoring Strategy addresses these data gaps and proposes a long-term strategy of projects to begin to answer the questions.

#### **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?**

The studies served to highlight how little work has been done regarding timber production and Pacific Northwest wetlands, and that hypotheses based primarily on riparian study results will need to be explored in order to see if the results are applicable to wetlands.