

# Survey of Forest Practices Applications – Wetlands and Forest Practices Interactions

## Development Report

Wetlands Scientific Advisory Group



WASHINGTON STATE DEPARTMENT OF  
**Natural Resources**  
Peter Goldmark - Commissioner of Public Lands

July 2011



Cooperative Monitoring  
Evaluation & Research

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**Washington State Forest Practices Adaptive Management Program  
Cooperative Monitoring, Evaluation, and Research Committee (CMER)  
Development Report**

**Survey of Forest Practices Applications –  
Wetlands and Forest Practices Interactions**

**Prepared by:**

**Wetlands Scientific Advisory Group**

**Prepared for the**

**The Cooperative Monitoring, Evaluation, and Research (CMER) Committee  
Washington State Forest Practices Board  
Adaptive Management Program  
Washington State Department of Natural Resources  
Olympia, Washington**

**July 2011**

## **Washington State Forest Practices Adaptive Management Program**

The Washington State Forest Practices Board (FPB) has established an Adaptive Management Program (AMP) by rule in accordance with the Forests & Fish Report (FFR) and subsequent legislation. The purpose of this program is to:

*Provide science-based recommendations and technical information to assist the FPB in determining if and when it is necessary or advisable to adjust rules and guidance for aquatic resources to achieve resource goals and objectives. The board may also use this program to adjust other rules and guidance. (Forest Practices Rules, WAC 222-12-045(1)).*

To provide the science needed to support adaptive management, the FPB established the Cooperative Monitoring, Evaluation and Research (CMER) committee as a participant in the program. The FPB empowered CMER to conduct research, effectiveness monitoring, and validation monitoring in accordance with WAC 222-12-045 and Board Manual Section 22.

### **Report Type and Disclaimer**

This project development report was prepared for the Cooperative Monitoring, Evaluation and Research Committee (CMER), and was intended to support design and implementation of Forest and Fish Adaptive Management research and monitoring studies. The project is part of the Wetlands Mitigation Program and the Forested Wetlands Effectiveness Program, and was conducted under the oversight of the Wetland Scientific Advisory Group.

This document was reviewed by CMER but was not assessed through the Adaptive Management Program's independent scientific peer review process. CMER has approved this document for distribution as an official CMER document. As a CMER document, CMER is in consensus on the scientific merit of the document. However, any conclusions, interpretations, or recommendations contained within this document are those of the authors and may not reflect the views of all CMER members.

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### **Proprietary Statement**

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### **Full Reference**

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## Introduction

There is uncertainty about the extent to which constructing and maintaining forest roads in, adjacent and near wetlands and harvest of forested wetlands is occurring in Washington State, and whether these activities create a risk to wetland functions. The Survey of Forest Practices Applications – Wetlands and Forest Practices Interactions Development Report will help address this uncertainty by answering two primary questions, along with two related sub-questions:

### *Forest roads and wetland interactions*

Question 1: How often do forest practice applications (FPAs) list the presence of at least one wetland (forested, Type A, Type B) while also proposing some kind of road work (i.e. construction, maintenance, abandonment, stream crossing, culvert replacement)?

Question 1a: For those FPAs that list the presence of at least one wetland (forested, Type A, Type B) and some kind of road work, how often do these FPAs indicate that road work will occur within 200' of a wetland (forested, Type A, Type B)?

### *Harvest of forested wetlands*

Question 2: How often do FPAs list the presence of at least one forested wetland?

Question 2a: For those FPAs that list the presence of at least one forested wetland, how often do these FPAs indicate that harvest activities will occur in a forested wetland?

This write-up describes how the FPAs were filtered, surveyed and reviewed to answer each set of questions. Findings and discussion sections are followed by a brief section on how the information will be used to meet the research objectives of Washington State's forest practices adaptive management program.

## Forest roads and wetland interactions

Question 1: How often do forest practice applications (FPAs) list the presence of at least one wetland (forested, Type A, Type B) while also proposing some kind of road work (i.e. construction, maintenance, abandonment, stream crossing, culvert replacement)?

Question 1a: For those FPAs that list the presence of at least one wetland (forested, Type A, Type B) and some kind of road work, how often do these FPAs indicate that road work will occur within 200' of a wetland?

### Methods: Question 1 and Question 1a

The survey of FPAs to estimate the incidence of road work occurring near wetlands occurred in two steps. The first step included downloading from the DNR web site Forest Practice Application Review System (FPARS) summary tabular data<sup>1</sup> of Forest Practices Application/Notification (FPA/N) activities from approved FPAs. These summary FPARS tables included approved FPA permits from three western Washington DNR regions (South Puget Sound, Pacific Cascade, and Olympic) for the time period of January 2003 to August 2010. These regions were initially surveyed in August 2010 to prepare

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<sup>1</sup> Tabular data include descriptions of the forest practice units (e.g. proposed harvest unit boundaries, road network, RMZ configurations, typed wetlands, etc.) as well as proposed activities such as tree harvest, chemical applications, road construction and maintenance, etc.

a hand-out for a September 2010 CMER wetlands field trip. FPAs which indicated that at least one wetland (Type A, Type B, or Forested) was present in the forest practice unit along with some kind of proposed road work (construction, maintenance, abandonment, stream crossing, culvert replacement) were counted. Based on feedback from the field trip the FPA office survey was expanded to all DNR regions to include the Northwest, Northeast and Southeast Regions. The time period of the FPARS survey for these three additional DNR regions ranged from January 2003 and October 2010. WetSAG used data from all 6 regions to answer question 1.

The second step of the survey included randomly selecting a subsample of the FPAs from step one which listed both road work and wetlands. The randomly selected FPAs were downloaded and individually reviewed to estimate the occurrence of road work within 200' of a wetland. The review included examining text and maps. The goal was to subsample at least 10% of the FPAs generated in step one from each region but time constraints prevented meeting that target. Overall 133 FPAs were sub-sampled, 8.7% of the FPA pool generated in step 1. The step 2 review was completed to address question 1a. FPAs submitted by all state and private forestland owners were included in the review. FPAs which indicated the property would be converted to non-forestry use (i.e. a Class IV conversion) were excluded from the step 2 review and subsequent analyses.

Findings: Question 1 and Question 1a

A total of 24,445 FPAs were tabulated from the six DNR Regions (Table 1). FPARS tabular data indicated that 1,536 of those FPAs (6.3%) listed both wetlands and road work.

The Northwest Region produced the greatest number of FPAs listing both wetlands and road work (364) though the region with the greatest percentage of FPAs that included both road work and wetlands was the South Puget Sound (10.3%). The Southeast Region produced the fewest total number of FPAs (29) and the lowest occurrence of FPAs with both wetlands and road work (2.3%) (Table 1).

**Table 1. Summary results from office level survey and review of FPAs from Jan. 2003 – Aug. 2010 (South Puget Sound, Pacific Cascade, and Olympic regions) and Jan. 2003 – Oct. 2010 (Southeast, Northwest, and Northeast regions). The survey and review quantified the occurrence of FPAs listing both road construction and at least one wetland (forested, Type A, Type B) and the incident of road work occurring within 200' of a wetland (forested, Type A, Type B).**

Survey of FPARS tabular data (Question 1)				Individual review of sub sampled FPAs which listed road work and wetland presence (Question 1a)		
DNR Region	# of FPAs surveyed	# of FPAs w/ roadwork & wetlands <sup>2</sup>	% FPAs w/ roadwork & wetlands	# of FPAs sub-sampled	# of sub-sampled FPAs w/ roads within 200' of wetlands	% sub-sampled FPAs w/ roads within 200' of wetlands
Olympic	2,382	235	9.9	19	14	73.7
S. Puget Sound	3,324	342	10.3	17	10	58.8
Northwest	3,594	364	10.1	20	13	65
Pacific Cascade	8,643	355	4.1	41	20	48.8
Northeast	5,231	211	4	21	8	38.1
Southeast	1,271	29	2.3	15	8	53.3
<b>All FPAs pooled</b>	<b>24,445</b>	<b>1,536</b>	<b>6.3</b>	<b>133</b>	<b>73</b>	<b>54.9</b>

<sup>2</sup> An unknown percent of these FPAs are Class IV conversions (to non-forestry use). Class IV conversion FPAs were filtered out in the sub-sampling to estimate the occurrence of road work within 200' of a wetland.

When drawing from the pool of FPAs which included road work and at least one wetland (forested, Type A, Type B), 38.1% to 73.7% of the FPAs indicated that the at least some of the road work would occur within 200' of a wetland (Table 1). Overall, 54.9% of the 133 FPAs downloaded and reviewed indicated that the proposed road work would occur within 200' of a wetland (Table 1). The Olympic Region produced the highest percent (73.7%); the Northeast Region produced the lowest (38.1%).

## **Harvest of forested wetlands**

Question 2: How often do FPAs list the presence of at least one forested wetland?

Question 2a: For those FPAs that list the presence of at least one forested wetland, how often do these FPAs indicate that harvest activities will occur in a forested wetland?

### Methods: Question 2 and Question 2a

The forested wetlands survey was also completed in two steps. The first step included downloading from the DNR web site FPARS summary tabular data of all listed Forest Practices Application/Notification (FPA/N) activities from approved FPAs. FPAs which listed the presence of at least one forested wetland in the forest practice unit were counted to answer Question 2. The FPARS survey data included all approved FPAs from all six DNR regions from January 1, 2003 to October 1 2010.

The second step of the survey included randomly selecting a subsample of the FPAs from step one which listed the presence of at least one forested wetland. These FPAs were downloaded and reviewed individually to estimate and record whether logging occurred within a forested wetland. The review included examining text and maps. The goal was to subsample at least 10% of the FPAs which listed the presence of at least one forested wetland from each DNR region but time constraints prevented meeting that target. Overall 134 FPAs were sub sampled, 9.3% of the forested wetland FPA pool generated in step 1. The step 2 review was completed to address Question 2a. FPAs submitted by all state and private forestland owners were included in the review. FPAs which indicated the property would be converted to non-forestry use (i.e. a Class IV conversion) were excluded from the step 2 review and subsequent analyses.

### Findings: Question 2 and Question 2a

A total of 24,882 FPAs were tabulated from the six DNR Regions (Table 2). Depending on the DNR region, 1.8% to 11.4% of FPAs listed the presence of forested wetlands (Table 2). Overall 5.8% of the FPAs listed the presence of a forested wetland. The Northwest Region contained the highest percent of FPAs listing the presence of a forested wetland (11.4%), the Southeast Region contained the lowest percent (1.8%).

**Table 2. Occurrence of FPAs that list forested wetlands and propose harvesting forested wetlands, Jan. 2003 – Oct. 2010.**

Survey of FPARS tabular data (Question 2)				Individual review of sub sampled FPAs which listed road work and wetland presence (Question 2a)		
DNR Region	# of FPAs surveyed	# of FPAs w/ forested wetlands <sup>3</sup>	% FPAs w/ forested wetlands	# of FPAs sub-sampled	# of sub-sampled FPAs w/ harvest of forested wetlands	% sub-sampled FPAs w/ harvested forested wetlands
Olympic	2,455	222	9	21	16	76.2
S. Puget Sound	3,430	294	8.6	27	17	63
Northwest	3,594	409	11.4	38	24	63.2
Pacific Cascade	8,901	391	4.4	27	18	66.7
Northeast	5,231	97	1.9	13	5	38.5
Southeast	1,271	23	1.8	8	4	50
<b>All FPAs pooled</b>	<b>24,882</b>	<b>1,436</b>	<b>5.8</b>	<b>134</b>	<b>84</b>	<b>62.7</b>

When drawing from the pool of FPAs which listed the presence of at least one forested wetlands, 38.5% to 76.2% of the FPAs indicated that trees would be harvested from a forested wetland (Table 2). Overall 62.7% of the FPAs which listed the presence of a forested wetland indicated harvest of a forested wetland. The Northwest region produced the highest number of FPAs listing both the presence of forested wetlands and harvest (24), but Olympic region had the highest percent of sub-sampled FPAs indicating that harvest would occur within a forested wetland (76%). The Southeast Region had the lowest number of FPAs listing both the presence of forested wetlands and harvest (4), but the Northeast had the lowest percent of sub-sampled FPAs indicating that harvest would occur within a forested wetland (39%).

## Discussion

The six DNR regions break into two groups based on the relative occurrence of wetlands listed on FPAs. The first group includes the Olympic, South Puget Sound and the Northwest Regions where at least 9.9% of the FPAs surveyed include both road work and wetlands (Table 1), or where at least 9% of the FPAs list the presence of a forested wetland (Table 2). The percent of sub-sampled FPAs (i.e. FPAs that listed the presence of wetlands and road work) which indicated that road work would occur within 200' of a wetland exceeded 58% in each of the regions of this group. The percent of FPAs which listed the presence of forested wetlands and indicated that forested wetlands would be harvested ranged from 63% to 76% for this group as well.

The second group consists of the Pacific Cascade, Northeast and Southeast Regions. The number of FPAs listing road work and wetland presence is below 5% for the regions of this group, and the number of FPAs listing the presence of a forested wetland is below 4.5%. The percent of sub-sampled FPAs indicating road work would occur within 200' of a wetland are below 54% for all the regions in this group. The percent of sub-sampled FPAs indicating forested wetlands would be harvested ranged from 39% to 67%, in general lower than the percent of harvest of forested wetlands of first group,.

<sup>3</sup> An unknown percent of these FPAs are Class IV conversions (to non-forestry use). Class IV conversion FPAs were filtered out in the sub-sampling to estimate the occurrence of logging activities within a wetland.

A few important caveats are worth noting from this survey of FPAs. Despite the recent addition of 165,000 polygons to DNR's wetland data layer ("fp\_wet"), wetland maps are still considered unreliable when identifying wetlands, particularly small wetlands and forested wetlands. FPAs do not list every forested wetland and FPA instructions guide landowners to not list forested wetlands smaller than 3 acres. This alone is reason to suspect that forested wetlands < 3 acres are underestimated. The quality of maps submitted with the FPA by the applicants also varies widely, making it difficult to interpret poor quality maps as to the location of roads and wetlands in relation to each other, and to a lesser degree whether forested wetlands are being harvested.

There is inadequate information in Table 1 and Table 2 to infer risks to wetland functions from forest practices because the consequences of any impact to wetland functions is unknown and likely will vary between regions. For example, though there may be a lower potential for forest practices (i.e. road work, harvest of forested wetlands) to impact wetlands in areas where there are few wetlands, these data do not account for the landscape context in which the wetlands occur. In those areas where there are few wetlands the value of individual wetlands may increase for some wetland functions, such as providing habitat niches for certain species of wildlife. Forest practice impacts on wetland functions may be less common in these areas but when there is an impact, the consequences to some functions (i.e. provide habitat) may be greater. For example, the Washington State Department of Ecology recognizes the potential importance of isolated wetlands in eastern Washington in its wetland rating system by giving extra credit to isolated wetlands when rating habitat functions in areas with less than 12" annual rainfall (Hruby 2004<sup>4</sup>).

## **Next steps**

This FPA survey and review is part of a larger forest road and wetland research effort that includes reviewing and synthesizing literature and reviewing data and results from a 2012 DNR Compliance Monitoring haul road sample. When all components (this FPA survey, literature synthesis, and haul road sample) are complete, the results of each will be summarized into a single CMER document. The summary document will include recommendations on follow-up research to address questions about the effectiveness of forest practice rules at preventing loss of wetland function from road construction and maintenance work.

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<sup>4</sup> Hruby, T. 2004. Washington State wetland rating system for eastern Washington – Revised. Washington State Department of Ecology Publication # 04-06-15. <http://www.ecy.wa.gov/biblio/0406015.html>