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Coalition

Protecting and restoring our Olympic forest and aquatic ecosystems

JULY 15, 2010

CONSERVATION ORGANIZATIONS' COMMENTS ON:

DEPARTMENT OF NATURAL RESOURCES *DRAFT EIS OLYMPIC EXPERIMENTAL STATE FOREST (OESF)*

HCP PLANNING UNIT

FOREST LAND PLAN, JUNE 2010

File No: 10-060101

TABLE OF CONTENTS

ENDORSEMENTS

1. **Seattle Audubon Society**
2. **Washington Environmental Council**
3. **Conservation Northwest**
4. **The Mountaineers**
5. **Washington Forest Law Center**
6. **Sierra Club**

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The Olympic Forest Coalition is submitting comprehensive comments on the DNR OESF DEIS. It has two sections: Chapter 1) Main Concerns, and Chapter 2) Technical Comment Papers.

The main points of concern are:

- An irresolvable contradiction between drafting a plan for an Experimental Forest, and basing it on current harvest policies, which do not include experimentation.
- The DEIS is an analysis of two riparian Alternatives both increasing logging, but is not a management Plan for the OESF. That Plan must follow this DEIS with a decision by the Board of Natural Resources (BNR) and also needs full public review under SEPA.
- The No-Action alternative is not no action or an accurate baseline against which to judge impacts of alternatives. The So-Called No Action Alternative provides for a harvest 30% larger than that currently approved by the Board on Natural Resources.
- The Landscape Plan Alternative has an 80% logging increase in the first decade. Neither Alternative is "with less environmental impact." A violation of SEPA.
- The Landscape Alternative increases riparian impacts on 97% of Type 3 watersheds (DEIS, p. 168-170,), thus probably violating the Clean Water Act's anti-degradation provisions and temperature standards, especially for Bull Trout and the DNR HCP's requirements in the Riparian Conservation Objectives, HCP, IV.107. It could be a death knell for Chinook on the western Peninsula.
- The DEIS proposes increasing the impacts on Marbled Murrelets beyond current practices and Northern Spotted Owls beyond those allowed in the DNR HCP, when using the HCP inventory. It totally omits mention of the Threatened Bull Trout, on which the FWS has written a Biological Opinion requiring protections.
- The Woodstock or Landscape Estate Model used for the Landscape Alternative is internal to DNR and is not available for peer review. It appears to still be under modification.
- The analysis on pages 64-5 raises serious questions as to the financial feasibility of both alternatives, but especially the Landscape Plan. However, the HCP Implementation Agreement states that "Failure by DNR to ensure adequate funding is provided to implement the HCP shall be grounds for suspension or partial suspension of the ITP." (HCP, B.6)
- DEIS failed to include the Demonstrations Projects required in the Settlement Agreement, WEC vs. Sutherland, section II.A.

Seattle Audubon has reviewed the OFCO Comments on the DNR OESF DEIS Chapter 1) Main Concerns, and supports it. We have also reviewed the comments on Marbled Murrelets and on the Northern Spotted Owl, and support those as well. We have not reviewed the other Technical Comment Papers and have no opinion on them.

Executive Director
Seattle Audubon
July 14, 2010

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- The Landscape Plan Alternative has an 80% logging increase in the first decade. Neither Alternative is "with less environmental impact"(less than what? Less than "no action"?), which is a violation of SEPA.
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Our organization has reviewed Chapter 1) Main Concerns and supports it. We have not reviewed the all of the Technical Comment Papers and have no opinion on them. If one of those papers was authored by a member of our staff, we do support that individual paper.

Our Organization supports the first chapter of the OFCO Comments on the DNR OESF DEIS:

Becky Kelley

Washington Environmental Council
7/13/2010

lympic Forest Coalition

Protecting and restoring our Olympic forest and aquatic ecosystems

The Olympic Forest Coalition is submitting comments on the DNR OESF DEIS. It has two sections:

Chapter 1) Main Concerns, and Chapter 2) Technical Comment Papers. Conservation Northwest supports these comments.

The main points of concern are:

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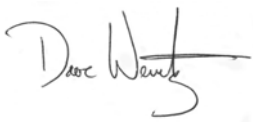
Sincerely,



Dave Werntz
Science and Conservation Director
Conservation Northwest

July 12, 2010

lympic Forest Coalition

Protecting and restoring our Olympic forest and aquatic ecosystems

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Our Organization Supports the first chapter of the OFCO Comments on the DNR OESF DEIS:

Martinique Cruz
Signature

Mountaineers
Organization Name

July 12, 2010
Date

Olympic Forest Coalition, P.O. Box 461, Quilcene, WA 98376
www.olympicforest.org • info@olympicforest.org

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Signature

Washington Forest Law Center
Organization Name

7/12/10 Date

Sierra Club signature for sign on to

OFCO comments to DEIS for Olympic Experimental State Forest Land Plan

Llyn Doremus

Chairperson, Public Lands Committee

Cascade Chapter

July 14, 2010

BIOGRAPHIES

Coleman Byrnes is a semi-retired fish and wildlife biologist but is still working part time for Clallam County. He has a fisheries degree from the University of Washington (1967) and has worked for county, state, federal and tribal entities as well as for private consultants and educational institutions. He and his wife were presented with a community service award for their environmental volunteer work in April 2010. He is a member of the Olympic Forest Coalition Board.

Herbert C. Curl PhD After serving on the graduate faculty of the Department of Oceanography, Oregon State University, for thirteen years Dr. Curl joined the National Oceanic and Atmospheric Administration where he was Fisheries Oceanography Coordinator and subsequently Chief of the Marine Assessment Research Division at the Pacific Marine Environmental Laboratory. A member of Washington Ornithological Society, he organized and coordinated the Neighborhood Bird Project surveys for Seattle Audubon and has represented Seattle Audubon on the Invasive Species Coalition and the Windpower Siting Guidelines Working Group for the WDFW.

Miguel Perez Gibson, MA, LMHC. Saint Martin's University, Counseling Psychology, BA, The Evergreen State College, Native American Studies, AS, Forest Technology Peninsula College. Miguel is a consultant , dba, NACA'N. He previously has worked for the House Democratic Caucus as a policy analyst, and as a Forester and Executive for the Washington State Department of Natural Resources.

Hellmut Golde, PhD, Professor Emeritus. PhD Stanford, 1959, Electrical Engineering. Joined the faculty at the University of Washington in 1960 and was one of the co-founders of the Computer Science Department. He is currently Board a member of the Northwest Fund for the Environment and Heritage University in Toppenish, WA.

Marcy Golde, MA Stanford, 1957 History. Member and worked with WEC on WA Forestry issues since 1979. Participated in TFW Negotiations and implementation; awarded the Alexander Calder award for that work. I participated in Forest and Fish negotiations for WEC. She is currently a board member for Olympic Forest Coalition.

Mike Haggerty, B.S. Environmental Engineering Geology WWU 1994, M.S. Hydrology/Environmental Geology WWU 1995. From 1995 to present Mike has worked as a fisheries hydrologist in Washington, Oregon, and Alaska for Tribes, state, federal, and local governments. Since 1997 his work has been primarily been focused on fish habitat issues on the Olympic Peninsula. He began private consulting in 2001 and has provided technical services to the Olympic Forest Coalition since 2007.

Mark Hersh, B.S., Biology, 1979, Pennsylvania State University; M.S. Water Resources, 1986, Iowa State University. He has been working for Wild Fish Conservancy since 2005. Before that, he worked as a biologist for the US Environmental Protection Agency, the US Fish and Wildlife Service, and held positions in academia, with other conservation groups, and in state government.

David Mann, JD., Lewis & Clark Law School, 1991. David is a partner with Gendler & Mann, LLP., where he represents state and local environmental and public interest organizations in litigation and appeals involving federal and state environmental and land use laws. David is a former director and president of the Washington Environmental Council and currently serves as president of the Northwest Fund for the Environment.

Chris Mendoza, B.S. The Evergreen State College 1993, M.E.S. The Evergreen State College – current. From 1993 – 1995 Chris worked for the Olympic National Park and the U.S. Fish and Wildlife Service as a fish biologist. His work focused on the capture and acquisition of native salmon and trout as part of the Elwha Dam removal and river restoration efforts. From 1995 – 2004 Chris worked for private forestlands owners conducting Washington Watershed Analysis and developing Federal Habitat Conservation Plans. From 2004 to present Chris has been the science representative for a conglomeration of Environmental Organizations (the Conservation Caucus) as part of the Washington Forest Practices Habitat Conservation Plan's Adaptive Management Program.

Professor David R. Montgomery graduated from Stanford University in 1984 with a B.S. in geology and from U.C. Berkeley in 1991 with a Ph.D. in geomorphology. He is a professor of geomorphology in the Department of Earth & Space Sciences at the University of Washington, and a 2008 Macarthur Fellow.

Shelley Spalding, B.A. University of California 1962, M.E.S. The Evergreen State College 1994. From 1994 – 2009 Shelley worked as a fisheries biologist for Tribes, WDFW, Olympic National Forest and U.S. Fish and Wildlife Service's Endangered Species Division. Her work has focused on bull trout listing, critical habitat, recovery, and habitat requirements. She retired from USFWS in December 2008 and is currently a board member for Olympic Forest Coalition and Great Old Broads for Wilderness.

Toby Thaler, J.D. University of Washington 1976. Toby has worked on natural resource law and policy for over thirty years. Toby lead the conservation caucus during the Forests and Fish negotiations in the late 1990s. During that effort and after he has become familiar with adaptive management, including filing an amicus brief on behalf of five scientists at the state supreme court (supportive opinion on that issue), and obtaining a successful result before the Seattle Hearing Examiner. He is currently in private practice and is a board member for the Olympic Forest Coalition.

Dave Werntz, Science and Conservation Director, has an MS in Forest Ecosystem Analysis and Conservation Biology from University of Washington in 1994. He has been at Conservation Northwest since then, focusing on public forest and endangered species conservation. He now directs and manages Conservation Northwest's campaigns and conservation programs. Previous to that Dave worked for National Audubon Society, The Wilderness Society, the US Forest Service, and the US Fish and Wildlife Service.

Kara Whittaker, PhD, University of Washington, 2007, Urban Ecology. MS, University of Wisconsin-Milwaukee, 2000, Behavioral Ecology. Kara is the Staff Scientist & Policy Analyst at the Washington Forest Law Center. For her doctoral research at the UW College of Forest Resources, she studied the dispersal, survival, and habitat use of native forest songbirds in the Seattle metropolitan area. Kara also participated in an interdisciplinary program in Urban Ecology at the UW on a team which investigated the use of Best Available Science in the environmental policy process.

Part I: Major Concerns and Conservation Alternative

A. **Dave Mann letter**
B. **OFCO Alternative**

GENDLER & MANN, LLP

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July 14, 2010

Washington Department of Natural Resources
SEPA Center
P.O. Box 47015
Olympia, WA 98504-7015

Re: Comments on OESF HCP Planning Unit Forest Land Plan DEIS

Dear DNR:

The following comments are offered on behalf of the Olympic Forest Coalition.

By way of brief overview, the DEIS for the OESF HCP Planning Unit Forest Land Plan is seriously deficient in at least the following ways: (1) it fails to define the agency action and to clearly define the DNR's objectives; (2) it is based on inaccurate and incomplete information, including incomplete information on marbled murrelets; (3) it relies on an unreasonably narrow definition of the project objectives eliminating serious consideration of alternatives; (4) it fails to analyze alternatives to the proposed action and relies on a false "No Action" alternative; and (5) it includes a Landscape Alternative that appears to violate DNR's mandate to comply with the ESA and HCP as well as the Clean Water Act. We believe strongly that these deficiencies are significant enough to render the DEIS fatally flawed and therefore unreasonable.

The DEIS should be withdrawn and once DNR has adopted its Marbled Murrelet Long-Term Conservation Strategy the DEIS should be re-issued including an alternative that complies with the HCP, Protects Marbled Murrelets and protects water quality.

A. Introductory Comments:

1. <u>The DEIS must define the agency action</u>

The fact sheet must include a statement of the "nature of the proposal" and "nature or type of final agency action" and the date that the agency expects to take the action. WAC 197-11-440(2)(a), (i). What is the proposal? What is the agency action? When is the agency expecting take action? Adopting a Final EIS is not an action. An EIS is a document that is prepared in order for agencies and

citizens to understand the environmental impacts of a particular action. An EIS is not, therefore a stand-alone document. WAC 197-11-400(1), (2).

2. The DEIS must include an alternative that complies with the HCP protects water quality and complies with the trust mandate and other applicable Public Lands Act requirements

While discussed in more detail below and in the included technical review papers, the true objectives that DNR is *required* to meet in any management plan for the OESF are: (1) comply with the ESA, including the HCP and protecting Marbled Murrelets; (2) Comply with federal and state water quality laws.[1] (3) comply with the trust mandate, including comply with all applicable laws. Unfortunately, it appears that neither the "No Action" alternative nor Landscape alternative comply with the HCP or protect water quality. The DEIS must include an alternative that meets DNR mandatory objectives along with alternatives that approximate the mandatory objectives but at a lower environmental cost or with less environmental degradation.

3. The DEIS must contain complete and accurate information

The information in the EIS must be "complete and accurate" and allow the decision maker and public to make a fully informed evaluation of the alternatives available *Natural Resources Defense Council v. U.S. Forest Service,* 421 F.3d 797, 813 (9th Cir. 2005). It is unacceptable for an agency to release even a draft EIS that knowingly contains false or inaccurate information that they agency knows will confuse and lead to the wrong conclusion. The Executive Summary at page 1, highlights that the Draft EIS contains errors and that DNR knowingly has published the DEIS with these errors included and that the errors might lead reviewers to a wrong conclusion. This is a fatal defect. Similarly, at page 193 the DEIS acknowledges that "due to omission errors and the current lack in the extent of DNR's hydrographic dataset, the analysis [Sediment Delivery] may not be accurate. Further, in the DEIS discussion of marbled murrelets at least two different murrelet habitat estimates are included.

In addition to being an embarrassment for DNR, both of these statements highlight a fatally defective DEIS. Why does the DEIS even bother to present an "analysis" when the authors know that the data is not accurate?

It is also unacceptable to release a DEIS with known incomplete information. Indeed, the DEIS acknowledges that additional analysis is needed on at least the following topics: (1) road costs (p. 63); (2) road needs for thinning (p. 64); (3) Marbled Murrelet strategies under the Science Report (p. 65-66); (4) Water Quality (p.210); (5) Northern Spotted Owl models (p. 247); and Carbon sequestration (p. 269); (6) fails to disclose or analyze management proposals or their impacts for all T5 waters, which are 62% of the whole stream network (DEIS, p. 125); (7) the Settlement Agreement for WEC vs. Sutherland

1 The DEIS fails to comply with the trust mandate by failing to analyze the relationship of proposed timber harvest levels with non-timber resources; the sustainability of the timber harvest is not evaluated. Ch. 79.10 RCW.

(Section II.A) explicitly requires a Demonstration Project on Bio-diversity Pathways, but none is mentioned in the DEIS.[2]

The combination of known inaccuracies and known missing information renders the entire DEIS suspect and mandates preparation of a new DEIS with "complete and accurate" information.

4. <u>The DEIS is difficult, if not impossible, to understand</u>

The SEPA rules mandate that the EIS be "readable" so that the reader "understands the most significant and vital information concerning the proposed action, alternatives, and impacts without turning to other documents." WAC 197-11-425(1). Further, the EIS must be concise and written in plain language." WAC 197-11-425(2). Finally, the EIS must "explain plainly the meaning of technical terms not generally understood by the general public." WAC 197-11-425(2). This DEIS fails all of these basic requirements.

Unfortunately, critical sections, including the "Project Purpose" section of the DEIS are almost incomprehensible to both technical and non-technical reviewers. By way of just one example, the following sentence on page 22 is unfortunately typical of the DEIS as a whole:

> The central purpose of the forest planning process is to identify those *management activities* that are most likely to achieve *the stated objectives* in an *efficient and effective manner*.

What does this mean in plain English?

What are "management activities"? Is this another word for logging? If so, why doesn't the DEIS state flat out that DNR's purpose is to allow logging of the Olympic Experimental Forest? Instead it relies upon the term "management activity" or an industry-defined "Silviculture" (footnote 2, page 23) that itself only refers to "growing and tending forest crops."

How do "management activities" differ from "management strategies?" How do "management activities" and "management strategies" differ from "management regimes?" How do the "stated objectives" differ from the "measurable objectives?"[3]

Similarly, the critical description of the "Landscape Alternative" on page 50 is nearly impossible to decipher. According to the DEIS, the primary difference between the "No Action" alternative and the "Landscape Alternative" is:

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2 In the regularly scheduled June 10, 2010 and July 8, 2010, meetings with the "settlement partners" in WEC v. Sutherland, King County Superior Court Cause No. 04-2-264671-8SEA, DNR has explicitly confirmed missing analyses from the DEIS that "will be included in the FEIS."

3 In the above-cited settlement partners' conversations, DNR has admitted that a main purpose of the OESF Plan is to establish the specific timber harvest policies that will be applied in the riparian zones. While the impacts of the proposed action make this purpose apparent, nowhere does the DEIS clearly "state this management objective."

> That the [Twelve-Step] assessment is incorporated into a decision-making framework – in this case, the forest estate model – and is used to guide the scheduling of management activities.

What does this mean?

In recognition that the short explanation was probably meaningless, the DEIS continues:

> In other words, the Landscape Alternative represents a formal process of integrating a set of riparian assessment criteria and indicators within a forest-estate model to recommend Type 3 watershed riparian conservation strategies across the OESF, rather than doing an independent assessment of Type 3 watersheds as in the No Action Alternative.

Again, what does this mean in plain English? Are you taking one model (the Twelve-Step) and putting the results into another model? What is the result? Is a "guide to scheduling management activities" another phrase for timber sales?

It is critical that both technical and non-technical reviewers clearly understand the most significant and vital information concerning the proposed action, alternatives, and impacts without turning to other documents." WAC 197-11-425(1). The DEIS explanation of the alternatives fails this basic SEPA requirement.

As a whole the DEIS appears to have been written by "insiders" for "insiders" and fails any test of reasonableness.

B. Chapter 1: Background

1. <u>The DEIS fails to clearly identify the "Proposal" and the "Proposal's Objectives."</u>

As discussed above, with respect to the "Fact Sheet" the DEIS fails to clearly and concisely identify either the "proposal" or the "proposal's objectives. Both of subjects are critical to the success of environmental review. The EIS "shall be concise, clear, and to the point." WAC 197-11-400(3).

A "proposal" means a "proposed action." WAC 197-11-784. For a non-project action, this means that the agency is planning on adopting or amending a policy, plan or program. WAC 197-11-704(2)(b)(iii). What precisely is the "action" that is going to take place after the completion of the EIS process? This must be clearly stated.

The DEIS must also clearly and concisely identify the proposal's objective. Because the "reasonable alternatives" are defined as actions that can feasibly attain or approximate a "proposal's objectives, but at a lower environmental cost or decreased degradation, identification of the precise "proposal's objectives" is critical for the subsequent development of and consideration of alternatives. As discussed above, the "project purpose" section of the DEIS is both vague and impossible to understand.

2. <u>The "Measurable Objectives" are unreasonably narrow</u>

The DEIS identifies three "measurable objectives," at page 22, these objectives are unreasonably narrow and consequently bias the formation of alternatives. An agency may not define the objectives of its action in terms so unreasonably narrow that only the agency's alternative, instead of more environmentally benign alternatives satisfy the objectives. *Carmel by the Sea v. U.S. Dept. of Transportation,* 123 F.3d 1142, 1155 (9th Cir., 1997).

Measurement Objective 1 (increasing recruitment for large, woody debris and shade) appears driven by the requirement to protect water quality. Limiting the objective to two narrow prescriptions ignores the over-riding objective – clean and cool water. Indeed, the DEIS elsewhere confirms that "DNR's overarching management guidance has been to follow state and federal laws to protect water quality." DEIS, Page 207. Measurement Objective 1 would be better stated as: "Meet state and federal laws to protect water quality."

Measurement Objective 2 (Attain and maintain 20/40 percent old/young and better forest) states that the objective is to support the conservation of the northern spotted owl *and* marbled murrelet. Again, limiting the objective to a single narrow prescription ignores the over-riding objective. More importantly, as discussed below, because the state has not yet developed its long-term murrelet conservation strategy for western Washington under the "science report" (Raphael et al. 2008), it is premature to assume that the 20/40 target fulfills this objective.

Measurement Objective 2 would be better stated as: "Comply with the Endangered Species Act and the HCP *and* protect marbled murrelets, spotted owls, and bull trout."

Measurement Objective 3 (sell approximately 576 million board feet over a decade) is an overly narrow objective. The BNR has authority, and indeed a duty, to reduce the sustainable harvest yield if necessary to meet other statutory directives. RCW 79.10.320. Thus, if compliance with statutes including the Clean Water Act and Endangered Species Act dictate a reduction in the sustained harvest calculation, then that number can and must be reduced. Limiting the review of alternatives to those that will attain this temporary number is inappropriate. Management Objective 3 would be better stated as "Provide for sustainable harvest that complies with all other statutory requirements."

C. Chapter 2: Alternatives

The "alternatives" section of an EIS is required to describe and present the proposal as well as "reasonable alternatives" that "could feasibly attain or approximate a proposal's objectives, but at a lower environmental cost or decreased level of environmental degradation." WAC 197-11-440(5). This section has been described as the "lynchpin" of the EIS. The DEIS fails to satisfy the requirement for a reasonable discussion of alternatives in at least the following ways.

1. <u>The "No-Action" Alternative described in the DEIS is not the status quo</u>

In describing the "no-action" alternative, the agency is required to review and analyzed the proposed action's impacts against the "existing uses, not theoretical uses." *Chuckanut Conservancy v.*

Washington State DNR, ___ P.3d ____ (May 24, 2010). The "No Action Alternative" fails to present the true "status quo."

Table 2-9 indicates that the harvest level under the reviewed "no-action" alternative is 75 mmbf/yr or 750 mmbf/decade. This is not the status quo. The BNR approved current sustainable harvest number is 576 mmbf/decade. It appears therefore, that the "no-action" alternative analyzed in the DEIS is based on a significant increase in harvest over the maximum allowed by sustainable harvest. The DEIS must be rewritten to accurately analyze impacts under the "no-action" alternative as the impacts occurring under current harvest rates.

2. The DEIS fails to examine more than one alternative

The DEIS examines only the proposed action and the "no action" alternative. SEPA itself mandates the EIS examiner "alternative***s****"* to the proposed action. RCW 43.21C.030. The term "alternatives" is plural, not singular, thus requiring more than a single alternative to the proposal. This plural requirement continues through the SEPA rules. WAC 197-11-440(5)(a) requires the EIS to examine the proposal and "alternative cours***es*** of action." Similarly, WAC 197-11-440(5)(b)(ii) mandates that the "no action" alternative "shall be evaluated and compared to other alternative***s***."

The DEIS must be re-written to include the proposal, a true "no-action" alternative and other alternative***s***.

3. The alternatives are unreasonably skewed by the overly narrow objectives

The DEIS confirms at page 41 that only the Landscape Alternative meets the "purpose and need or scoping objectives" and therefore is the only alternative considered. As discussed above, the stated "measurable objectives" used for evaluating alternatives are unreasonably narrow and, as a consequence, result in a DEIS that is skewed sharply in favor of the agency's objective. This renders the EIS a "foreordained formality." *Friends of Southeast's Future v. Morrison,* 153 F.3d 1059, 1066 (9th Cir. 1998); *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991), *cert. denied*, 502 U.S. 994.

The SEPA rules confirm that "proposal should be described in ways that encourage considering and comparing alternatives." WAC 197-11-060(3)(a)(iii). If, as suggested above the measurable objectives were stated as (1) Comply with federal and state laws protecting water quality; (2) comply with the ESA (including the HCP and protect marbled murrelets); and (3) provide for sustainable harvest that complies with other laws; the DEIS would encourage other alternatives.

4. Alternatives that should be reviewed in the DEIS and FEIS

The following alternatives should be considered in a revised DEIS.

a. The attached Conservation Caucus Alternative

b. An alternative that ***actually complies*** with federal and state laws protecting water quality, ***actually complies*** with the HCP and protects marbled murrelets and bull trout.

c. An alternative that eliminates commercial harvest within the riparian zone

d. A "no action" alternative based on actual, current sustainable harvest numbers.

5. <u>The Landscape Alternative conflicts with the HCP</u>

It appears that the Landscape Alternative ("LA") fails to satisfy DNR's objective of meeting the HCP in at least the following ways:

- The LA appears to result in increased impacts on Marbled Murrelets by increasing the harvest in the buffers on Occupied Sites to a total of 2008 acres (408 acres of variable retention harvest, plus 1600 acres of thinning) in the first decade.
- The LA fails to consider the use of corrected polygons for Marbled Murrelet Occupied Sites as recommended in the Science Report
- The LA fails to consider or analyze the Marbled Murrelet Management Area strategy described in the Science Report
- The DEIS for the LA fails to analyze for impacts on bull trout – despite greatly increasing riparian harvest.
- The stated goal of the OESF in the HCP is to "integrate production and conservation across the landscape", yet:
    - The LA increases commercial harvest by 80% in the first decade and 107% over 100 years, while reducing protections for one criterion in 97% of the Type 3 Watersheds (DEIS, p. 170).
    - There is no funding currently available or direct provision for experimental silviculture (despite its requirement in the Settlement Agreement)
- The HCP requires 60-70% Complex Forest at year 100, while the LA projects only 41%.
- The HCP requires that the OESF "shall be managed to: maintain and aid restoration of …[the 5 Conservation Objectives] (HCP IV-107), yet a significant number of Type 3 Watersheds are predicted to experience Probable Significant, Adverse Environmental Impacts for one or more of the riparian indicators, such as large woody debris, shade and microclimate. (DEIS p.170).
- The DEIS contains no analysis of the amount or aquatic impacts of new and reconstructed roads, despite the doubling of harvest under the LA with its heavy reliance on road intensive thinning.
- The HCP requires adequate funding "Failure by DNR to ensure adequate funding is provided to implement the HCP shall be grounds for suspension or partial suspension." HCP 8.6. Despite this mandate, the DEIS analysis on pages 64-65 raises serious questions as to the financial feasibility of both alternatives, but especially the LA.

6. <u>The Landscape Alternative violates the Clean Water Act</u>

The Clean Water Act's "anti-degradation" policy prohibits new actions that degrade water quality in currently high quality waters. According to Table 3-47, the Landscape Alternative will significantly increase riparian impacts to Type 3 waters, including a tripling of probable significant impacts to shade and a ten-fold increase in probable significant impacts to riparian microclimates. It appears, therefore,

that implementation of the Landscape Alternative may violate the anti-degradation policy. The DEIS must include an alternative that meets the Clean Water Act.

7. Additional Comments on Chapter 2

Page 43: the DEIS states DNR forest management objectives are: "revenue generation and habitat conservation." Why does this statement ignore the protection of water quality?

Pages 57-58: the DEIS confirms that there may be a modeling error resulting in an appearance that HCP targets are not being met. Why was the DEIS produced with knowing errors?

Page 59, Table 2-7: It appears that neither alternative meets the HCP projections for forest habitat. Why doesn't the DEIS contain an alternative that meets the objectives of the HCP?

Page 60, Table 2-8: It appears that neither alternative meets the HCP goal for complex forest in 2100. Why doesn't the DEIS contain an alternative that meets the objectives of the HCP?

Pages 63-64: The public and interested agencies have the right to review and comment on complete and accurate information. The DEIS must be re-issued with the necessary compiled information on road costs and modeling for "thinning."

Page 65-66: It is not appropriate to issue a DEIS without addressing long term impacts to Marbled Murrelets – particularly since the DNR-commissioned Science Report (Raphael et al. 2008) is complete. The Science Report recommendations for marbled murrelets should be adopted in their entirety now in the Long Term Marbled Murrelet Management Plan and then the DEIS re-written including this analysis.

D. Chapter 3: Analysis

The focus of these comments is to identify issues pertaining to the first two chapters of the EIS. Technical comments on Chapter 3 will come through separate technical reviews. There are at least three significant deficiencies in the Analysis chapter that should be highlighted.

1. The DEIS fails to address impacts to bull trout

Bull trout were listed by the U.S. Fish and Wildlife Service (USFWS) in 1999 as a threatened species throughout their range in the United States. In anticipation of that listing, in 1998 USFWS reinitiated the Biological Opinion and Conference Opinion on the Washington State Department of Natural Resources (DNR) Habitat Conservation Plan (HCP) to include an analysis of potential impacts to bull trout from activities covered by the HCP. The DEIS makes no mention of bull trout being a listed species nor does it refer to a conservation strategy for the fish as it does for other ESA listed species such as marbled murrelets and spotted owls. Bull trout are found in streams throughout the OESF, including Cedar, Mosquito, Goodman, Matheny, and Kalaloch Creeks as well as the Hoh, Calawah, and Queets Rivers.

While the DEIS states that "nearly every Type 3 watershed is projected to experience detectable impacts to at least one indicator under the Landscape Alternative (97 percent) of the Type 3 watersheds; and to

a lesser degree, under the No Action Alternative (77 percent) (DEIS, p. 170), it fails to analyze the impacts of these changes on listed bull trout.

2. The DEIS must include an accurate estimate of marbled murrelet habitat within the OESF

As discussed above, the information in the EIS must be "complete and accurate" and allow the decision maker and public to make a fully informed evaluation of the alternatives available *Natural Resources Defense Council v. U.S. Forest Service,* 421 F.3d 797, 813 (9th Cir. 2005).

Accurate estimates of the current amount of murrelet habitat in the OESF are critical for assessing the environmental impacts of the various alternatives over time. Unfortunately, two different murrelet habitat estimates are presented in the DEIS (page 257, page 259). Further, three additional estimates can be found in Minkova 2009 (Appendix I), WNDR 2010 (Appendix II), one of which was developed as part of the 2008 Science Report, and none of which were presented in the DEIS.

The DEIS must describe which estimate is being used for each alternative and explain why it was chosen over other estimates.

3. The DEIS appears to significantly overstate background erosion rates

Chart 3-74, which compares background erosion rates and road sediment delivery rates, shows a background rate of about $2x10^6$ tons per stream mile per year as the background erosion rate. For a typical drainage density of 6 miles of stream per square mile for the drainage basins on the western Olympic Peninsula in the area of the OESF this would translate into an average background landscape erosion rate of $1.2x10^7$ tons per square mile per year ($4.68x10^6$ tons km^{-2} yr^{-1}). Assuming that the soil has a bulk density of 1200 kg/m^3 (1.2 tons/m^3) this is equivalent to a landscape lowering rate of more than 10 feet per year (3.8 m yr^{-1})! Obviously this is not accurate.

The erosion rates from the papers that the EIS cites as the source for the background erosion rates (Brandon and others, 1998; Montgomery and Brandon, 2002; and Belmont and others, 2007) range from about 0.1 to 1.0 mm/yr for the Olympic Peninsula, with rates of about 0.5 mm/yr providing a reasonable upper bound for the area covered by the OESF Draft EIS.

This erosion rate (0.5 mm/yr) is equivalent to about 1500 tons per square mile per year (again, assuming that the soil has a bulk density of 1200 kg/m^3, equivalent to 1.2 tons/m^3). Given the typical drainage density of 6 miles of stream per square mile of watershed portrayed on the DNR hydro layer for the drainage basins on the western Olympic Peninsula in the area of the OESF, this would translate into a background sediment delivery rate of just over *250 tons per stream mile per year.* This is, of course, significantly less than the 2,000,000 tons per stream mile used as the background level in Chart 3-74.

Against this background rate of sediment delivery, the projected sediment delivery of about 10^4 tons per stream mile per year under both No Action and Landscape alternatives would appear to have the potential for significant adverse impacts to stream sediment loads.

The DEIS must be re-written with accurate background sediment delivery rates and an accurate comparison of those rates to rates anticipated by the two alternatives. Because DNR has a mandate to protect water quality, the DEIS must also include an alternative that does not significantly increase sediment delivery rates.

4. The DEIS fails to establish a scientifically valid adaptive management process

Adaptive management is a process whereby monitoring of well-defined resource impact questions lead to changes in management. The OESF is subject to a series of explicit adaptive management requirements regarding riparian resources and ESA listed species. The single most important management change to address is the location and quantity of allowed timber harvests and the impacts to those resources identified during monitoring.

While the DEIS acknowledges that adaptive management of forest practices at the landscape scale, such as the OESF, has largely been a failure, the DEIS does not change the current management direction to address these issues, nor does it evaluate the impacts to timber and non-timber resources likely to occur over time as a result.

The DEIS must include an analysis of the impacts of a failed adaptive management process, as well as an alternative that displays the costs and results if the process were to be made successful.

E. Summary

In summary, we strongly believe that these deficiencies are significant enough to render the DEIS fatally flawed and therefore unreasonable. The DEIS should be withdrawn, and once DNR has adopted its Marbled Murrelet Long-Term Conservation Strategy the DEIS should be re-issued including an alternative that complies with the HCP, and protects marbled murrelets, spotted owls, bull trout, and water quality.

We look forward to your response to these comments. Please do not hesitate to contact me if you have any questions.

Very truly yours,

GENDLER & MANN, LLP

David S. Mann

David S. Mann

Conservation Caucus Alternative

Conservation Caucus requests this additional alternative be fully analyzed and included, when the OESF Landscape Plan EIS is rewritten.

Background of this Alternative: The Conservation Caucus of the Settlement Agreement with DNR reviewed the May, 2008 Draft OESF Forest Land Planning Range of Alternatives. We found the range of alternatives even then to be insufficient. Therefore, we drafted an additional Alternative.

The current OESF DEIS is even more inadequate, and uses a potentially illegal limited range of alternatives. We recommend that this Conservation Caucus Alternative be analyzed in its entirety exactly as all other alternatives are analyzed. We believe it meets the definition of a Reasonable Alternative: *"Reasonable alternatives shall include actions that could feasibly attain or approximate a proposal's objectives, but at a lower environmental cost or decreased level of environmental degradation."* WAC 197-11-440-(6)(b); 197-11-786. (Emphasis added.) It is the only alternative which has a lower environmental cost and decreased level of degradation.

OESF Landscape Plan - Integrated Production, Conservation and Research

PURPOSES:

To develop a timber management plan which will "Meet state and federal laws to protect water quality."; which will "Comply with the Endangered Species Act and the HCP and protect marbled murrelets, spotted owls, and bull trout."; and which will "Provide for sustainable harvest that complies with all other statutory requirements

" Enable DNR to conduct management and research activities within the Olympic Experimental State Forest in areas currently occupied by listed species in order to build new knowledge relevant to trust management obligations and species conservation;" (DEIS on HCP, p. 1-4)

"To benefit the trusts by integrating production and conservation across the landscape." [HCP, IV.81]

INTENT: *"To have a forest that includes a full range of forest conditions in order to ensure that trust revenues are produced, quality timber is available for harvest, and native species have sufficient habitat. In this approach, harvestable timber and habitat for northern spotted owl, marbled murrelet, and salmon become outputs of a well-managed, unzoned forest." [HCP, IV.81]*

Since the HCP was completed several environmental laws have been strengthened, they include: the Forest and Fish version of the Forest Practices Act and the State WQ Standards and anti-degradation requirements. In addition the salmonids and bull trout have been listed as threatened under the Endangered Species Act. Thus these changes apply on the OESF and under the HCP.

NOTES: Underlining is for emphasis added by Conservation Caucus; *italics are used only for quotes from the HCP and its DEIS*.

Significant Issues	**ALTERNATIVE** Integrated Production, Conservation, and Research (Including HCP required sections, plus those which recommend or assume compliance.)
Scope of Plan	FULL INTEGRATION OF PRODUCTION AND CONSERVATION AND MONTORING, RESEARCH AND INFORMATION SHARING. • *"5. Enable DNR to conduct management and research activities within the Olympic Experimental State Forest in areas currently occupied by listed species in order to build new knowledge relevant to trust management obligations and species conservation;" (DEIS on HCP, p. 1-4)* • *"…the goal of the OESF is to learn how to integrate production and conservation across the landscape." [HCP, IV.81]* • *"There are three components of this experiment: (a) habitat conservation strategies based on an experimental concept of an "unzoned" forest, that is, a forest without areas deferred from timber management; (b) a commitment to monitoring, research, and information sharing as a basis for experimental management; and (c) creation of a process for integrating intentional learning with management decision making and course adjustments." (HCP, I.15)* • *"One of the underlying hypotheses of integrating production and conservation in the Experimental Forest is that it is possible to produce quality commercial timber and provide and protect ecological values in a managed forest by maintaining an arrangement of forest structure and stand diversity.".(HCP, IV. 83)* SIX MANAGEMENT PROCESSES FOR OESF (HCP, IV.82) • *"(1) research and monitoring, (HCP, IV.82)* • *(2) planning from a landscape perspective, (HCP, IV.83)* • *(3) silvicultural techniques that integrate production and conservation,* o *"Activities that emphasize both commodity production and ecological function can be designed at the stand level with attention to what is retained as well as what is removed and at the landscape level with attention to the arrangements of structures to be developed in and across multiple stands to meet desired patterns." (HCP, IV.84)* • *(4) systematic application of knowledge gained, (HCP, IV.84)* • *(5) efficient information management, (HCP, IV.85)* • *(6) effective communication." HCP, (IV.85)* RIPARIAN BUFFERS ARE FOUNDATION OF LANDSCAPE PLANS *"Riparian buffers will serve as the foundation for landscape plans, around which forest management, conservation, and research activities will be designed." [HCP, IV.126]*
Research,Monitoring and Adaptive Management	INTEGRATION OF MANAGEMENT AND RESEARCH AND MONITORING • *"All conservation, research, and management strategies were designed in concert to achieve an integrated management approach." (HCP, IV.106)* • *"Because the Experimental Forest has a special mission of learning how to integrate timber production and habitat conservation across the landscape the spotted owl, riparian, and multispecies conservation strategies for the OESF Planning Unit are unique, with more emphasis than in the other planning units on experimentation, research, monitoring and systematic application of new knowledge." (HCP, IV. 86)* • *"…focused information – gathering activities and information-management infrastructure are essential. A broad range of formal research, case studies, and monitoring of operations and conditions are included under the heading of research and monitoring. Information-gathering*

	activities carried out in the Experimental Forest, including activities traditionally described as "management experiments", "operational trials", "field evaluations", "case studies", and "demonstrations", will be part of the research and monitoring activities." (See HCP, the sections titled Monitoring and Research in Chapter V.) (HCP, IV.83) • *"Two categories of research and monitoring will occur within the OESF:* *(1) Research and monitoring required for HCP compliance with the Endangered Species Act; and* *(2) Information gathering and analysis required to investigate hypotheses and acquire new knowledge needed to accomplish the mission of the Experimental Forest." (HCP, IV.83)* • *"Management of the Experimental Forest will be planned and implemented at the level of individual activities within the framework of specific plans for each landscape planning unit. These landscape plans will focus and direct the integration of ecosystem, commodity, and informational goals." (HCP, IV.91)* • *"Riparian buffers will serve as the foundation for landscape plans, around which forest management, conservation, and research activities will be designed." (HCP, IV. 126)* • Adaptive Management is required in both the HCP, and the PSF. The OESF plan must address the specific adaptive management requirements of Section 24.5 of the HCP's Implementation Agreement, and should follow the structure described in the HCP Handbook, 65 Fed. Reg. 35342 (June 1, 2000**).** (Conservation Caucus) • Set up Adaptive Management as outlined in the Service's HCP Handbook to cover all components of aquatic, MM and NSO habitat, forest stand condition and trajectories, and compliance with the State's Clean Water Act, for each of the eleven Planning Units. (Conservation Caucus) • Replace the 12-step watershed assessment procedure with updated assessment procedures and models that produce information relevant to INDIVIDUAL forest practice activities – i.e. road sediment assessment based on actual receiving stream substrate characteristics, or stream channel assessment based on actual reach condition and modeling of inputs from reach-specific adjacent forest practices. Models should be based on locally-relevant information, i.e. for road sediment production, based on local geology, local topography, and sediment production based on actual road segment per activity, or use by **all** users, and local stream widths. (Conservation Caucus) • Implement a monitoring program on riparian inputs, functions, and stream channel/habitat condition and response to landuse, climate, flow, and mass wasting. (Conservation Caucus) • Implement a monitoring program on substrate and habitat condition in streams and wetlands receiving run-off from roads or mass wasting inputs. Design forest practices to respond to actual conditions. (Conservation Caucus) • Incorporate the risk of windthrow into scheduling state lands operations in riparian (and wind) buffers. • Work with third parties to pursue active stream restoration.
Land Base for Planning	PLANNING ON EACH OF THE ELEVEN LANDSCAPES • Landscape Plans are to be made for each of the eleven designated landscapes. They can then be shown as a combined effort for the whole OESF. (Restatement of the HCP.) • *"Management of the Experimental Forest will be planned and implemented at the level of individual activities within the framework of specific plans for each landscape planning unit. These landscape plans will focus and direct the integration of ecosystem, commodity, and informational goals." HCP, (IV.91)* • *"DNR's Olympic Region has set preliminary boundaries related to watersheds for landscape planning throughout the region. Eleven of these landscapes lie within the OESF. (See Map IV.9.) It will take time and funding to conduct landscape planning in these landscapes." (HCP, IV.83)* • *"Prior to landscape planning in each of the 11 landscape planning units in the Experimental Forest,…"(IV.87)* • *"Management for desired owl habitat conditions will be planned and implemented at the scale of landscape planning units." (HCP, IV.87)* • "*Therefore, additional analyses for any given landscape planning unit might include water quality, wildlife habitat, non-timber commodity production, urban influences, estuarine/near-shore marine conditions, or other relevant issues." (HCP, IV.127)* • All models that inform the landscape plans must be relevant to local conditions and uses, based on real inventories instead of broad and general assumptions, and must be updated and peer-reviewed.
Innovative	SILVICULTURE AS AN INTEGRATION TOOL • *"Silviculture as an Integration Tool. One of the underlying hypotheses of integrating production*

Silviculture	*and conservation in the Experimental Forest is that it is possible to produce quality commercial timber and provide and protect ecological values in a managed forest by maintaining an arrangement of forest structures and stand diversity." (HCP, IV.83)* • *"Silviculture is linked closely with the landscape planning process and is one of the tools essential for integrating production and conservation." (IV.84)* • *"Activities that emphasize both commodity production and ecological function can be designed at the stand level with attention to what is retained as well as what is removed and at the landscape level with attention to arrangements of structures to be developed in and across multiple stands to meet desired patterns." (HCP, IV.84)* • The alternative includes setting up "demonstration projects in the OESF testing Dr. Andrew Carey's biodiversity pathways treatment principles, which are replicated in several areas and demonstrate the application of different scales of openings, scale of variation and overstory retention on forest management units at a stand level. The demonstration projects will be established with a peer reviewed scientific design intended to replicate the same two or three variations on the same types of stands. These demonstration projects will be developed and implemented as part of the OESF SHIP during the term of this Agreement." [Settlement Agreement, II.A] • The use of innovative silvicultural techniques should be linked directly to Research and Monitoring.
Riparian Conservation	RIPARIAN CONSERVATION STRATEGY MANAGEMENT WITHIN BUFFERS • *"Riparian buffers, therefore, are proposed as the present best means for protecting a number of important habitat features, such as stream bank stability and coarse woody debris inputs, in lieu of a scientifically proven method for protecting all aspects of riparian ecosystems. … . The type and intensity of management activities within proposed riparian buffers will depend on their ability to achieve riparian objectives in the short and long term." (HCP, IV.107)* • *Interior-core Buffers: "Harvesting in interior-core buffers can occur, provided that management activities are consistent with the conservation objectives." (HCP, IV. 109)* • *Exterior Buffers:* o *"Thirty-three percent or less, by volume, of the riparian trees in the designated exterior buffer may be removed for commercial purposes per rotation.* o *…Exterior buffers within a landscape planning unit will not be harvested a second time until the conservation objectives of the riparian strategy are met in that landscape planning unit." (HCP, IV. 117)* • *Type 5 Waters:* o *"Management objectives…are to protect all Type 5 streams that cross unstable ground and occupy stable ground but have identifiable channels with evidence of water discharge or material transport.* o *… .In the OESF, approximately 90 percent of Type 5 streams occupy unstable ground and directly contribute materials to the channel network. About 5 percent have identifiable channels on stable ground." (HCP, IV.111)* • *Wetlands: Forested wetlands: Retain at least 120 square feet basal area.* o *"Harvest within forested buffers of nonforested wetlands* o *No harvest within 50 feet of wetlands edge* o *Harvest within buffers beyond 50 feet designed to maintain stand wind-firmness, as per recommendations for exterior riparian buffers." (HCP, IV.120)* RIPARIAN BUFFERS**:** • *"special protective measures… .* o *mass wasting… .* o *tree blowdown… .* *"Hence, this conservation strategy explicitly addresses these two driving factors by creating riparian buffers designed to minimize mass wasting and windthrow." (HCP, IV.106)* • *"riparian conservation strategy…by establishing:* *(1) interior-core buffers on all stream types…* *(2) exterior wind buffers on all stream types…* *(3) comprehensive road-maintenance plans,* *(4) protection of forested wetlands, and*

(5) a research and monitoring program integrated with on-the-ground riparian protection." (HCP, IV.108-9)

- *"Adhering to the objectives of the riparian conservation strategy and implementing the watershed assessment procedure likely will identify specific activities that can be performed with minimum impact to the ecosystem. For example, the number of trees that can be removed from a riparian buffer in particular watershed will be determined by assessing the potential for that buffer to continue to providing coarse woody debris, stream shade, wind-firm stands, nutrients, sediment storage, stream flow moderation, and aquatic and terrestrial habitat for sensitive species." (HCP, IV.128)*
- *"The objectives of the OESF riparian conservation strategy are to maintain and aid restoration of riparian functions at the watershed scale, rather than at the site-specific level. … .Effective management and conservation strategies are dictated not only by site conditions but also by cumulative effects of management activities both upstream and downstream of the site. Consequently, the watershed assessment should assure that connectivity between riparian segments is accounted for in the design of long-term management, conservation, and research strategies." (HCP, IV.127)*
- *"proposed buffers on streams and streamside habitat account for more than 50 percent of habitat projected for northern spotted owl on DNR-managed lands within the Experimental Forest." (HCP, IV.108)*
- *Riparian "Conservation Objectives… . These objectives reflect the requirements for maintaining habitat that is capable of supporting viable populations of salmonids species, as well as for other non-listed and candidate species dependent on in-stream and riparian environments." (HCP, IV.107)*
- *"The type and intensity of management activities within proposed riparian buffers will depend on their ability to achieve riparian objectives in the short and long term." (HCP, IV.107)*
- *"Table IV.12 shows the number of acres and percent of land base in each buffer category, by forest age class, out of 264,000 total acres of DNR-managed land in the OESF. Approximately 35 percent of the total acres, therefore, will contribute to maintaining and restoring riparian functions and processes. These acres will provide more than 50 percent of the proposed habitat for northern spotted owls and a significant percentage of habitat for marbled murrelets." (HCP, IV. 134)*

Interior-Core Buffer

- *"All Types 1 through 4 streams will be protected with interior-core buffers (Table IV.5)." (HCP, IV.111)*
- *Table IV.5 is titled "Expected average widths of interior-core riparian buffers in the Olympic Experimental State Forest." (HCP, IV.58)*
- *The width of riparian buffers will be determined on a site-specific basis," (HCP, IV.110)*
- *"DNR expects that buffer widths will be <u>on average comparable to those in Table IV.5</u>. …Buffer widths established once the Experimental Forest is under way, therefore, are not expected to vary substantially from those in Table IV.5. (HCP, IV.110)*
- *"Each interior core buffer will be designed to accommodate all channel, floodplain, and hillslope areas susceptible to mass wasting." (HCP, IV.111)*
- *"Statistical analyses of implementing the proposed riparian buffers indicate that approximately 22 percent of the OESF land base will fall inside the interior-core buffer" (HCP, Table IV.12.).*
- *"Expected <u>average</u> widths of interior-core riparian buffers in the Olympic Experimental State Forest …is an average horizontal distances measured outward from the 100-year flood-plain on either side of the stream. Type 1, 2 150' Type 3, 4 100'." [HCP, IV.58]*
- The Conservation Caucus, like the HCP, finds no conflict with interior-core buffers that are both site specific and which meet the average buffer widths in Table IV.5.

Exterior Buffers:

- *Design and layout:*
  "(1) it intends light partial harvests… ;
  (2) it relies on experiments, from which DNR can gain new knowledge… ." (HCP, IV.112)
- *Standard Procedure: "As a starting hypothesis, the average width of exterior buffers will be 150 feet for Type 1 through 3 streams and 50 feet for Type 4 and 5 streams (Table IV.8), measured in horizontal distances laterally from the outer edge of the interior-core buffer on either side of the stream." (HCP, IV. 112)*
- *"…wind buffers will be placed on all riparian segments for which stand wind-firmness cannot be documented by historical information, windthrow modeling, or other scientific means. Thirty-three percent or less, by volume, of the riparian trees in the designated exterior buffer may be removed for commercial purposes per rotation… . Exterior buffers within a landscape planning unit will not be harvested a second time until the conservation objectives of the riparian strategy are met in*

	that landscape planning unit." (HCP, IV.117) • *"…standard practice … will be applied on approximately 75 to 85 percent of the riparian areas in the OESF… . Experiments will be conducted such that the protection and restoration objectives of this riparian strategy will not be knowingly compromised, … ." (HCP, IV.118)* Type 5 Waters • *"…location and size of riparian buffers on Type 5 streams will be made on a case-by-case basis in the field, using a 12-step watershed-assessment procedure… .[and] requires that assessments and proposals for manipulative research or management be reviewed by a qualified physical scientist." (HCP, IV.111)* • *"Type 5 channels with a potential for delivering water, wood, sediment, nutrients, and energy to the channel network will be protected from the active channel margin outward to the topographic break in slope on either side of the channel, as well as upstream to the channel initiation point and downstream to the channel confluence. (See Figure IV.9)" (HCP, IV.112)* • *"Figure IV.9: Example of management protection (riparian buffer) placed on Type 5 channel System" (HCP, IV.113)* Wetlands: • *"The objective of forested-wetlands protection in the Experimental Forest is to maintain and aid natural restoration of wetland hydrologic processes and functions."(HCP,IV.119)* • *"Average buffer widths are measured from the outer edge of the forested wetland. Average buffer widths for forested wetlands: 150 feet for wetlands greater than 5 acres; 100 feet for wetlands 0.25 to 5 acres." (HCP, IV. 120)* • *Disconnect road drainage to wetlands DNR "Statewide, the department will allow no overall net loss of acreage and function of wetlands… ." (Policy for Sustainable Forests, p. 38); Conservation Objectives: "(1) to maintain and aid restoration of the composition, structure, and function of aquatic, riparian, and associated wetland systems"; and "(3) to maintain and aid restoration of water to the quantity, quality, and timing with which these systems evolved." (HCP, IV.137)* • Current mapping of forested wetlands is inaccurate. Therefore, there may be inadequate protection of forested wetlands until mapping and typing is implemented. In particular, fish use of stream-accessible forested wetlands should be evaluated and correctly mapped.
Marbled Murrelet	PROTECT MARBLED MURRELET HABITAT • *"Commitments to the conservation of marbled murrelets will be also incorporated into landscape plans." (HCP, IV.91)* • DNR's Interim Management policy in the OESF is to retain all MM habitat which has been reclassified until the Long Term Management Plan is adopted. Conservation Caucus supports this. • The Conservation Caucus supports these recommendations: o "In the Olympic Experimental State Forest (OESF), recommended conservation emphasis differs among the 11 landscape planning units (LPUs). The greatest emphasis on conservation is placed in the Dickodochtedor, Goodman Creek, and Kalaloch LPUs, where 39,000 acres are delineated into MMMAs that will be managed to achieve and maintain at least 50 percent of those areas as high-quality nesting habitat. In the other eight LPUs, varying conservation emphases are recommended based on specific landscape configuration, forest conditions, and other management considerations in those individual landscapes. o "The Science Team also recommends that all designated "old forest" in the OESF, about 44,000 acres, be deferred from harvest for the duration of the HCP in support of nesting habitat for the marbled murrelet." (Recommendations and Supporting Analysis of Conservation Opportunities for the Marbled Murrelet Long-Term Conservation Strategy, Summary of Recommendations, p. A,B) • The Landscape Plan must provide at least the protection provided in the Long Term Marbled Murrelet Plan when it is adopted. • Compare MM habitat with Mass Wasting, Landslide Hazard Zonation, and Landslide Inventories. Increase the acres of MM habitat outside of unstable areas in order to provide better certainty of habitat continuity. (Conservation Caucus)
Northern Spotted Owl	• *"The strategy is to be implemented in two phases, one of habitat restoration followed by one of maintaining and enhancing a mosaic of habitats that shifts over time as guided by analyses and plans for individual landscape planning units." (HCP, IV.87)* • *"Management for desired owl habitat conditions will be planned and implemented at the scale of landscape planning units." (HCP, IV.87)* • *"…in the OESF by managing each landscape planning unit to maintain or restore threshold*

	proportions of potential habitat. Those proportions are: *(1) "at least 20 percent of DNR-managed lands in the landscape planning unit in the understory-reinitiation to old-growth stages that are potential old-forest habitat; and* *(2) "at least 40 percent …that are potential old-forest, sub-mature, or young-forest marginal spotted owl habitat types, including any old-forest habitat described in (1)." (HCP, IV.88)* *(3) "The currently proposed threshold proportions of potential spotted owl habitat are not intended to be targets for management; rather, they are minimum standards that reflect that reflect the current understanding on forest-ecosystem processes." (HCP, IV.88)* • *"Table IV.12 shows the number of acres and percent of land base in each buffer category, by forest age class, out of 264,000 total acres of DNR-managed land in the OESF. Approximately 35 percent of the total acres, therefore, will contribute to maintaining and restoring riparian functions and processes. These acres will provide more than 50 percent of the proposed habitat for northern spotted owls and a significant percentage of habitat for marbled murrelets." (HCP, IV. 134)*
Salvage	• No salvage in old-growth, old-forest, structural, marbled murrelet, or riparian habitat, unless guided by a site-specific plan, to return the stands to a biologically and structurally diverse condition, replenishing any old or new deficiencies in snags, large diameter downed wood, and legacy trees. • The plan must have effectiveness and validation monitoring that informs future enhancement or harvest activities in each stand, based on research-based metrics that come from reference stands..
Clean Water Act	• "Aquatic life uses are designated based on the presence of, or the intent to provide protection for, the key uses identified below in (a). It is required that all indigenous fish and nonfish aquatic species be protected in waters of the state in addition to the key species described below. (WAC 173-201A-200(1) (emphasis added). This language was approved by EPA *via* a February 8, 2008 letter to Ecology; also see definition of Aquatic Uses in State Clean Water Act) • The Forest Practices Board requires that "[p]promulgation of all forest practices rules shall be accomplished so that compliance with such forest practices rules will achieve compliance with the water quality laws." WAC 222-12-010. • The OESF Landscape Plan must provide for compliance with the State Clean Water Act, and includes both water quality standards and anti-degradation which protects all aquatic life under Tier 1.
Production and Revenue	• Allow the flexibility to develop revenue-generating recreation developments and other non-timber opportunities, which do not damage public resources or the conservation objectives of the OESF, but only after a full public review and hearings under the State Environmental Policy Act. (Conservation Caucus) • Allow financially infeasible timber management activities, i.e. pre-commercial thinning, and limited number of below-cost sales to achieve habitat improvements, or to restore habitat damaged by previous timber management. • Develop a program to value ecosystem services in the OESF, in anticipation of revenue and credits given to carbon sequestration, clean water, flood storage, fish and wildlife production, and non-timber forest products. Incorporate and balance these values in timber sale assessments. (Conservation Caucus)
Even Flow	"The department will express the sustainable harvest level for a given unit as mean annual timber volume for a planning decade. In Western Washington, the sustainable harvest units are as follows: The Olympic Experimental State Forest, regardless of trust." (Policy Sustainable Forestry, p. 29)
HCP, Sustainable Harvest Level, , Settlement Agreement	MAKING CHANGES: • The HCP can only be modified through the Major Amendment provision of the Implementation Agreement. The Sustainable Harvest Level for the OESF can only be amended by action of the Board of Natural Resources, presumably because of the results of the Planning process. The Settlement Agreement can only be changed with the agreement of all parties. (Conservation Caucus interpretation.) • If the sustainable harvest calculated for the OESF under this Landscape Plan deviates from that of the Sustainable Harvest Calculation, the DNR shall recommend to the Board of Natural Resources, that a new calculation be made, reflecting the sustainable harvest under the OESF Landscape Plan. • A sustainable harvest level that *"…will ensure a range of forest types in adequate amounts to provide for multi-species conservation across the landscape…. Table IV.14: DNR HCP stand structure objectives at year 100 (in percentage of land area) OESF Planning Unit." [HCP, IV. 179-80]*. This is a firm requirement, not an aspirational goal. • *"Harvest calculations are based upon typical silvicultural regimes, estimated to achieve the habitat objectives described in the conservation strategies as well as to increase the commercial productivity of DNR-managed lands in the area covered by the HCP." (HCP, IV.191)*

	• *"Table IV.15: Estimated amount of forest land management activities on DNR-managed lands in the area covered by the HCP during the first decade of the HCP." (HCP, IV. 211)*

PART II: Technical Comment Papers:

A. **Adaptive Management - Toby Thaler**
B. **TS Analysis of current management – Golde & Golde**
C. **Riparian Assessment Procedures**
    1. **Water Quality and Riparian Assessment - Mark Hersh**
    2. **Mass Wasting, Stream Channels and Soils Surface Erosion – Dave Montgomery**
    3. **Sediment, Riparian Assessments, – Mike Haggarty**
    4. **Fish Habitat - Bull Trout - Shelley Spalding**
    5. **Riparian Function – LWD - Shelley Spalding**
    6. **Fish Habitat – Headwater Streams & Stream Typing – Chris Mendoza**
    7. **Northern Spotted Owl – Dave Werntz**
    8. **Marbled Murrelets – Kara Whitacker, Herb Curl**
D. **Sustainable Harvest Levels; Forest Conditions in 100 years Levels of Disturbance - Miguel Perez Gibson, WEC**
E. **General Comments**
    1. **Marcy Golde**
    2. **Coleman Byrnes**

REVIEW OF ADAPTIVE MANAGEMENT ANALYSIS AND PROVISIONS

Toby Thaler

I. Context—Adaptive Management Under the 1997 Habitat Conservation Plan

A fundamental premise of DNR's 1997 HCP is that adaptive management will be used to inform timber management on state trust lands. This is particularly the case with respect to the separately treated Olympic Experimental State Forest (OESF). For example, "management approaches [to riparian conservation for the OESF] will be adaptive, to incorporate new insights obtained from experiments and other sources into effective management strategies." (HCP, p. IV-107).

The HCP explicitly recognized that in some circumstances timber harvest levels would need to be "minimized and mitigated" in order to "achieve the habitat goals" of the HCP. (HCP, p. IV-191). That page contains the only reference in the HCP to DNR's state-law driven establishment of timber harvest levels. For at least the next seventy years, DNR's timber harvest levels are required to be "based on the HCP conservation strategies." (Id.; HCP Implementation Agreement (IA) § 19.1.)

The IA expressly contemplates "modifications to existing management practices" (i.e., changes in allowed timber harvest levels) in response to information developed under the HCP's monitoring and adaptive management provisions. In short, adaptive management is "modifications of management practices to respond to new information and scientific developments." (HCP IA, § 24.5.)

In a number specific areas, DNR's obligations to reduce the amount of timber harvested from state forest lands, and potential economic impacts, are not subject to the limitations of the "unforeseen" or "extraordinary" circumstances clauses of the HCP. (IA, §§ 23 and 24). In other words, as adaptive management results in improved knowledge concerning what prescriptive measures are needed to meet habitat conservation goals, "additional financial commitments … or land use restrictions" on DNR are not limited. (IA § 24.3.)

DNR's resource conservation obligations under the HCP's adaptive management provisions include:

1. an increase in the percentage of ground cover of dead and down wood is required for the support of the Northern Spotted Owl in the definition of sub-mature habitat (limited to 15 percent ground cover averaged over a stand);
2. improvements to the site-specific mass wasting model;
3. Marbled Murrelet habitat definitions refinement for each planning unit;
4. Marbled Murrelet interim conservation strategy will be replaced with a long-term management plan upon completion of the inventory survey phase;
5. refinement of management activities within the riparian management zones within the first decade; and
6. a long-term conservation strategy for forest management along Type 5 Waters will be developed and incorporated into the HCP at the end of the first ten years of the HCP.

(IA § 24.5.) "Management practices shall be implemented by DNR as reasonably necessary" to implement the listed adaptive management items. Id.

One expert on adaptive management at the landscape (cited in the DEIS) has written:

> [E]ffective adaptive management involves three elements: (1) producing new understanding, based on systematic assessment of feedback from management actions; (2) incorporating that knowledge into subsequent actions; and (3) creating venues in which understanding can be communicated.

(Adaptive Management and the Northwest Forest Plan, Stankey, et al., 101 Journal of Forestry 40 at 41 (2003)).

Regarding the first element, the HCP recognizes the intimate interrelationship between monitoring and adaptive management: "The monitoring and research provisions of the HCP are in part designed to identify modifications to existing management practices." (IA, § 24.3.) Monitoring on the OESF is expressly intended to lead to "use of results in management decisions." (HCP p. IV-83). The OESF DEIS appears to discuss the need to have a scientifically valid monitoring. Appendix B,, pp. 12, et seq. However, no reference is made to the scientific literature spelling out exactly how this goal is to be achieved. E.g., Monitoring Guidelines to Evaluate Effects of Forestry Activities on Streams in the Pacific Northwest and Alaska, MacDonald et al. (1991); Putting Monitoring First: Designing Accountable Ecosystem Restoration and Management Plans, Ralph and Poole, Ch. 9 in Restoration of Puget Sound Rivers, Montgomery, Ed. (2003).

The above content of adaptive management is consistent with the federal services' requirements for HCPs. The handbook they use to guide HCPs lists:

> the key components that make an adaptive process in HCPs meaningful… include careful planning through identification of uncertainty, incorporating a range of alternatives, implementing a sufficient monitoring program to determine success of the alternatives, and a feedback loop from the results of the monitoring program that allows for change in the management strategies.

(65 Fed. Reg. 35245 (June 1, 2000) (Final Addendum to the Handbook for Habitat Conservation Planning and Incidental Take Permitting Process)).

The U.S. Department of the Interior's technical guidance for use of adaptive management contains similar language:

> An adaptive approach involves exploring alternative ways to meet management objectives, predicting the outcomes of alternatives based on the current state of knowledge, implementing

> one or more of these alternatives, monitoring to learn about the impacts of management actions, and then using the results to update knowledge and adjust management actions.

(Adaptive Management: The U.S. Department of the Interior Technical Guide (2009) (Available at http://www.doi.gov/initiatives/AdaptiveManagement/index.html)).

II. Treatment of Adaptive Management in the OESF DEIS

Notwithstanding references in the OESF DEIS to studies concluding that adaptive management of forest land at the landscape scale has largely been a failure, the DEIS fails to list the specific uncertainties to be addressed in the adaptive management of the OESF. Of particular concern are ESA listed species and their habitat, and water quality. DNR has conducted many such studies in the thirteen years since entering into the HCP, yet almost none are cited in the adaptive management discussion. For example, reference is made to two 2001 monitoring plans, but "neither has been finalized, officially adopted or implemented in full by the department." This leaves the process open ended and ill-defined.

Most importantly, regarding the second element noted by Stankey, quoted above, the OESF DEIS fails to identify a mechanism to ensure that management practices will be changed "as reasonably necessary." As DNR's Adaptive Management Program Manager notes with reference to DNR's Forest Practices HCP, with a similar if not more 'robust' adaptive management provision, a major failure of adaptive management is the lack of specification of "the ranges within which rules can change." (DEIS, App. B, p. 7.)

The DEIS does reference "decisions for Adaptive management changes" and includes "changes in land management practices" in the list of "DNR decisions" that may result from adaptive management. (DEIS, App. B, p. 17; Fig. B-2). However, no specifics are listed or discussed, no time tables are set out, and no benchmarks are established to trigger review of management practices. There is no 'closing of the loop.' In terms of Stankey's third element, no "venue is created in which understanding can be communicated" let alone a mechanism to ensure that management changes will actually occur. Since the single most important land management decision on the OESF is the location and quantity of timber harvesting, to close the loop of adaptive management the OESF Plan EIS must establish and evaluate a process and schedule needed to obtain any "necessary changes" in the sustainable harvest level from the Board of Natural Resources.

The implications of the DEIS's incomplete discussion and evaluation of future adaptive management on the OESF is clear: it is not likely to occur. It has been thirteen and a half years since the HCP IA was executed, and few if any of the required adaptive management measures listed in § 24.5 have resulted in changes in land management practices. Without a change in DNR's proposed adaptive management implementation process, this lack of change in management on the OESF in response to monitoring results is highly likely to continue. The consequential adverse environmental impacts of that failure need to be included in the EIS.

The most obvious failures of adaptive management on the OESF are the lack of implementation of the required long-term Marbled Murrelet conservation strategy, and the absence of specific management changes in response to ongoing water quality impacts from forest practices.

A valid DEIS will include an evaluation of the impacts on both timber and non-timber resources of the likely failure of the adaptive management process being carried forward, together with an alternative that fixes the problems with the current process.

OLYMPIC EXPERIMENTAL STATE FOREST (OESF) MANAGEMENT UNDER THE DNR HABITAT CONSERVATION PLAN (HCP)

An Analysis of 87 Timber Sales in the OESF
Between November, 2004 and June 30, 2010

Marcy Golde and Hellmut Golde

The following issues emerged from a database analysis of 87 sales from November, 2004 to the present, as approved in final SEPA and Forest Practices documents. OFCO is focusing on three issues.

1. Roads
2. Inadequate Riparian buffers
3. FPA and HCP Compliance Monitoring (Jan. 1, 2007 to Oct. 15, 2008)

1. ROADS

Background:

The Forest Practices HCP requires that each owner supply Road Maintenance and Abandonment Plans (RMAPs). This process does not cover road density issues as required in HCP items 5 and 6 on roads (HCP, IV.118). Nevertheless the DNR has found the RMAPs process fully compliant with the HCP.

OFCO'S Position:

OFCO disagrees with DNR based on data showing 52.37 miles of permanent and temporary road construction and reconstruction, but the publically recorded closure of 15.16 miles, both permanent and temporary roads as shown on the FP Applications. This information probably does not include decommissioning roads, but may; the information is just totally unclear on the status of decommissioned roads.

DNR HCP on Roads

"Comprehensive Road-Maintenance Plans. The objectives …are to:

(5) guarantee that additional new roads are built only where no other operationally or economically viable option exists for accessing management areas by existing roads or alternative harvest methods (e.g., full-suspension yarding);

(6) minimize active road density;

"No absolute threshold exists for acceptable road densities within drainage basins…Cederholm and Reid (1987) reported that 2.5 miles per square mile or less constitutes the optimum number of miles for the Clearwater River basin."

"The riparian conservation strategy seeks to use landscape-planning tools to analyze the projected needs for roads over the long term (i.e., greater than 100 years) and use this information ***to minimize the total road density within each watershed****.* (HCP, IV. 118-9)

Current Management:

- Road maintenance was planned for 129.65 miles (684,548 ft.) of road in conjunction with DNR timber sales in the OESF, since 11/1/2004.
- Publically recorded road closings included 15.16 miles. (80,070 ft) of abandoned or decommissioned roads.
- Many WAUs exceed the Cedarholm, Reid optimum of 2.5 miles per square mile in the Clearwater River Basin. In many of these WAUs new roads are being constructed.

WAU	**Miles of road/sq. mi. 2005**	**Miles of road/sq. mi. most recent**	**Total Construction +Reconstruction**	**Feet of Abandonment & Decommissioning**
W.F.Dickey	4.7	5.2	unknown	unknown
Sol Duc, Upper	2	4.0	unknown	unknown
Sekiu	5.0	5.9	unknown	unknown
Ozette Lake	3.9	4.6	unknown	unknown
Middle Hoh	3.5	4.2	unknown	unknown
Kalalach	4.0	4.2	unknown	unknown
Hoko	4.4	5.7	unknown	unknown
Hoh, Lower	3.1	5.0	unknown	unknown
E.F. Dickey	4.1	5.1	unknown	unknown
Clearwater, Lower,	4.5	4.5	unknown	unknown
Clallam River,	2.5	4.6	unknown	unknown
TOTAL Roading (new& reconstruction) in OESF since 10/2004			**52.37 mi. (276,533 ft.)**	**15.16 mi. (80,070 ft.)**

Decommissioned vs. Abandoned Roads

- Decommissioning and abandoning a section of road are not the same thing. Abandonment offers significantly more protection to Public Resources than does decommissioning, which usually leaves culverts in place, and at least some fill.
- Abandonment of roads is a legally enforceable process that must follow the Forest Practices Act Rules and must be approved by the DNR FP Division. Decommissioning is a process used on the DNR-managed lands. It is non-regulatory and cannot be enforced in the same way as formally abandoned roads.
- In all probability there are many more miles road which have been decommissed, but not recorded on the SEPA documents. They would not be shown on the Forest Practices Application.

DEIS on OESF Landscape Plan

- The DEIS for the Landscape Plan in the OESF does not include any discussion or information on the estimated amount of new and reconstructed roads needed for any time period, as indicated in the DNR HCP (IV.119). It also fails to consider the miles of road per square mile. It only notes that the cost of repair may be high, due to the age of the road system.(DEIS, 63-4)

- The DEIS indicates that OESF roads will be brought up to the standard of the Forest Practices Act, but not a higher standard for State Lands including points 5 and 6 of the HCP. (DEIS, 63)

2. INADEQUATE RIPARIAN BUFFERS

OFCO's Position:

- Interior-Core Buffers - HCP
    - Use HCP Table IV.5. Interior Core Buffer, (HCP,IV.58).
    - The interior-core buffers widths, as described in the HCP, were intended to provide full protection to a range of key watershed parameters Table IV.10 [HCP, IV.123]
    - The purpose is to protect all aquatic functions; therefore, it is very seldom appropriate to have no buffers just because the land is stable.
    - 25' no harvest on all T 1-4 streams (Bull Trout B.O. p. 51), DNR and Services have agreed that this minimum buffer in not required.
    - Interior Buffer widths on all T 1-4 streams must meet the averages in HCP Table IV.5, calculated by sale for all types of harvest (regeneration or variable retention harvest which always has exactly 8 trees per acre remaining, thinning, salvage).
    - The buffers on a thinning need to be distinguishable and qualitatively different from uplands, because of their different purposes and the multiple protections they provide, temperature regulation, large and small woody debris, bank stability, nutrients. In addition the DNR HCP assumed 50% of Spotted Owl habitat and large portion of Marbled Murrelet habitat in short and long term would come from the riparian zone (IV.106).
    - All T 3,4&5 streams must have their stream typing checked in the field before laying out any timber sale, using the 2 foot break definition.
    - All protections also need to be documented and shown as buffers in the SEPA review and the FPA as the HCP anticipated (HCP,IV.111), not simply excluded as "bounded out" or "non-

operable". This documentation would provide for ease of internal and external tracking and monitoring and external transparency.
    - Headwaters need to be buffered as shown in HCP (IV.119)

- Exterior (Wind) Buffers - HCP
    - Documentation of wind firmness needs to be based on more than the memory of the local forester, or her experience with thinning that has not been subject to formal review, or from non-peer reviewed modelling. Wind buffers are a firm requirement of the HCP, not a local forester option.
    - Remove no more than 33% of volume per rotation.
    - Exterior (wind) buffers must be documented on FPA, and SEPA.
    - Wind buffers will meet the average sizes in the HCP Table IV.8, calculated by sale(IV.117).

HCP on Buffers:

- The Interior Core buffers as described in the HCP were intended to provide full protection to a range of key watershed parameters Table IV.10 [HCP, IV.123].
- "Interior-core buffer widths for each stream type of the OESF are greater than or approximately equal to …70 to 90 percent of the site potential tree height for a 120-year growth cycle."[IV.124]
- "…wind buffers will be placed on all riparian segments for which stand wind-firmness cannot be documented…." (IV.117)

HCP Buffers (in feet) in clearcut harvest units

Buffers	**T1**	**T2**	**T3**	**T4**	**T5**
Ave. Interior Core	150	150	100	100	As needed
Ave. Exterior (Wind)	150	150	150	50	50
TOTAL	**300**	**300**	**250**	**150**	

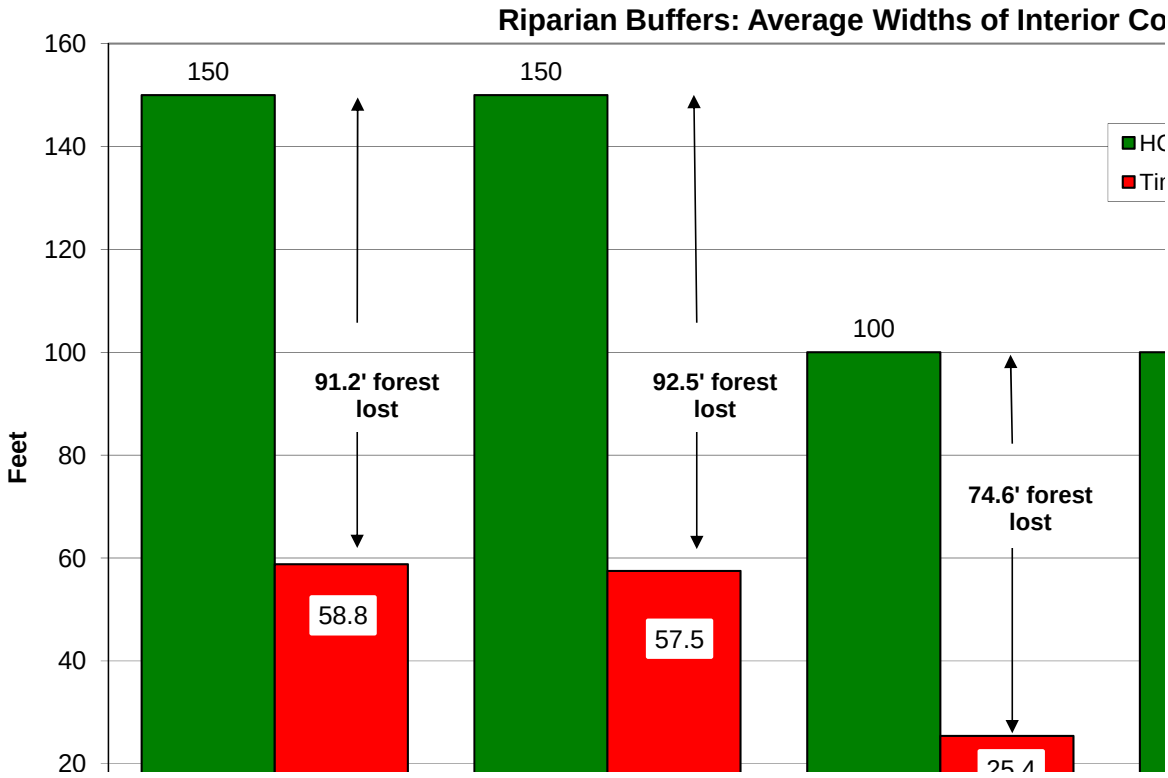
(HCP Tables IV.5, 8)

Data Base Information:

The SEPA and FPA data does not always differentiate the Interior and Exterior (Wind) buffers. Where it is available I have included this information.

Actual Timber Sale Buffers (in feet) on clearcut units

Buffers	T1	T2	T3	T4
Ave. Interior Core	58.8	57.5	25.4	19.9
Ave. Exterior (Wind)	150.0	142.5	145.8	54.3
Average TOTAL	**205.8**	**200**	**164.4**	**78.1**



Data from SEPA and FPA documents

The main difference is in the average Interior Core Buffers. The HCP intends the Interior buffer to protect ALL the aquatic needs; the DNR designs it to protect only unstable slopes.

CURRENT MANAGEMENT:

- Historical Explanation: The total riparian zone is approximately the same width as the one used in the OESF just before the HCP was written in 1997. Those widths are the source of the Interior Core Buffer widths; see Table IV.5 on page IV.58 in the HCP. The HCP for the OESF added a wind buffer to protect the riparian zone (HCP, IV.117). However, it was not actually applied until after the HCP Compliance Review was released in 2005, describing it as required, but missing. As there were no successful timber sales in the OESF in FY 2006, the first Exterior Wind buffers were described in FY 2007. However, the total width of the riparian zone remained unchanged, it was now relabeled with a narrow Interior Core averaging around 25 feet and going as low as 0 in some places, still with an Exterior (Wind) Buffer of 150'. The logic of a 150' wind buffer to protect a 10' riparian zone has never been adequately explained. Basically the width of the buffers was not changed, but the nomenclature was modified to appear to comply with the HCP.
- Although the data, because of the use of averages, obscures the range of actual riparian buffer widths from 0 feet to 87.3 feet on a Type 3 fish stream for clearcut harvest units, it is clear that there is a dramatic discrepancy between the Average Interior Buffer widths in the HCP and the widths of buffers in actual timber sales, as depicted below. Three sales had interior buffers of 0 to 15 feet, thus averaging 7.5 feet. See data report on Roads in Attachments.
- These buffers, while dramatically narrower, are all No Harvest buffers on sales where the upland harvest is a clearcut. On sales where the upland harvest is a thinning of any type, there are no added leave trees in the so-called buffer; the harvest prescription extends either the last row of trees or to water's edge.

Intensity of harvest

- Riparian thinnings depend on the thinning density of the Uplands, as that harvest is extended to the final row of trees bordering the streams, or to water's edge.
- When the Uplands are clearcut, always leaving only the require 8 trees per acre, then the Inner and Outer Zones are currently left unharvested.

DEIS on OESF Landscape Plan:

The definition of Interior Zone width is 75', but there is no indication of the intensity of harvest within a buffer; it could be repeated several times during a rotation contrary to the HCP (IV.117), and include clearcutting, to water's edge.

3. TYPE 5 WATERS July 1, 2004 to June 30, 2007

TYPE 5 HEADWATER STREAMS
RIPARIAN BUFFERS ON CLEARCUT HARVESTS IN THE OESF
July 1, 2004 to June 30, 2007

•Data on T5 waters was limited and of poor quality. For example Lambasted, Unit 2 states: Unit 2 has six T5 waters. "Type 5 streams have been protected with varying width interior core buffers and 50' wind buffers where unstable. Stable Type 5 streams have been protected with green tree retention."

•Only TOTAL buffer widths have validity; there is too little information on inner-core and external buffers.

•The width of many T5 stream buffers with defined RMZs is substantially less than those provided for in the HCP, and they are apparently without exterior buffers.

•The proportion of streams with any defined buffers on T5 streams is a small fraction, about one third, of the proportion stated in the HCP. HCP calls for 95% of all T5 streams to have buffers, and the checklists called for 32.8%.

HCP on Type 5 Waters

Maximum Defined Average Inner-Core Buffers	Defined Average Exterior Buffers	Maximum Defined Average TOTAL Buffers
0 to 500+'	**50'**	**0 to 550**

HCP, Table IV.10. It seems clear from the HCP and BOs that the average was to be applied to each sale.

Largest Defined Average Total Buffers

Snahappe, Unit 6*	65'
Tyee Returns	50'

*Snahappe, Unit 6, 33% thinning harvest of 50' Exterior Buffer

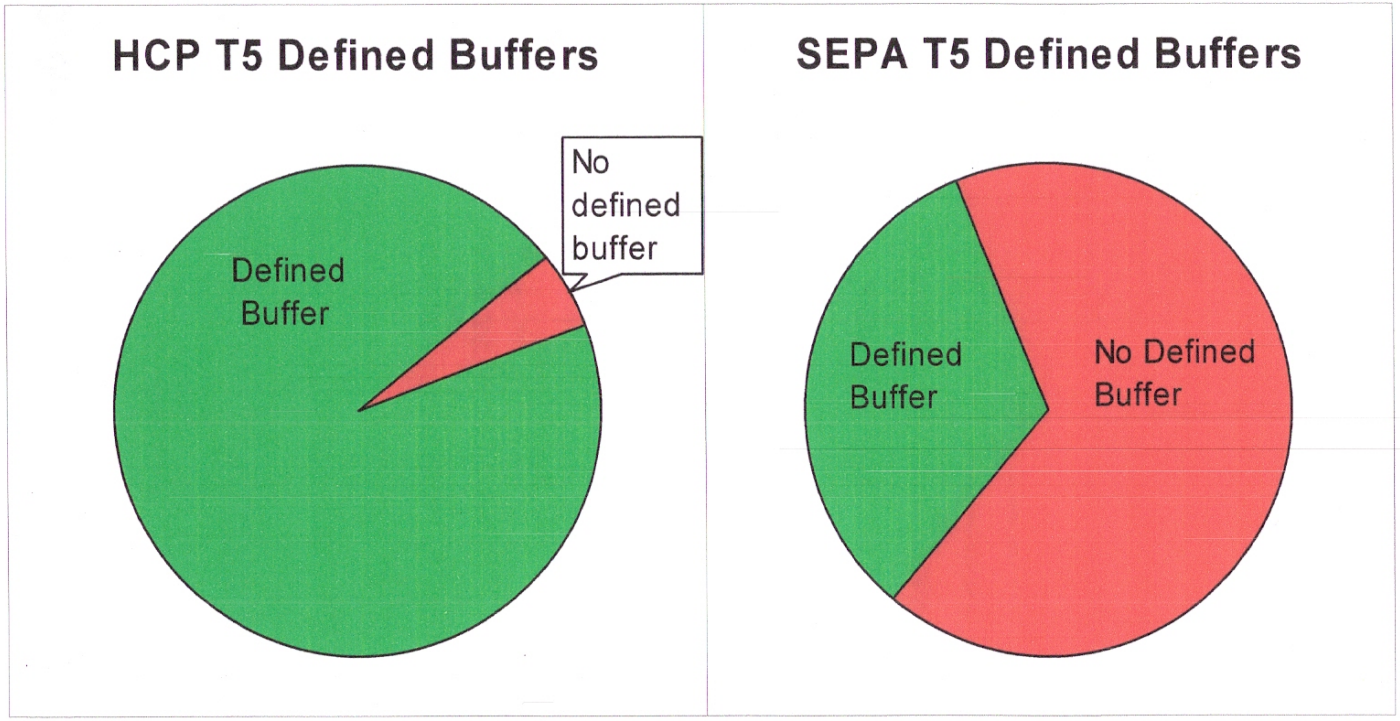
Smallest Defined Average Total Buffers

D-2000 Clean-up	12.5' (10'-15')
Sekiu, Unit 1	20' (10'-30')
Shuwah Jigsaw; Minnow; Kugel Alder	22.5' (20'-25')

Number of Type 5 Streams Protected with Buffers

•HCP states that **95%** of all Type 5 streams met criteria for Inner-core buffers regardless of the type of upland harvest.

•SEPA checklists shows a total of 47 T5 streams with <u>defined</u> buffers, and a total 143 T5 streams in those same clearcut sales. That is only **32.8%** of Type 5 waters which received <u>defined</u> riparian buffers from 12.5 to 70 feet on clearcut units. Other streams were included in undefined unstable protection zones, or had clumps of trees left near them.



4a. FPA COMPLIANCE Jan. 1, 2007 to Oct. 15, 2008

A rigorous, unbiased enforcement of the FPA terms and Rules is vital, in fact indispensable, to the successful implementation of any HCP. This summary of the DNR data raises doubts about the adequacy of compliance and of enforcement.

OFCO's Position:

- Because some parts of OESF policy and management defer to WA Forest Practices Regulations, a rigorous, unbiased enforcement of the FPA Rules is vital, in fact indispensable, to the successful implementation of the DNR HCP. Roads and protection of unstable slopes are only judged by Forest Practices standards.
- Because much of the OESF is interspersed with private forest lands, protection of water quality on private lands is also important to the ecological health of streams on State managed lands. Therefore, vigorous enforcement of Forest Practices on private as well as State lands, needs to prevent problems such as sediment loaded waters flowing into all Waters of the State.
- OFCO expects that actions causing impacts or potential impacts to all Waters of the State, including wetlands and Type 5 waters, will be cause for the issuance of a Stop Work Order, not just a Notice to Comply.
- Informal Conferences should be recorded in such a way that they can receive public review. The current practice of placing the notes only in the individual FPA makes both public review or management oversight impossible.
- The percentage of violations compared to the number of FPA should show a reasonably consistent level of enforcement across DNR Regions.

FPA Compliance:

- A review of the Stop Work Orders and the Notices to Comply showed significantly different levels of enforcement with the Northwest Region have 10% of their FPAs having violations, compared with 1% in the Pacific Cascade Region.
- Another problem was exposed through a detailed review of each violation in the Olympic Region. It showed many violations or potential violations causing sedimentation of flowing waters, but many of those received only Notices to Comply, several with extended dates for compliance. (See Appendix A.)
- 11,167 FPAs were issued by DNR in 2007- 8. Compliance Actions taken by DNR from Jan. 1, 2007 to Oct. 15, 2008:
    - Civil Penalties: 6 (0.05% of FPAs) See attached sheet
    - Stop Work Orders (SWO): 115 (1.03% of FPAs)
    - Notice to Comply (NTC): 235 (2.1% of FPAs)
    - Informal Conferences – no summary records available

4b. COMPLIANCE BY DNR REGION

Region	Total FPAs	No. SWO + NTC	Percentage
NE	1,914	91	4.75%
NW	1,027	110	10.07%
OLY	1,570	26	1.65%
PC	4,555	46	1.00%
SE	619	26	4.2%
SPS	1l482	46	6.32%
TOTALS	**11,167**	**350**	**3.13%**

- An analysis of the NTC and SWO for the Olympic Region showed repeated instances of problematic practices and lack of vigorous enforcement:
  - In both the OLY and PC Regions no damages were assessed in any compliance action.
  - Many instances of sediment into typed waters were not classified as Immediate Action, nor Stop Work Order.
- See Attachments for an analysis of Olympic Region compliance actions.

HCP Compliance Monitoring

OFCO's Position:

Compliance Monitoring of the HCP is a vital function. It must be based on measurable, numeric standards and conducted on a regular basis.

DNR Compliance Monitoring Reports:

- DNR performed compliance monitoring of various aspects of the HCP. However, no compliance monitoring has been conducted since 2007, due to budget constraints.
- The compliance report on riparian protection in 2004 used both Table IV.5 and 8 and reported a total lack of Exterior Wind buffers. This agrees with the statement in the 2007 review, that "*When the HCP was first implemented, OESF managers typically applied a single multipurpose buffer to streams* (Christiansen and Vaughn pers. Comm..2008)" (HCP for State Lands, 2007 Implementation Monitoring Report, July, 2008, p. 7)
- The review of riparian buffers in 2007 for the OESF encountered a significant problem. It was not possible to determine compliance with the HCP, as the DNR's interpretation of OESF Interior Core buffers is now based on a site specific judgment by the field forester of whether there are unstable slopes present, and has no numeric or other measurable standards. Therefore the Compliance Monitoring looked only at contract compliance, not HCP compliance..

Supplemental Material:

Roads Data Sheet
T1, T2, T3, T4 Riparian Data Sheets
OESF Compliance Analysis Sheet

Roads by Date of SEPA Approval

From 11/1/2004 ***To*** 6/30/2010

New Construction	91,583	***feet***	=	17.35	***miles***
Optional New Construction	38,330	***feet***	=	7.26	***miles***
Total New Construction	129,913	***feet***	=	24.60	***miles***
Reconstruction	106,466	***feet***	=	20.16	***miles***
Optional Reconstruction	40,154	***feet***	=	7.60	***miles***
Total Reconstruction	146,620	***feet***	=	27.77	***miles***
Total Permitted Roads	276,533	***feet***	=	52.37	***miles***
Required Maintenance	629,038	***feet***	=	119.14	***miles***
Optional Maintenance	55,510	***feet***	=	10.51	***miles***
Total Maintenance	684,548	***feet***	=	129.65	***miles***
Abandoned Roads	42,357	***feet***	=	8.02	***miles***
Decommissioned Roads	37,713	***feet***	=	7.14	***miles***
Total Closed Roads	80,070	***feet***	=	15.16	***miles***
Ratio of Permitted to Closed Roads:	3.45 to 1				
Number of Culverts (fish barrier)	24				
Number of Culverts (non-fish barrier)	874				
Total Number of Culverts	898				
Number of bridges	7				
Number of In-stream Restoration Sites	5				

T1 Riparian Buffers with Clearcut Sales

From 11/1/2004 until 6/30/2010

TOTAL number of sales or units with T1 streams	7				
Number of sales or units listing total buffers	6				
Average T1 total buffer width on ALL sales or units	205.8	feet			
Number of sales or units listing interior buffers	4				
Average T1 Interior-core buffer	58.8	feet			
Maximum of average interior buffer for the T1 stream type	87.5	feet	Minimum	22.5	feet
Number of sales or units listing exterior buffers	4				
Average T1 Exterior-core buffer width	150.0	feet			
Maximum of average exterior buffer for the T1 stream type	150.0	feet	Minimum	150.0	feet

Note:

If ranges of buffer widths are given in an application, averages are used. For example, if a range of 20 to 50 feet is given, 35 feet is used for this report.

Clearcut Timber Sales

Landing Strip

Old Mill

PBS

Middle Drift

Happe Max

Scotch

This Old House

Boulder

West Coast

Fresh Start

Good 2V

Basin 365

Rainey Daze

Berry Bucket

Hey Louie

Octopus Tales

Stripes

Section 16

Bear Mill Divide

No Oil

Carpenter

Buck Run

Horse Feathers

Still No Legs

Lightening Fast

Raine Drop

Blowder Ridge

Clark Grade

Fiber Board Flats

High 'n Dry

Old Goat

Mainsail

Skipped Timber Sales

Reade My Lips Thinning

P-1600 Blow Down

Cop 23 Thinning

Cassel School TS (thin)

Duc Valley Blowdown

Broken Shale Blow Down

Diddy Dop BD

Park Access Blow

Big Trout BD

Anderson Pole

Bus Boy 2 Blowdown

T2 Riparian Buffers with Clearcut Sales

From 11/1/2004 until 6/30/2010

TOTAL number of sales or units with T2 streams	4				
Number of sales or units listing total buffers	4				
Average T2 total buffer width on ALL sales or units	200.0	feet			
Number of sales or units listing interior buffers	2				
Average T2 Interior-core buffer	57.5	feet			
Maximum of average interior buffer for the T2 stream type	100.0	feet	Minimum	15.0	feet
Number of sales or units listing exterior buffers	2				
Average T2 Exterior-core buffer width	142.5	feet			
Maximum of average exterior buffer for the T2 stream type	150.0	feet	Minimum	135.0	feet

Note:

If ranges of buffer widths are given in an application, averages are used. For example, if a range of 20 to 50 feet is given, 35 feet is used for this report.

T3 Riparian Buffers with Clearcut Sale

From 11/1/2004 until 6/30/2010

TOTAL number of sales or units with T3 streams	60				
Number of sales or units listing total buffers	57				
Average T3 total buffer width on ALL sales or units	164.4	feet			
Number of sales or units listing interior buffers	51				
Average T3 Interior-core buffer	25.4	feet			
Maximum of average interior buffer for the T3 stream type	87.0	feet	Minimum	0.0	feet
Number of sales or units listing exterior buffers	51				
Average T3 Exterior-core buffer width	145.8	feet			
Maximum of average exterior buffer for the T3 stream type	150.0	feet	Minimum	0.0	feet

Note:

If ranges of buffer widths are given in an application, averages are used. For example, if a range of 20 to 50 feet is given, 35 feet is used for this report.

T4 Riparian Buffers with Clearcut Sale

From 11/1/2004 until 6/30/2010

TOTAL number of sales or units with T4 streams	52				
Number of sales or units listing total buffers	50				
Average T4 total buffer width on ALL sales or units	78.1	feet			
Number of sales or units listing interior buffers	43				
Average T4 Interior-core buffer	19.9	feet			
Maximum of average interior buffer for the T4 stream type	70.0	feet	Minimum	0.0	feet
Number of sales or units listing exterior buffers	43				
Average T4 Exterior-core buffer width	54.3	feet			
Maximum of average exterior buffer for the T4 stream type	150.0	feet	Minimum	20.0	feet

Note:

If ranges of buffer widths are given in an application, averages are used. For example, if a range of 20 to 50 feet is given, 35 feet is used for this report.

FPA	Year	Region	County	Landowner Last Name	Landowner Company	NTC reason	SWO reason	ISSUES	POTENTIAL MATERIAL DAMAGE - Marcy	LOCATION		DON'T OPERATE
2605495	2008	OLY	05 Clallam		Olympic tree farm llc.	violation		"Timber haul on the ORTF Road #301 caused delivery of sediment laden water to Jansen Creek. The ORTF Road #301 is not built to a standard to support wet wheather timber haul. The landowner has shut doen all timber haul."	Yes	NE 1/4, S35, T33; R14W	OESF	4 1/2 months to fix.
2607614	2007	OLY	05 Clallam		Rayonier FOREST RESOURCES	deviation; violation		"Cut a total of (15) floor zone trees associated with stream #1a that were required to remain standing under DFC option #2.	?	S4;T28N;R14W	OESF	
2607649	2007	OLY	14 Grays Harbor	Griffiths	Craig & Rod Griffiths	deviation; violation		"Harvesting timber in an RMZ-Core, inner & outer while constructing new R/W not identified on FPA." Self-reported.	Yes	N 1/2, S1/4&NE 1/4, SW 1/4, S8;T 20; R12W		Haul not allowed until acceptable road repair plan approved.
2607723	2007	OLY	05 Clallam		Olympic range tree farm	immediate action (necessary to stop or avoid material damage to public resources)		"Sediment delivery to project area due to activities on deep seated landslide feasures."	Yes	SW 1/4, S23;T32N;R14W	OESF	12 days to fix road, but no halt.
2607754	2008	OLY	16 Jefferson	emery	Ashley Emery	deviation		Changed from "uneven-age" to "even-age" without approval. No public resource damage has occurred	No	N 1/2, NW 1/4, SE 1/4, S9, T25N; R2W		
2608046	2007	OLY	05 Clallam		MUNRO LLC.	VIOLATION		"A seven foot diameter, live, red Cedar tree was cut down and partially remived from the riparian zone of a Type F" Stream."	Yes	SW 1/4, S19;T32N;R19W	OESF	
2608131	2007	OLY	05 Clallam		green crow timber		violation	"Sediment-laden water ...is then entering multiple Type "F" and "N" waters."	Yes	SW 1/4; S22; T31/R15W	OESF	Haul not allowed until acceptable road repair plan approved.
2608196	2008	OLY	05 Clallam	Steele	Lonnie Steele	deviation; violation		"...changed from "uneven-age" to "even-age" without approval. No public resource damage has occurred."	No	NE 1/4, NW 1/4, S36;T31;R9W		
2608408	2007	OLY	14 Grays Harbor		Chehalis valley timber	deviation		"1) Constructed road not shown on FPA. 2)Subgrade width too wide over undersized culvert.' 3)Fill slope too steep causing sluffing. (sediment delivery). 4)Sidecast of spoil/debris into typed water."	Yes	NW S35;T19N;R9W		
2608552	2007	OLY	05 Clallam		green crow timber	VIOLATION		"Approximately 421 feet of RMZ trees have been cut and removed along wetland "W1", which is a fish bearing water." Landowner self reported.	Yes	SW 1/4, S35, T31N; R15W	OESF	
2608632	2007	OLY	16 Jefferson		MANKE TIMBER COMPANY	immediate action		"No Activity has started...the stream listed as A-3 has Inner Gorge slopes >70%. ...This would classify the proposal as IV-Special...spacially intermittent Type Npwater, not Ns as indicated on the FPA. The end haul portion of this road is marked in the field,	Yes	SE14,SE1/4, S15; T27; R02W		Before starting, bound out or get new FPA.
2608850	2008	OLY	14 Grays Harbor		Rayonier forest resources, lp$\diamond$		immediate action	"Wet site adjacent to Washkah River." Presumably sediment into river.	Yes			"Cease harvest ... on Southwest Unit, except that which is approx 100' from 3290Rd... ."No harvest activities may continue without written approval from DNR Forester, EXCEPT" as above. Reevaluate in summer.
2608987	2008	OLY	05 Clallam		OLYMPIC RANGE TREE FARM	DEVIATION; violation		"Timber haul on Sekiu Mainline during wet weather and freeze and thaw conditions caused delivery of sediment laden water to the Sekiu River. The landowner temporarily shut down the roads to timber haul to avoid additional sediment delivery and to install		NW 1/4, NE 1/4, S15;T32;R14W	OESF	"Cease timber haul...when the ditches begin to flow sediment laden water toward typed waters."
2609084	2008	OLY	14 Grays Harbor		TREES INC	DEVIATION; VIOLATION; IMMEDIATE ACTION		Harvesting timber in Western Washington RMZ, Type F Water in the core zone. Failure to conduct forest road maintenance to the extent necessary to prevent potential or actual damage to public resources.	Yes	S 1/2, S33; T18; R8W		
2609220	2008	OLY	16 Jefferson	COONE	Reid Johnston, operator	IMMEDIATE ACTION		"These [skid trails]meet the road directly adjacent to, and on either side of flowing Type N clossing. As they are now, storm water will be able to run down these skid trails and flow diretly into the Type N stream. Additionally the main road surface has	Yes	NE 1/4, NW 1/4, S3, T25; R2W		5 weeks to complete road work; 9 months to reseed.
2609257	2008	OLY		COX	Manke, Tbr. Co.		IMMEDIATE ACTION	"The east harvest boundary was found on the ground to be located at a point less than the required 68 foot (no inner zone harvest option) from the stream segment A-3.	Yes	NW 1/4, S10;T18;R11W		"Prior to commencing falling, bucking or yarding within 90 feet of stream segment A-3... clearly mark a minimum 68 foot no inner zone harvest along entire east RMZ segment 3 boundary."
2609260	2008	OLY		cox	Manke, Tbr. Co.		immediate action	"**The East Unit 1**: The harvest boundary was found on the ground to be located at a point less than the required 105 foot (no inner zone harvest option) from the stream segment A-3 and segment A-4. **The West Unit 1:** The east harvest boundary ws found on the	Yes	NW 1/4, S10;T18;R11W		Prior to commencing felling, bucking or yarding, mark RMZ no-cut boundaries. Other activities may continue.
No FPA	2007	OLY	05 Clallam		ALOHA LUMBER CORPORATION	VIOLATION; IMMEDIATE ACTION		"Department of Natural Resources commenced operation (road abandonment) on Aloha property without an approved FPA. Actions impacted Taylor's Checkerspot Butterfly habitat."	Yes	NW 1/4, NW 1/4, S19;T30;R7W		Get FPA first.
No FPA	2007	OLY	14 Grays Harbor		GRAYS HARBOR COUNTY	VIOLATION		"Falling timber on site not permitted. No potential for resource damage. ...This action was self reported."	No	NE 1/4, S21;T21;R9W		Get FPA first.
No FPA	2007	OLY	05 Clallam		green properties llc. c/o pacific forest management	violation; immediate action		"1). Road construction and re-construction without an approved FPA. 2) Road construction in wetlands without confirmation of :no net loss of wetland function"."	Yes	SE 1/4, S30;T29N;14W	OESF	
No FPA	2007	OLY	05 Clallam	KING	Burl & Rebecca King	violation - "No resource damage."		No FPA. Harvest, yarding and hauling of about 2 A. No resource damage	No	NW/SW, S1,T29, R5W		
No FPA	2007	OLY	14 Grays Harbor	mcgivney	Michael McGivney	violation		1)Operation without and approved FPA. 2) Road location and design."	Yes	NESE,S33;T18,R9W		Cease all construction; get approved FPA.
No FPA	2007	OLY	14 Grays Harbor	ROPER	Katie Smiley	VIOLATION		No FPA. "Cutting and yarding ... ; prior to applying for FPA. ...There is potential fish habitat near the operation site. No resource damage is evident."	?	NE 1/4, SW 1/4, S33; T32; R12W	OESF	Stop all activities
No FPA	2008	OLY	16 Jefferson	erickson/moran	Alan Coone	Violation		"Three large (>20) maples cut near road at Type N stream crossing, one of the trees crosses the steam . The debris from this top of another tree was in the Type N culvert inlet."	Yes	NE 1/4, NW 1/4, S3;T25;R2W		No harvest , yarding, hauling till approved FPA and culvert cleaned out.
No FPA	2008	OLY	16 Jefferson	COONE	Rick Roper	VIOLATION		1/2 Acre cut, no FPA	No	NW 1/4,S21;T18;R8W		No harvest till approved FPA.
No FPA	2008	OLY	05 Clallam	SMILEY	Bryan McCloskey	VIOLATION		"Trees were cut that are in the core, Inner, and Outer Zones of Type "F" water. This activity is a trespas on Rayonier Land. Once discovered by operator that stopped & reported to Rayonier."	?	NE 1/4,SW1/4,S33; T32;R12W	OESF	No harvest till approved FPA.

COMPLIANCE WITH WATER QUALITY STANDARDS/CLEAN WATER ACT

Mark Hersh

Introduction:

The purpose of this article is to determine how well the alternatives comply with the requirements of the Clean Water Act. That requires a review of the sections in Chapter 3 that might be expected to affect water quality: riparian areas (page 119), stream channel conditions (page 175), soil (page 185), water quality (page 207) and fish (page 211). As discussed below, "water quality" actually includes more than a few parameters thought to be affected by forest practices.

Each analysis in the DEIS that corresponds to these major sections (components of the landscape or ecosystem), assesses a number of relevant parameters that have been affected by past practices and might change in response to implementation of the alternatives. The DEIS sets thresholds for each parameter and attempts to determine the significance of the changes.

Many parameters are relevant to more than one section (component), and these subsets of parameters can overlap. This is not an unsound approach, but caution must be exercised in that an incorrect conclusion regarding an important parameter can ripple through a number of components and lead to erroneous or unsupported conclusions.

In general, the thresholds chosen for evaluating each component are adequately discussed and referenced, but they are not cross-referenced with other "harder" regulatory thresholds such as the water quality standards (except in one case). In the riparian section, results from individual parameters are averaged without any explanation as to *why*. The overall result, in any event, is that the DEIS minimizes impacts to the riparian area from both alternatives without a sound basis for doing so.

Even before changes in individual parameters are considered, and the thresholds for determining whether the changes are "significant," the scale of the analyses must be considered. DNR, in this DEIS, has decided to conduct analyses at the Type 3 watershed scale, with Type 4 waters being the smallest waters considered. This is simply too limiting in regard to a determination of whether Clean Water Act requirements are met.

Riparian (page 119):

The section describing effects on riparian areas clearly lays out the importance of these areas and the connection between riparian conditions and instream conditions that can affect salmonids and other fish (pp 119-123).

Unfortunately, after this good start, there is one glaring omission and one fatal flaw.

There is a short discussion on wetlands (pages 122-123) and their importance. The DEIS refers to a number of earlier documents for an in-depth discussion of "wetland functions and values on state lands." Approximately 7% of the DNR-administered lands in the OESF is wetlands (Table 3-27, page 123). Wetlands in fact play a role greater than their percentage of the landscape might lead one to believe. It is unfortunate that they do not

merit greater discussion here, including even a cursory description of the level of protection that they currently receive. Smaller wetlands, if they have not been "typed" and are thought to have no connection to fish bearing waters, are especially vulnerable. The lack of a more complete discussion on wetlands and their importance is an unfortunate omission.

The fatal flaw is the decision to exclude Type 5 riparian areas from the analysis (page 125):

> Riparian areas along Type 5 waters were excluded from this analysis. A separate management protocol was outlined in the 1997 HCP for these small, headwater systems because of their abundance and variety on the western Olympic Peninsula. Management objectives in the OESF are to protect all Type 5 waters that cross unstable ground or occupy stable ground but have identifiable channels with evidence of water discharge or material transport. In the OESF, approximately 90 percent of Type 5 waters fall in the first category and five percent in the second (DNR 1997a). The remaining five percent were considered to exert a negligible influence on aquatic or riparian habitat and, thus, require no special protection.

The paragraph is not clear on what "protect" means and the document's reference to the 1997 HCP is not particularly helpful because identical language is in that document (1997 HCP, page IV.111). The 1997 HCP does go on to say that

> there are no available models or databases that specify which Type 5 channels require buffer protection. Hence, determinations of location and size of riparian buffers on Type 5 streams will be made on a case-by-case basis in the field, using a 12-step watershed-assessment procedure described later in this chapter (1997 HCP, page IV.111).

Presumably, this is the same "12-step watershed-assessment procedure" that is a major component of the No-Action Alternative (DEIS, page 7). The comparable procedure in the Landscape Alternative appears to be partially similar. The riparian assessment procedure is the "same as No Action but incorporated in the forest estate model" (DEIS, page 7) but other aspects, such as "stream channel condition" are assessed differently in the Landscape Alternative.

Overall, it is clear that Type 5 waters are not always fully buffered, but it is unclear when they will be buffered. Seeing as how impacts to Type 5 waters can continue downstream for some distance into Type 4 and Type 3 waters (e.g., increased temperatures, modified sediment and woody debris transport, etc.), this failure to assess affects on Type 5 waters most likely results in a severe underestimate of impacts as Type 5 waters make up 62% of the stream miles in the DNR ownership (page 121; 1,720 miles of Type 5 waters, 2,777 total stream miles).

Related to this is the accuracy of the Type 5 mileage assessment. The DNR hydrographic dataset has been shown to be inaccurate in a systematic manner in that the maps regularly underestimate the upstream extent of Type 4 waters (the DEIS admits to such later in the Soil section, page 193). Many streams are incorrectly mapped or not mapped at all. The foundation of riparian analysis rests in the assumption that the type and location of the stream channels that are known. Experience indicates that it is safe to assume that they are not.

Pages 126-132 discuss the riparian parameters that are measured. While the choice of parameters that were used to measure riparian effects is discussed in general terms, but not in terms of listed species in particular and aquatic species in general. Each parameter is looked at more or less as an end to itself, and not to what it translates to in terms of the aquatic communities that are the ultimate indicators. The thresholds that were chosen for "potential adverse environmental impacts" are not fully discussed, and neither is the threshold for "significant" impact.

The section on "Current Conditions for Riparian Areas" (page 133) indicates that many of these watersheds are already impaired. For example, of 405 Type 3 watersheds evaluated, 119 (29 percent) fully meet the specifications for adequate shade; therefore. 71% do not. On page 140, Table 3-34 states that currently, 129 watersheds of 426, or 30.3%, do not meet the criterion of no detectable change in peak flow. But the DEIS does not attempt to assess each Tier 3 watershed and determine the overall *current* health based on all the parameters. This is puzzling because that exactly how the document attempts (albeit in a flawed manner) to determine the effects of the alternatives on page 170.

On page 170, Table 3-47 aggregates effects and finds that only a few watersheds will be affected by either alternative. But that is only a count of the watersheds where the *average* impact is over 10% ("indicates the total number of Type 3 watersheds where the net potential impact, averaged across all riparian indicators, and averaged over many years, is greater than ten percent of the theoretical maximum. Null values were excluded from the calculation"). It is unclear why this particular level (10%) was chosen and more importantly, how this relates to instream conditions.

In any event, however, averaging tends to minimize impacts and is an approach that has little to do to actually predicting instream effects. For example, if water temperature significantly increases, it hardly matters that peak flows and other measured parameters have not substantially increased. The averaged impact from independent effects, averaged over many decades, is irrelevant when trying to determine instream effects or compliance with Clean Water Act standards.

Stream Channel Conditions (page 175):

This component is discussed in detail elsewhere in the OFCO submission. In addition to that critique, the scale of assessment, that of Type 3 watersheds/streams instead of at a finer scale (e.g., Type 5 channels), likely significantly underestimates the impacts that either alternative can have. The stream channel conditions are discussed in terms of "sensitivity," but the relevant discussion (in terms of compliance with the CWA) occurs below in the "Fish" section.

Soil (where sediment is assessed) (page 185):

The document assesses risk of erosion, compaction, and displacement, plus risk of sediment delivery. But once again, the scale is the Type 3 watershed level and it appears that sediment effects, given the nature of sediment transport in streams, are underestimated because Type 5 streams are ignored (page 193):

> Due to omission errors and the current lack in the extent of DNR's hydrographic dataset, the analysis may not be accurate. This analysis was performed using all stream types, which utilize different mapping techniques and are not consistently mapped across the planning unit. This method may cause the omission of streams that exist but are not mapped or could over-estimate the stream density in other areas.

Even with that, the analysis on page 193 indicates that

> the majority of Type 3 watersheds (195), totaling about 129,500 acres, were estimated to have a medium sediment delivery potential rating. Fifty-five Type 3 watersheds (~38,850 acres) were given a low sediment delivery potential rating, and *104 Type 3 watersheds (~44,300 acres) were placed into the high sediment delivery potential class* (emphasis added).

Almost 30% of the watersheds have a high sediment delivery potential. Chart 3-55 on page 194 reports on a different measure but gives a similar result that is that 30% of the assessed acres have a high sediment delivery potential. This is without assessing the sediment delivery potential of 62% of the stream miles (Type 5 watersheds). Effects assessed in this section are likely underestimated.

See elsewhere in the OFCO submissions (those of D. Montgomery and M. Haggarty) for analyses of the sediment modeling (summarized as Chart 3-73 on page 204) for critiques of the DEIS's claim that background sediment delivery is two orders of magnitude greater than that delivered by roads, and the DEIS analysis that the highest gradient streams are the rated in the lowest category for sediment delivery. Errors such as these in the DEIS make it impossible to determine if ultimately, either alternative would comply with Clean Water Act requirements.

Water Quality (page 207):

The term "water quality," can be defined narrowly or broadly. DNR first chooses to define the term fairly narrowly:

> Water quality is determined by variables that include temperature, sediment and organic input, and contaminants (page 207).

However, the document seems to recognize that the term has a legal meaning as well, which is broader (page 207):

> DNR's overarching management guidance has been to follow state and federal laws to protect water quality… The federal Clean Water Act delegates authority to the state to *protect aquatic habitat and domestic water supplies, among other beneficial uses* (emphasis added).

But the DEIS embraces a narrower view when it comes to actually determining whether its actions comply with the Clean Water Act (page 207):

> Washington State Department of Ecology (Ecology) Rules define the acceptable water quality standards for temperature, sediment, and turbidity levels. These levels were used in DNR's 2004

> Sustainable Harvest Final EIS, "to provide for the protection of designated uses, including public water supply; wildlife habitat; and salmon spawning, rearing and migration" and is incorporated here by reference… DNR complies with these standards in its day-to-day operations.

There are a number of problems with this approach. First, the Department of Ecology revised the water quality standards (WAC 173-201A) in 2003-2006 (the latter date representing the last of the numerous approvals of the US Environmental Protection Agency). The current standards include, among other revisions, more stringent temperature restrictions (13^{o}C from February 15 to July 1) to support native salmon, trout, and char (Ecology publication 0610038, November 2006). It is not enough to rely on standards referenced in a six-year old EIS. DNR needs to consider the current water quality standards, especially in terms of waters that may have the 13^{o}C temperature criterion in place to protect salmonids.

Second, and more seriously, the DEIS, with the focus on temperature, turbidity, and sediment, falls into a common, but incorrect, formula regarding compliance with water quality standards, that is, that the route to compliance means that one only needs to comply with numeric water quality *criteria*. Compliance with water quality standards requires more than avoiding violations of numeric water quality criteria. Water quality standards consist of beneficial uses, numeric and narrative criteria, and an antidegradation policy (USEPA 1994), three inter-related components.

While "water quality standard" is not defined in state law or regulation, the purpose of the water quality standards makes it quite clear that waters are protected by uses, criteria, and the antidegradation policy (WAC 173-201A-010(1)):

> The purpose of this chapter is to establish water quality standards for surface waters of the state of Washington consistent with public health and public enjoyment of the waters and the propagation and protection of fish, shellfish, and wildlife, pursuant to the provisions of chapter 90.48 RCW. All actions must comply with this chapter. As part of this chapter:
>
> > (a) All surface waters are protected by narrative criteria, designated uses, and an antidegradation policy…

While the DEIS says that "DNR complies with these standards" there is no evidence that this is the case. Rather, forest practice prescriptions advocated by DNR both in this plan and in past plans (e.g., the Forest Practices HCP (DNR 2005) simply do not protect all waters. Type 5 waters are not afforded buffers over their entire length, despite long-standing scientific consensus that buffers are needed to protect streams from increased temperatures and ensure somewhat natural wood, water, and sediment delivery regimes. This consensus is recognized in this DEIS -- but for waters other than Type 5 waters.

These last two points is most relevant when considering the scale of analysis; here it is limited to Type 3 watersheds and Type 4 waters as opposed to conducting an analysis that includes all waters, including Type 5 waters. The DEIS analysis provides one level of protection to "fish-bearing" streams and a lesser level of protection to "nonfish bearing." Long-standing USEPA (1994) guidance is clear on that point and equally unequivocal on the need to protect *all* aquatic species:

> No activity is allowable under the antidegradation policy which would partially or completely eliminate any existing use whether or not that use is designated in a State's water quality standards. The aquatic protection use is a broad category requiring further explanation. *Non-aberrational resident species must be protected, even if not prevalent in number or importance.* Water quality should be such that it results in no mortality and no significant growth or reproductive impairment of resident species. Any lowering of water quality below this full level of protection is not allowed.
>
> *A State may develop subcategories of aquatic protection uses but cannot choose different levels of protection for like uses.* The fact that sport or commercial fish are not present does not mean that the water may not be supporting an aquatic life protection function. *An existing aquatic community composed entirely of invertebrates and plants, such as may be found in a pristine alpine tributary stream, should still be protected whether or not such a stream supports a fishery* (emphasis added).

The latest revisions to Washington's water quality standards reflect the above EPA guidance (USEPA 1994). Regarding aquatic life, Washington's revised standards now explicitly protect "key" species or aquatic life history functions (for example, "char," "salmon and trout spawning," "core rearing, and migration," etc.). In this "use-based" system4, the standards assign a key species to be protected for each waterbody (the revised standards include lists of waters, sorted by drainage basins, with their corresponding uses). But even before the "key species" and their specific needs for protection are described, the regulation includes a provision that states "it is required that all indigenous fish and *nonfish* aquatic species be protected in waters of the state in addition to the key species" (WAC 173-201A-200) (emphasis added).

Simply put, there is nothing in either EPA guidance or in Washington's water quality standards that recognizes the dichotomy that the DEIS creates by failing to protect Type 5 waters. There is nothing in the DEIS that speaks to the direct protection of biological integrity in Type 5 waters and wetlands. Controlling impacts to control temperature, sediment, and turbidity on a limited subset of waters is the focus of the DEIS. This is not sufficient to comply with water quality standards.

The basic protection offered to headwater areas by both alternatives is similar to past forest practice plans (e.g., Forest Practices HCP (DNR 2005)). DNR's effort here to protect "water quality" is limited to reliance on complying with a few numeric criteria and a scale of analysis that excludes all waters (excluding Type 5 waters). Past plans did not protect biological integrity in headwater streams (Mendoza 2005) and it is highly unlikely that either alternative presented in this DEIS complies with Washington's water quality standards, as the level of protection provided is similar at best. Other efforts to provide a new standard for headwater streams also had problems (F&F Conservation Caucus 2009).

In addition, the major effort to gather data to evaluate Washington's forest practices with respect to Clean Water Act requirements has been unsuccessful thus far (Ecology 2008) and it does not appear that serious efforts have been made to ensure that forest practices comply with the antidegradation policy in particular

4 One of the 2003 water quality standards revisions was a change from a "class-based" system to a "use-based" system. DNR's Sustainable Harvest Final EIS (DNR 2004), upon which this document relies for compliance with water quality standards, describes the older "class-based" system, along with the older numeric criteria.

(Hersh 2009). Another review in this submission by OFCO (T. Thaler) considers whether the adaptive management strategy included in this DEIS is sufficient.

Fish (page 211):

This section assembles another subset of parameters, namely large woody debris, water quantity, fine sediment, and water temperature, all of which were evaluated in the previous sections, and discusses them in terms of fish. No real attempt is made to equate changes in fish numbers or fish habitat to differences in the alternatives, nor is any attempt made to equate "fish" with protection afforded by the water quality standards.

Summary:

The analyses included in the DEIS are fatally flawed in that only 38% of the waters are assessed – Type 5 waters are not included. There are a number of errors regarding measurement of specific parameters (e.g., sediment delivery) and there are errors regarding the "significance" of impacts (e.g., averaging impacts over a number of riparian parameters and over many years). As far as Clean Water Act compliance goes, the DEIS's failure to consider Type 5 waters as protected waters of the state, coupled with the failure of similar efforts to sufficiently protect Type 5 waters means that neither alternative likely complies with the Clean Water Act.

Given the fact that the Landscape Alternative will mean significantly higher harvest levels in both riparian zones (inner and outer) and wetlands (Table 3-11, page 92), implementation of this alternative means that Clean Water Act standards are not likely to be met. Harvest in wetlands is approximately one order of magnitude greater. In the first decade, approximately 10% of the wetland acreage will be harvested. Harvest in riparian zones (inner and outer) varies from 3 times greater to 8 times greater. In the first decade, approximately 3% of the riparian inner zone, and approximately 18% of the riparian outer zone will be harvested. The No-Action Alternative is likely to result in far fewer impacts.

References:

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USEPA. 1994. Water quality standards handbook. Second edition. EPA 823-B-94-005a. Office of Water. Washington, DC. 202 pp.

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REVIEW OF OLYMPIC EXPERIMENTAL STATE FOREST (OESF) HCP PLANNING UNIT FOREST LAND PLAN, DRAFT EIS

David R. Montgomery

Based on reading sections of the draft environmental impact statement (DEIS) for the Olympic Experimental State Forest I have serious concerns about the document and its assessment of the potential impacts of the alternatives evaluated.

The assessment of potentially unstable slopes beyond WSA Level 1 is noticeably lacking in the proposed analysis. Why are landslide hazards/risk not explicitly considered in the assessment of potential environmental impacts? The soils impact assessment section glosses over the problem of shallow landsliding and the role of post-harvest changes in root reinforcement on slope stability in steep forested terrain. This is of particular concern in that "up to 50 percent of the acres within a single Type 3 watershed" could be harvested in a single decade." It is not credible to argue that the potential for large portions of individual watersheds to be simultaneously in a state of low root strength would not create a significant potential for adverse impacts to these watersheds. Also, the projected harvest rotations under the Landscape Alternative are based on 1 to 1.3% of the riparian area per year (equivalent to a 77 to 100 year rotation) whereas that for the No Action Alternative is 0.3 to 0.5 % per year (equivalent to a 200 to 333 year rotation). Given that it takes on the order of 100 years to grow a tree large enough to function as a key member log it hardly seems credible to argue that there is no significant difference between these two landscape-scale rotations, as one would guarantee few, if any key member logs would be produced. How can a document intended to address the landscape scale effects of a forest plan not address the role of root strength loss following timber harvest?

The average timber stand rotation time appears to be on the order of 50 years (about 2% of the landscape per year). The Landscape Alternative projects a 25% to 50% increase in the timber harvest level above that for the No Change Alternative. This difference is identified as resulting from differences in the application of the riparian conservation strategy, but the reason for the difference is not clearly presented. The potential adverse environmental impacts of this increased harvest are dismissed without explanation or elaboration. How can this be reconciled with the statement 2 paragraphs below this dismissal that "*Nearly every Type 3 watershed is projected to experience detectable impacts to at least one indicator under the Landscape Alternative (97% of the Type 3 watersheds)*"? [DEIS, p. 169] This statement would appear to guarantee adverse impacts under either alternative being offered. Naturally, this raises the question of why only 2 alternatives are under consideration.

It also raises the question of why the apparently preferred alternative (the Landscape Assessment) is the preferred one, as the EIS states that "*For each indicator, the detectable impacts were most numerous under the Landscape Alternative*." These impacts appear to be then summarily dismissed by the subsequent statement that when all the impacts are considered together their probable impact is negligible. The reader is left to imagine for herself why the potential for numerous detectable impacts would be considered negligible. Several pages later the DEIS states that "...the Landscape

Alternative presents a greater risk of probably, significant, adverse, environmental impacts." [DEIS, p. 205] How could this be possible if all the impacts were indeed "negligible"?

The DEIS acknowledges that numerous sub-watersheds have the potential to exceed CMER standards for road sediment delivery, and that a number of Type 3 watersheds have projected road sediment impacts that exceed the "high" delivery class of 10 tons per stream mile per year. The DEIS states that the road related sediment inputs are projected to double under either alternative and chart 3-7 shows both the No Action and Landscape alternatives contributing more than 10^4 tons per stream mile per year. The DEIS uses a comparison with background erosion rates (determined by some method that is not presented) to dismiss such impacts as insignificant, as they are held to be a "small fraction of background levels". Unfortunately, the analysis of background erosion rates against which the projected road erosion sediment delivery is evaluated is not presented and, as discussed below, appears to be seriously flawed.

Chart 3-74, which compares background erosion rates and road sediment delivery rates, shows a background rate of about $2x10^6$ tons per stream mile per year as the background erosion rate. For a typical drainage density of 6 miles of stream per square mile for the drainage basins on the western Olympic Peninsula in the area of the OESF this would translate into an average background landscape erosion rate of $1.2x10^7$ tons per square mile per year ($4.68x10^6$ tons km^{-2} yr^{-1}). Assuming that the soil has a bulk density of 1200 kg/m^3 (1.2 tons/m^3) this is equivalent to a landscape lowering rate of more than 10 feet per year (3.9 m yr^{-1})! There is no way to consider such a rate to provide a credible assessment of the background erosion rate for these watersheds (or anywhere else on earth for that matter).

As the DEIS does not present how the background erosion rate was actually determined, I thought I would calculate it myself based on the erosion rates from the papers that the DEIS cites as the source for the background erosion rates (Brandon and others, 1998; Montgomery and Brandon, 2002; and Belmont and others, 2007) range from about 0.1 to 1.0 mm/yr for the Olympic Peninsula, with rates of about 0.5 mm/yr providing a reasonable upper bound for the area covered by the OESF Draft EIS. This erosion rate (0.5 mm/yr) is equivalent to about 1500 tons per square mile per year (or about 600 tons km^{-2} yr^{-1}). Given the typical drainage density of 6 miles of stream per square mile of watershed portrayed on the DNR hydro layer for the drainage basins on the western Olympic Peninsula in the area of the OESF, this would translate into a background sediment delivery rate of just over 250 tons per stream mile per year. Against this background rate of sediment delivery the projected sediment delivery of about 10^4 tons per stream mile per year under both No Action and Landscape alternatives would appear to have the potential for significant adverse impacts to stream sediment loads. So either something is seriously amiss with the model used to predict road sediment generation, or there is actually a significant potential for a substantial impact on sediment loads.

Were the costs of road building, maintenance, and refurbishing included in the estimates for Table ES-2? The text reads like they were not included. How would it affect the net revenue if it were? The EIS states that it would require "significant financial investment" to bring the roads up to forest practice standards. Were this to be done, since presumably it must be given the existence of such standards, then how would it affect the bottom line of the OESF plan?

The stream channel condition "assessment" based on remote sensing data (simple confinement/gradient classes) does not seem well scoped for ranking stream channel condition (as advertised in Table ES-1), as no information about condition is actually integrated into the assessment. Although the gradient, confinement basis does offer a solid foundation for such analyses, the lack of any ground-truthing of large woody debris abundance as part of the channel assessment is problematic given the acknowledgement in the DEIS that "deficiencies in large woody debris in key stream segments are responsible for the greatest limitations to salmonid habitat potential across state trust lands in the OESF." The management actions based upon the Landscape Analysis is acknowledged to lead to declining LWD abundance in some watersheds; yet these potential adverse impacts are apparently considered, along with all other potential impacts, as negligible. How is this justified?

In addition, the way that stream channel sensitivity is determined has a critical flaw in that the watershed sensitivity is, in effect, based on the extent of steep channels within each watershed, as those are the only ones that are classified as having a "low" sensitivity rating. So the overall watershed sensitivity rating and ranking has the odd effect of making those basins with the greatest proportion of steep headwater channels (8-20% and >20% slopes) the least sensitive, and thus have the lowest hazard. This simple averaging of the headwater channels, which tend to deliver any disturbance-driven sediment load rapidly to downstream channels with the downstream ones has the effect of making a low sensitivity assignment to channel networks in watersheds with a high proportion of steep headwater channels delivering to sensitive fish bearing channels downstream. It seems backwards that this would identify places where sensitive fish-bearing channels are downstream of numerous steep headwater channels (presumably draining steep potentially unstable slopes) as relatively insensitive despite the acknowledgement that such channels deliver disturbances efficiently, and thus effectively pass the risk of disturbance downstream rather than contributing to basin resilience as the proposed rating system portrays them as doing.

COMMENTS ON THE OLYMPIC EXPERIMENTAL STATE FOREST HCP PLANNING UNIT- FOREST LAND PLAN DRAFT EIS.

Mike Haggerty

Included below are my technical comments on the WDNR DEIS. My comments are limited to two parts of the DEIS. I have provided very brief comments on the alternatives, and more detailed comments on the analysis section, specifically: riparian, stream channel conditions, soil, and fish.

Chapter 2-Alternatives

No Action Alternative

The modeling of the No Action Alternative does not follow the guidelines set forth in the 12-step assessment, instead the DEIS defines four alternative harvest scenarios (A, B, C, and D). These four scenarios are then used in the simulated 12-step procedure across the OESF. The assessment and analysis does not incorporate current site specific stream and habitat conditions and leads to non-site specific scale management decisions.

The DEIS states (page 46), "*The 1997 Habitat Conservation Plan presents a working hypothesis that states that because —mass wasting and windthrow exert the greatest short- and long-term influences ⁄⁄ on restoring riparian habitat complexity, buffers that are —designed to minimize these effects will be sufficient to protect other key physical and biological functions of riparian systems ⁄⁄ (DNR 1997a, p. IV.106). This working hypothesis leads to the starting assumption that additional interior core buffers—beyond those areas already deferred from timber harvests and not adversely impacted by wind—are not necessary to restore riparian habitat complexity.".*

This hypothesis and assumption arenot logical and may not meet any of the HCP riparian conservation objectives. For example, there are hundreds of fish bearing stream segments within the OESF that contain no mass wasting hazard zones. The strict application of hypothesis would results in applying no inner-core buffers along these stream segments. This has been the recent strategy used by WDNR for many harvest units where inner-core buffers average 0-20 feet, followed by a exterior buffer of ~150 feet along Type 1 through 3 streams (OFCO 2007). This does not meet the requirements of the HCP or Incidental Take Permit.

The HCP (WDNR 1997) states (page IV.111), "*Each interior-core buffer will be designed to accommodate all channel, floodplain, and hillslope areas susceptible to mass wasting. Such protection would include channel-bed and floodplain surfaces that have the potential for trapping sediment and other materials carried downstream by debris flows and associated dam-burst floods. Riparian buffers that have been adjusted on the ground to accommodate site-specific physical conditions and conservation objectives, however, should be comparable in width to the recommended average buffers presented in this strategy*."

Somehow this has become interpreted by WDNR as the interior buffer only needs to protect potentially unstable slopes as defined by WAC 222-16-050. This was in fact the standard forest practice rule at the time HCP. The HCP only requires that all potentially unstable slopes must be protected within the interior buffers, not that only unstable slopes are protected with interior core buffers.

The HCP (WDNR 1997, page IV.58) states, "*buffer [interior-core] widths will be determined on a site-specific basis using a 12 step watershed assessment procedure and might vary locally with landform characteristics. Average widths are not expected to vary significantly…*" Figure IV.5 (WDNR 1997, page IV.58) depicts the expected average interior-core **RIPARIAN** buffer for the OESF, they are 150 and 100 feet for Type 1/2 and 3/4 streams respectively. The HCP states (WDNR 1997, page IV.111), "*Exterior riparian buffers are intended to protect the integrity of interior-core buffers from damaging winds. Exterior buffers will also help maintain channel-floodplain interactions, moderate riparian microclimate, shield the inner core from the physical and ecological disturbances of intensive management on upslope sites, and maintain diverse habitat for riparian dependent and upland biota."*

Based on the information provided in the DEIS it is not possible to determine if the No Action Alternative complies with the HCP or the ITP. The simulated 12-step process evaluates potential impacts across an entire Type 3 watershed. There are no detailed descriptions on how impacts are calculated or averaged across the Type 3 subbasin. The conservation strategy in the HCP states that buffers will be modified at the SITE scale. Therefore that is the scale that the potential impact should be evaluated.

From this point of the description of the No Action Alternative becomes even less clear. The DEIS contains four scenarios: A, B, C, and D.

- Scenario A: no need for additional inner or exterior buffer beyond unstable slopes and equipment limitation zone.
- Scenario B: a buffer up to 100 feet for Type 4 streams and up to 150 feet for Type 1, 2, and 3 streams.
- Scenario C: a buffer up to 100 feet for Type 4 streams and up to 250 feet for Type 3 streams and up to 300 feet for Type 1 and 2 streams.
- Scenario D: same as Scenario C, except for exterior buffers on unstable slopes that extend beyond 100 feet from Type 5 streams.

For Type 1-3 and Type 4 streams it is unclear how this meets the commitments contained within the HCP of average interior-core buffers of 150-160 feet (Type 1-3s) and 100 feet (Type 4 streams) and wind buffers where needed. The ITP further states that the above riparian protections represent the minimum level of riparian conservation that WDNR is committed to implement (NMFS 1999, page 2).

Landscape Plan Alternative

The Landscape Plan Alternative lacks sufficient detail in its description to determine what is actually being proposed. I could find nowhere in the document where it describes the size of either interior-core or exterior wind buffers. The modeling results in Appendix F appear to indicate that much of the riparian conservation objectives will be at least partially met, but it appears that either the wind buffers will be the primary buffers implemented or that limited exterior buffering will be applied. This alternative does not appear to meet the HCP riparian conservation objectives or the minimum standards set forth in the ITP.

Chapter 3-Riparian

The DEIS provides an inadequate discussion of the stream channel and riparian network. This is a huge problem given the complexity of the modeling effort undertaken. For example, Table 3-25 (page 121), footnote for Type 5 streams, the note reads: "*The current DNR GIS stream layer is believed to underestimate the number of Type 5 waters. Mapping standards and methodology vary according to ownership, which result in marked differences in mapped headwater stream density, precluding a direct comparison of stream mileage and density across ownerships Riparian section stream density.*" This very misleading and misrepresents the known distribution of stream channels across the OESF.

The most important issue related to the stream typing system is the typing of Type 4 streams, as it appears that many, if not most, mapped Type 5 streams are actually Type 4 streams. This information was first presented to WDNR in the "WDNR –Middle Coast Landscape Plan: Kalaloch Planning Unit- Channel Assessment" (Haggerty 2004a), as well as in Haggerty (2001) and Haggerty (2003). This issue was further discussed in detail throughout the development of the Landscape Plan. For example, there was a detailed discussion at the February 13, 2008 meeting in Olympia (this is the meeting where the need to develop a basin area to stream width model was discussed in detail).

Appendix C, page 63 includes a model for predicting bankfull width (BFW) based contributing basin area. The model does not cite the source of the data used to develop model, it just provides an equation with no explanation (see Equation 1).

Equation 1.

BKFW_FEET: Round(3.28083*4.6957*([BASIN_AC_WT]/247.1044)^0.41111,0)

The lack of citation and reference to model data makes it impossible to review the quality of the modeling effort since there is no disclosure on data source(s) or the significance of the relationship between bankfull width and contributing basin area. Nonetheless, it is better than the previous modeling efforts that arbitrarily assigned a stream width based on stream type. I used Equation 1 to develop the plot in Figure 1. This model is contrasted with the basin area-BFW model developed for the Middle Coast Landscape Plan- Kalaloch Planning Unit (Haggerty 2004a). Note that a two acre contributing basin area is predicted to yield a stream greater than two feet wide by WDNR's model (Equation 1). This model strongly suggests that the length of Type 4 streams shown in Table 3-25 is an enormous underestimate of the actual length of Type 4 streams.

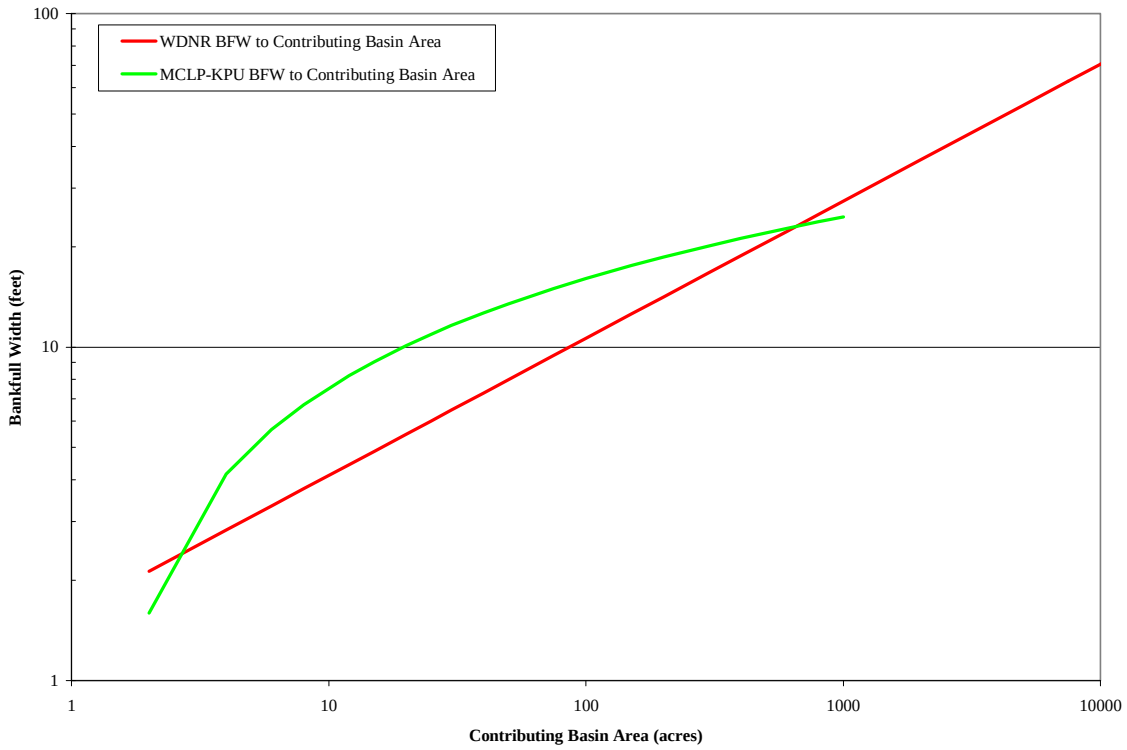

Figure 1. Comparison between WDNR DEIS and Middle Coast Landscape Plan- Kalaloch Planning Unit Channel Assessment Module bankfull width to contributing basin area models (source: WDNR 2010; Haggerty 2004a).

Due to the fact that the stream type layer is known to classify many Type 4 waters as Type 5, it would be unreasonable to assume that Type 5 streams are even mapped for most of the OESF. It would be reasonable to assume for modeling purposes that most mapped Type 5 streams are actually Type 4 streams. An alternative to this assumption would be to develop a synthetic hydro-layer that uses basin area and gradient to define stream types for modeling purposes. This would also be important for modeling the location of Type 2 streams since few are currently mapped but many streams meet the definition.

In addition, it should be noted that the currently applicable Riparian Management Procedure, which identifies the Forest Land Water Typing System is based on ordinary high water, not bankfull width, which is used in FP Water Typing.(Standard Practice Memorandum, September, 2005)

The DEIS states (page 124), "*The analysis of riparian function described in this section is restricted to Type 3 watersheds with greater than 20 percent DNR-managed lands (426 of* 594 Type 3 wat*ersheds, encompassing 91 percent of DNR-managed acres within the planning unit by area). This threshold was selected as the minimum level of management within a given watershed necessary for DNR land management practices to have an effect on watershed processes.*" There is no evidence provided to determine this is the appropriate evaluation threshold. All of the Type 3 stream's length could potential within WDNR ownership, but less than 20% of the watershed area could be within WDNR ownership, suggesting that significant impacts to fish

habitat could occur at the site, stream reach, or stream scales. Therefore, the DEIS arbitrarily evaluates which Type 3 watersheds will be evaluated to determine the probability of adverse impacts.

The DEIS states (page 125), "*Riparian areas along Type 5 waters were excluded from this analysis. A separate management protocol was outlined in the 1997 HCP for these small, headwater systems because of their abundance and variety on the western Olympic Peninsula. Management objectives in the OESF are to protect all Type 5 waters that cross unstable ground or occupy stable ground but have identifiable channels with evidence of water discharge or material transport. In the OESF, approximately 90 percent of Type 5 waters fall in the first category and five percent in the second (DNR 1997a). The remaining five percent were considered to exert a negligible influence on aquatic or riparian habitat and, thus, require no special protection."* There are no data to support the initial hypothesis used in 1997 and no data have been collected by WDNR during the past 12-13 years to support this hypothesis. This is purely speculative conjecture. In addition, the goal to protect all Type 5 waters that occupy stable ground and have identifiable channels with evidence of water discharge or material transport has no process based strategy or guidelines for achieving the goal of "protecting".

A review of harvest activities on the OESF was conducted in 2007 by Olympic Forest Coalition (OFCO 2007). This review included planned harvest activities in fiscal years 2005-2007. The review found that less than 33 percent (47 of 145 Type 5 streams) of all Type 5 streams included a defined riparian buffer and that the average width was less than 30 feet. No methods were provided in the FPAs for determining which T-5 streams had identifiable channels, nor is there documented rationale for determining the riparian zone width needed to "protect" the stream. No wind buffers were applied to any of these "Type 5" streams despite the fact that the HCP assumed that the expected wind buffers on Type 5 streams would average 50 feet. The total average buffer width was less than 60% of the "expected" average exterior buffer width. What might be even more important is there was also no documented evidence within the FPAs that these streams were in fact Type 5 streams (less than 2 ft wide).

Indicators of Riparian Function

Large Woody Debris Recruitment

This section of the DEIS is incoherent. The DEIS states (page 125), "*Numerous studies have shown that large woody for fish and other aquatic organisms (Swanson and others 1976; Harmon and others 1986; Bisson and others 1987; Maser and others 1988; Naiman and others 1992; Samuelsson and others 1994). Trees and other large pieces of wood that fall into streams provide critical physical and biological functions such as sediment retention (Keller and Swanson 1979; Sedell and others 1988), gradient modification, channel structural diversity (Ralph and others 1994), nutrient production and retention (Cummins 1974), and protective cover from predators (Bisson and others 1987; Bilby and Ward 1991)."*

First sentence is incomplete, the rest of the paragraph describes the biological and geomorphic importance of LWD. There is no discussion about LWD recruitment, for example what are the recruitment sources and processes (mortality, windthrow, bank erosion, mass wasting, etc…). The section needs to be re-written to fully describe LWD recruitment processes and sources.

The DEIS states (page 126), "*A number of recent studies have examined the source distance for instream woody debris for the purposes of assessing the functional effectiveness of forested riparian buffers. In general, these reports have determined that 50 to over 95 percent of potential large woody debris recruitment to streams originate within 30 meters of the channel (Bragg 2000; Welty and others 2002; Gregory 2003; May and Gresswell 2003; Benda and others 2003; Liquori 2006). Therefore, only those stands within 100 feet of the channel were evaluated.*" Based on the literature cited, the conclusion is arbitrary and limits WDNR's ability to assess LWD recruitment. If some studies show that 50 percent of LWD comes from greater than 100 feet from the stream why set an analysis limit of 100 feet?

In addition the DEIS uses the Watershed Analysis Riparian Module methods to characterize riparian vegetation in size and species classes. This is an insufficient indicator for modeling differences in LWD recruitment through time. The HCP (WDNR 1997) concluded that for Type 1 and 2 streams a 150 foot buffer will provide for 90% of the natural level of instream LWD. This implies a target of 90% of natural LWD levels for these stream types, since the expected interior core buffer width for these stream types is 150 feet.

The DEIS assigns values of 1, 2, or 3 based on low, moderate, or high recruitment potential from within the nearest 100 feet of the stream channel. The DEIS then determines an area weighted sum score for riparian recruitment potential at the Type 3 watershed scale. The DEIS then states (page 126), "*For the purposes of this analysis, the maintenance of function is interpreted as a non-declining trend for the indicator in question*." This does not meet the riparian conservation objectives established in the HCP, to maintain and restore. Simply maintaining current recruitment potential does not meet the goal of restoring riparian function. In addition, the method of averaging does not take into account the site specific potential adverse impacts or the impacts at the most important biological scale (e.g., for fish bearing streams). The averaging is also used across ten decades, masking the potential impacts in one or two decades. This method also does not even ensure maintenance of exiting potential since it limits the area evaluated to the nearest 100 feet. This does not make since riparian tree species such as Sitka spruce typically reach heights of 225 to 250 feet at maturity (Franklin and Dryness 1973), and in some cases can reach heights in excess of 300 feet.

The DEIS also does not explicitly differentiate interior and exterior buffers in this modeling process. This is inconsistent with the WDNR HCP. The HCP states that the interior-core buffers are intended to protect and aid natural restoration of riparian processes and functions. That is riparian functions such as LWD recruitment are to be adequately addressed through the designation of interior-core buffers. The exterior buffers are intended to "protect the integrity of the interior-core buffers from damaging winds" (WDNR 1997). Any modeling effort must explicitly differentiate functions provided from these two buffer types!

The DEIS also does not evaluate the current LWD conditions in channels and therefore can not predict current or future conditions. This is necessary evaluation to ensure that the Landscape Plan will result in restoring habitat conditions as described in the HCP.

Leaf and Needle Litter Recruitment

The DEIS states (page 127), "*Nearly all leaf and litter recruitment occurs within about 75 feet from the streambank—one-half site potential tree height (FEMAT 1993). Within that distance, the condition of riparian forests along all Type 1 through 4 waters was assessed.*" First, the SPTH for the OESF is not 150 feet. The DEIS

does not state specifically where the 75 feet comes from in the above statement. The WDNR HCP (1997) states, "*FEMAT (1993) suggest that input of plant litter or other organic particulates from streamside forest decreases beyond a distance of about one-half tree height from the active channel margin…Hence, the working hypothesis for the OESF is that sufficient forest-generated nutrients will be supplied from the area of interior-core buffers to maintain nutrient delivery to streams*." That is, the WDNR HCP established 100-150 ft zones to maintain and aid restoration of nutrient delivery to streams. The DEIS purposes to evaluate only 75 to 50% of the area hypothesized in the HCP to provide nutrients. This method is inconsistent with the HCP and limits the range from which nutrients are modeled to be delivered.

In addition, this analysis does not incorporate nutrient delivery and routing from Type 5 streams which make up the majority of the stream network within WDNR's model. This further limits the Plan's ability to model and evaluate riparian nutrient inputs. The analysis and modeling work does not explicitly differentiate interior and exterior buffers. This is inconsistent with the WDNR HCP. The HCP states that the interior-core buffers are intended to protect and aid natural restoration of riparian processes and functions. That is riparian functions such as nutrient recruitment are to be adequately addressed through the designation of interior-core buffers. The exterior buffers are intended to "protect the integrity of the interior-core buffers from damaging winds" (WDNR 1997 page IV.112). Any modeling effort must explicitly differentiate functions provided from these two buffer types.

The DEIS uses a non-declining from current condition assessment to determine the potential for adverse environmental impact. This is inconsistent with conservation objectives outlined in the HCP. The riparian conservation objectives are to maintain and aid restoration of riparian function. The threshold required in the HCP is not to simply maintain current conditions but to ensure that future conditions improve where they are currently degraded.

Shade

The DEIS establishes an "area of analysis" of within 75 feet of Type 1 through 4 waters. The rationale provided for determining the analysis area does not appear applicable to the goals established in the WDNR HCP. The WDNR HCP states, "The proposed interior-core buffers [100-150 ft], hence, are expected to be wide enough to provide 80 to 100 percent of stream shade…". If the HCP determined that 100-150 ft buffers were required to provide 80 to 100 percent shade, why evaluate only 75-50% of the area required to provide the goals for shade? The referenced shade targets, WAC 222-30-040 are not applicable as they are not part of the OESF HCP, nor have they been validated to comply with the Washington State Water Quality Standards.

The shade analysis also includes few details on how the modeling was conducted. This makes this section inadequate for inclusion in the DEIS. A review of Appendix C (page 62) indicates that some form of shade targets were defined based upon elevation and the old Washington State Water Quality Standards. These standards are no longer applicable, this is especially important to consider where bull trout are present.

A review of model outputs (Appendix F pages 48-4,799) appears to indicate that shade values were averaged at the Type 3 watershed scale. This is an inappropriate method for determining shade impacts and compliance with the water quality standards. This needs to be done at the stream segment scale not the Type 3 watershed scale or the WAU scale. This type of methodology does not ensure

compliance with the water quality standards, as impairment can occur at the stream reach and stream segment scale, which is the scale for 303(d) listing.

The DEIS states (page 136), "*A summary of current riparian shade is provided in Chart 3-29 and Table 3-31 below. For the 405 Type 3 watersheds evaluated, 119 (29 percent) fully meet the specifications for adequate shade."* There is no context here, what specification for adequate shade, there are the goals defined in the HCP, but these specifications are not included in the DEIS. The DEIS then states, "*However, the mean and median values for the extent of the riparian area with adequate shade were 78 and 87 percent, respectively, indicating that on average riparian shading, while not fully compliant, is generally good across the planning unit."* Again this lacks context and is subjective, what does generally good across the planning unit mean?

The lack of methodological details in shade analysis precludes me from further commenting on this section of the DEIS, as the relevance of the results of the analysis is unknown at this time. However, chart 3-44 (page 154), at decade six shows an order of magnitude increase in the number of Type 3 watersheds with an observed potential adverse environmental impact to stream shade. It is unclear how this is consistent with the HCP.

Microclimate

The DEIS states (page 129), "*Thermal recovery can be quite rapid, however. Summers (unpublished, as cited in Moore and others 2005) found that shade recovery to old- growth levels occurs within about ten years in the Oregon Coast Range western hemlock zone, and in experimental studies, temperature recovery occurred within five to ten years or was at least underway for several rain dominated streams (Brown and Krygier 1970; Harris 1977; Feller 1981; Harr and Fredriksen 1988).*"

First, shade recovery does not equate to microclimate recovery. The riparian microclimate includes: patterns of shortwave radiation, shade, air temperature (both vertically and horizontally, relative humidity, soil moisture and temperature, air movement and wind speeds (Chen et al. 1999). The DEIS (page 129) improperly cites the author. Moore et al. (2005) state, "*Summers (unpublished, cited in Beschta et al., 1987) found that shade levels at sites that had been clear-cut and burned recovered more rapidly in wetter forest types and at lower elevations. Shade recovery to old-growth levels occurred within about 10 years in the Coast Range western hemlock zone and about 20 years in the Cascade Mountain western hemlock zone. Shade recovery was only 50 percent complete after about 20 years in the higher elevation Pacific silver fir zone in the Cascades. Shade recovery depends not only on vegetation growth but also stream width: narrow streams should recover more rapidly.*

Shade recovery is not simply restored in all forest types within 10 years as implied by the authors of the DEIS who selectively cite the work presented in Moore et al. (2005). And again, shade recovery does not equate to microclimate recovery.

In addition the DEIS implies that the studies (Brown and Krygier 1970; Harris 1977; Feller 1981; Harr and Fredriksen 1988) were related to microclimate recovery. This is an incorrect representation of these studies. These studies evaluated the effects of clear-cut logging on small headwater streams. This is not directly related to microclimate issues across the OESF. The DEIS authors do not properly cite the text in the DEIS, as it appears to be copied and pasted into the DEIS from Moore et al. (2005). Moore et al. (2005) state , "*In*

experimental studies, temperature recovery occurred within 5 to 10 years or was at least under way for several rain dominated streams (Brown and Krygier, 1970; Harris, 1977; Feller, 1981; Harr and Fredriksen, 1988). However, recovery took longer in other cases or was not detectable in the post-harvest period in some cases."

The DEIS misleads the readers into believing the literature cited is applicable to microclimate issues across the OESF and fails to represent the actual findings of the authors cited. In addition, temperature recovery in some small headwater streams alone does not equate to microclimate since it is only one component of a suite on climatic attributes.

The DEIS assumes that the only microclimate impacts are from timber types in the Ecosystem Initiation stand development stage. All stands that are not new clearcuts are assumed to have properly functioning microclimates. This is a baseless assumption and lacks scientific rationale. Therefore, the remaining arguments with respect to microclimate impacts are without merit for further discussion. The entire microclimate portion of the analysis needs to be redone.

Windthrow

The approach to windthrow modeling is interesting and a good step forward. However, I see several problems with the approach used. Firstly, the modeling effort only examines the first 25 meters of the riparian area but it is clear that this does not account for all normally occurring windthrow. There has been no validation or calibration of the model on the OESF. This should be the first step to using the model, a hind cast comparison of the predicted versus the observed windthrow. This would be easy to do. I have included one example of a recent clearcut harvest in the OESF to show what the real-world potential windthrow impacts can look like, for comparative purposes only.

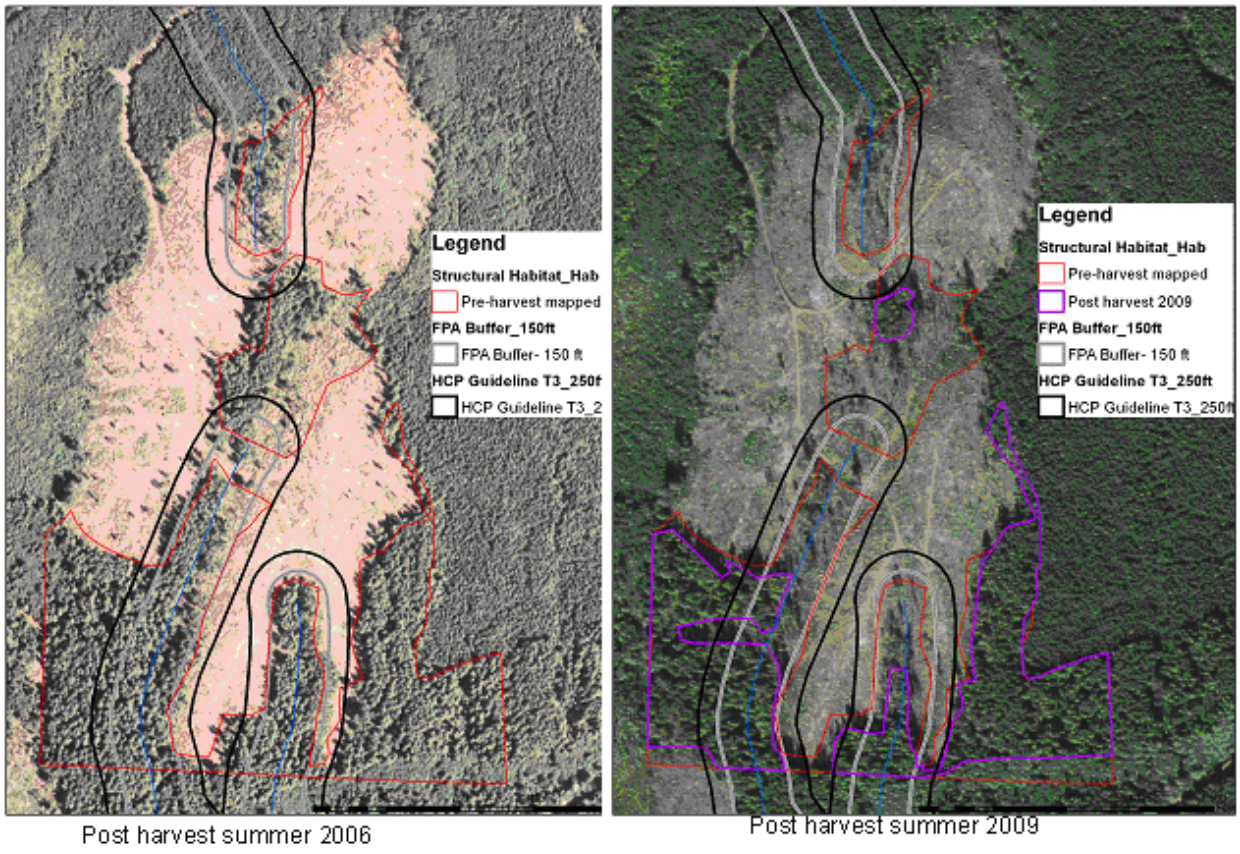

Figure 2. GIS comparison of windthrow impacts on riparian and structural habitat leave areas for FPA#2605120.

Within the example above note that the vast majority of riparian areas were afforded a buffer significantly smaller than the average buffers described in the WDNR HCP. After the winter of 2005-2006 significant windthrow damage occurred to both riparian leave areas and mapped structural habitat. More windthrow occurred between the summer of 2006 and the summer of 2009. All riparian buffers and structural habitat in the northern most stream were destroyed due to windthrow. Approximately 90% of the structural habitat around the wetland in the center of the figure was lost, windthrow distance from harvest edge exceeded 250 meters in both 2006 and 2009. Substantial windthrow damage can be seen in riparian areas and structural habitat in both the 2006 and 2009 photos for the southern end of the forest practice. Pre-harvest structural habitat included 62.7 mapped acres, by the summer of 2009 this was reduced to 31.6 acres; greater than a 50% reduction in structural habitat.

The modeling approach does not appear to account for windthrow of deferred habitat and that might have significant impacts on predicted versus resulting stand types through the implementation period.

The approach to windthrow modeling used in the DEIS does not account for normally reoccurring severe windstorms. Any form of planning or management based on this modeling approach would be

the equivalent of building bridges or installing culverts to pass the 2-yr flood but not accounting for the 10, or 20, or 50 -year flood event. The WDNR HCP states (page IV.106), "…*mass wasting and windthrow exert the greatest short- and long-term influences. Hence, the conservation strategy explicitly addresses these two driving factors by creating riparian buffers designed to minimize mass wasting and windthrow*." The assessment of the current condition seems inconsistent with the HCP strategy and previous findings regarding windthrow.

The analysis of resulting impacts from windthrow miscalculates the results. The model constrains windthrow to the first 25 meters of the edge, therefore results, reported as a percentage of riparian acres should be reported as the maximum potential, not as a percentage of all riparian areas. See Table 3-33 (page 140), it states, "*output. Data shown for riparian areas within 150 feet of the 100-year flood plain of Type 1 and 2 waters and within 100 feet of the 100-year flood plain Type 3 and 4 waters and on DNR-managed trust lands within the OESF."* The analysis fails to report which portion of the riparian buffer, interior-core, or exterior-wind buffer is predicted to be impacted by windthrow. This is important because of the constraints of the model being the first 82 feet (25 meters) from the buffer edge.

The DEIS states (page 160), "*Windthrow extent is minimal under the No Action Alternative, with less than 100 acres predicted in any time period. Windthrow is approximately five to six times higher under the Landscape Planning Alternative.*" I did not have the time to go through each of the tables in the nearly 5,000 pages of Appendix F but a review of chart 3-50 (page 161) indicates that the No Action Alternative predicts ~370 acres of windthrow in riparian areas. The Landscape Alternative predicts ~4,470 acres of windthrow in riparian areas. This yields an increase of 12 to 13 times higher under the Landscape Planning Alternative versus the 5 to 6 time increase reported in the DEIS.

The DEIS concludes (page 16), "*The net potential impact under both alternatives is small, at or near 0.5 percent of the theoretical maximum for the No Action Alternative, and less than three percent of the theoretical maximum for the Landscape Alternative (Chart 3-52). The general trend is somewhat variable, but shows a small increase in net potential impact under both alternatives.*" This appears to be a misrepresentation of the actual impacts. Over the 90 year period depicted in Chart 3-50 the Landscape Alternative predicts approximately 4,470 acres of riparian are impacted by windthrow. Again I did not have access to the full suite of modeling results but dividing the results from Chart 3-50 by the results in Chart 3-52 yields an estimated 23,500 acres of riparian habitat evaluated by the model. Therefore just over 19 percent of the riparian area is predicted be affected by windthrow. This level of impact does not meet the HCP riparian conservation objectives. Over the duration of the plan, over 450 miles (miles = [[[4,470*43,560]/82]/5280]) of stream adjacent riparian habitat are predicted to be blown down. In addition, none of this blowdown accounts for the normally reoccurring severe windstorms (see comments above).

Chapter 3 - Stream Channel Conditions

This analysis component within the DEIS is flawed. One key element missing from the channel condition assessment is data or analysis of the current channel conditions, this is totally lacking. There are numerous sources of stream channel condition data within the OESF (e.g., Currence 2001; Cederholm and Scarlett 1997; De Cillis 2002; Haggerty 2004b; Haggerty and Ritchie 2004; Haggerty et al. 2009; Martin 1995; McHenry et al. 1994; McHenry 1999), but none of these sources of information are included in the DEIS.

In addition, there are several important components of the sensitivity rating section that make this section fatally flawed. The first component of the flaw directly relates to the sensitivity ratings. The DEIS states (page 176),

> "The sensitivity ratings used in this analysis for the channel segments were developed from a review of watershed analyses in the OESF that were either approved or initiated under forest practices (Coho 1995; Jackson 1996; Lamana and others 1996; Lautz 2001; Bohle 1999; Quinault 2001; Rayonier 1998; Sasich and Dieu 1995). The draft unpublished DNR plan for Kalaloch landscape and methods outlined in the Washington Forest Practices Board *Standard Methodology for Conducting Watershed Analysis* (DNR 1997b) were also used."

A review of these analyses indicates the following:

- Coho (1995) no direct channel sensitivity ratings that can be directly integrated into the DEIS's rating system.
- Jackson (1996) no direct channel sensitivity ratings that can be directly integrated into the DEIS's rating system.
- Lautz (2001) did not conduct the channel assessment, Lautz (2001) conducted the hydrology assessment. The channel assessment was conducted by Sue Perkins (Perkins 2001). This assessment included comparative channel sensitivity ratings (high, moderate, and low). However, the Perkins ratings were substantially different than the DEIS's for many of the channel gradients and confinements.
- Sasich and Dieu (1995), this assessment included comparative channel sensitivity ratings (high, moderate, and low). However, some these ratings were substantially different than the DEIS's for many of the channel gradients and confinements. Of particular importance is the channel sensitivity ratings for streams > 20% slope. The DEIS assigns low sensitivity ratings for all inputs, for all confinement classes. However, the Sasich and Dieu (1995) assessment provided a moderate rating for peak flows if changes were high and bank erosion and hillslope undercutting could occur. In addition, they provided a moderate rating for LWD where LWD was performing structural function.

I did not have the opportunity to review Bohle (1999), Quinault (2001), or Rayonier (1998) and therefore can not comment on their applicability to the sensitivity ratings.

The DEIS directly omits three additional channel assessments (Kennard 1999; McHenry 2002; and Haggerty 2004a). Each of these assessments included comparative channel sensitivity ratings (high, moderate, and low). Several of these ratings were substantially different than the DEIS's for many of the channel gradients and confinements. A summary of channel sensitivities from Haggerty 2004a is included below in Table 1. Of particular importance is the difference in LWD sensitivity ratings for low (<2%) and high gradient channels (>20%). The DEIS gives a low sensitivity rating to unconfined streams less than 1 percent gradient. I could find no similar rating in any of the analyses. The DEIS also give a low sensitivity rating to LWD in high gradient channels. All analyses that evaluated high gradient channels either had conditional ratings of low and moderate, or a straight moderate call for this gradient class.

More importantly is the DEIS tries to define a generic channel sensitivity based on gradient and confinement. This is methodologically incorrect, for planning at the site or reach scale (the intent of the OESF), as multiple stream types with different sensitivities can occur within and between gradient and confinement classes. Sensitivities are directly linked to channel geomorphic units not gradient and confinement. Identification of differences in channel processes and sensitivity is one of the major goals of the channel assessment component of a watershed analysis (WFPB 1997). The channel analyst must interpret the dominant channel- and habitat-forming processes, and determine the stream segments sensitivity to each input variable (WFPB 1997). By creating a generic sensitivity analysis there is no direct linkage between the inputs and dominant channel- and habitat- forming processes at the site or stream segment level. In addition, this strictly gradient and confinement driven assessment totally disregards fish habitat forming processes which is another key goal of any channel assessment.

Table 1. GMU sensitivities to specific inputs for the Middle Coast Landscape Plan- Kalaloch Planning Unit (Haggerty 2004a).

Geomorphic Unit and Gradient	Geomorphic Unit Description	Indicator Reach	Coarse Sediment	Fine Sediment	Peak Flows	LWD	Catastrophic Events
1 (<2%)	Mainstem and Side-Channels	na	High	High	High	High	High
2 (<.2%)	Low Gradient Ponds, Wetlands, and Regime Channels	H429	Low	Low (non fish) High (fish)	N.A.	Low (non fish) High (fish)	Low (based on hazard potential)
3 (.1-2%)	Pool-Riffle	H374 C345 K17 K792	High Moderate (for streams on terraces a long distance from sediment sources)	High	N.A.	High	Moderate Low (for streams on terraces, a long distance from potential events)
4 (2-4%)	Forced Pool-Riffle/Plane Bed	H447 H516 H530	High Moderate (for streams on terraces a long distance from sediment sources)	High	N.A.	High	High Low (for streams on terraces, a long distance from potential events)
5 (4-8%)	Step-Pool	H475 H478 H481 H978a	High	Moderate	N.A.	High	High Low (for streams on terraces, a long distance from potential events)
6 (8-20%)	Forced Step-Pool	H978	Moderate	Moderate	N.A.	Moderate	High
7 (>20%)	Forced Step-Pool	H1066	Low	Low	N.A.	Moderate	High

The DEIS states (page 176), "*For example, large woody debris in high gradient, confined streams may exert some influence over channel form. However, these same streams are insensitive to such inputs relative to lower gradient, less confined streams*." This is an over-reaching statement and is inconsistent with the current rating system defined by the DEIS. The high gradient channels were assigned a low sensitivity to LWD but so were unconfined streams less than 1%.

While the above discrepancies from standard channel methods of assigning channel sensitivities may not be fatal flaws in of themselves, the next step described by the DEIS is. The DEIS states (page 177), "*Within each Type 3 watershed, the proportion of channel length in each sensitivity class (low, moderate, high) was calculated. The results were used to aggregate the stream-segment assessment to the Type 3 watershed scale. Stream channels with a low, moderate, or high sensitivity were given a value of one, two, or three respectively, and a numeric score was calculated using a length-weighted sum for the entire Type 3 watershed. The score ranges from one to three, inclusive. Type 3 watersheds with a score from 1.0 to 1.5 were given a low sensitivity rating for the specific type of input, from 1.5 to 2.5 a moderate sensitivity rating, and from 2.5 to 3.0 a high sensitivity rating."*

Channel sensitivities should be broadly assigned at the channel geomorphic level and adjusted at the stream reach or segment level. The concept of defining channel sensitivity ratings at the somewhat arbitrarily defined Type 3 subbasin is illogical at best. There is no such thing as a watershed scale channel sensitivity rating, that was made up by the authors of this DEIS.

Chapter 3 - Soil

Risk of Sediment Delivery

This section does not specify all of the methods used. I'm not sure what the purpose of this section of the DEIS is, if you do not know the spatial distribution of the channel network how can you accurately perform the calculation? How does this compare to stream density?

Background and Road Use Sediment Delivery Potential

This section (pages 194 -197) of the DEIS is confusing. There are few descriptions of the methods used to develop background and road use sediment delivery potential. This is critical information that is not included in this section of the DEIS. Within this section I do not see estimates of background or road use sediment delivery, just a conclusion. The DEIS (page 197) concludes, "*According to the Cooperative Monitoring, Evaluation, and Research (CMER) Committee (2010) standards, all sub-watersheds have a low delivery rating because none exceed six tons per stream mile per year.*" The estimates included in Chart 3-66 do not include road use, so it is misleading to describe all sub-watershed as having a low delivery potential for road use when that is not what has been modeled. Furthermore, citing a CMER workplan as the "target" also seems inappropriate. The link to the document does not work, the work plan being cited is no longer available at the website for review.

This section of the plan should be deleted or rewritten.

How do the Alternatives Compare?

Sediment Delivery Potential

The DEIS (page 200) states, "*The Cooperative Monitoring, Evaluation, and Research Committee (CMER) standards specify ten tons of sediment per stream mile, per year within each sub-watershed as the maximum amount of sediment that may be delivered to a stream without causing a probable, significant, adverse environmental impact to water quality, stream morphology, and fish populations.* The conclusion is uncited. I'm also unaware of validation of this assumption by CMER or others. The DEIS could be referring to the Forest and Fish HCP Appendix N schedule L-1 performance targets.

Table 2. Forest and Fish Report performance targets for roads (source: CMER 2005; WDNR 2005).

Input	Measures	Performance Targets	
		New Roads	*Old Roads*
Sediment	Road sediment delivered to streams	Virtually none	
	Ratio of road length delivering to streams/Total stream length (mile/mile)		Not to exceed: Coast (Spruce) 0.15 – 0.25 mi/mi West of Crest 0.15 – 0.25 mi/mi East of Crest 0.08 – 0.12 mi/mi
	Ratio of road sediment production delivered to streams/Total stream length (tons/year/mile)		Not to exceed: Coast (Spruce) 6 – 10 t/yr/mi West of Crest 2 – 6 t/yr/mi East of Crest 1 – 3 t/yr/mi
	Mass wasting sediment delivered to streams	Virtually none triggered by new roads	Favorable trend
Hydrology	Road run-off	Same as road-related sediment.	Same as road-related sediment.

The FPHCP (WDNR 2005) includes performance targets for both new and old roads. Within the OESF the performance target for road sediment delivered to streams for new roads is "virtually none", this implies levels substantially less than targets for old roads. In addition the performance targets also include another target for old roads, the ratio of road length delivering to streams per length of stream (not to exceed 0.15-0.25 road miles/stream mile).

It is important to note that the "old road" performance target for tons/yr/mile vary depending on zone. In Western Washington there are two separate zones for performance targets: Coastal Zone (which corresponds to the Sitka Spruce Zone as defined in Franklin and Dryness, 1973) and the West of Crest zone. Therefore, if these performance targets were to be used they would be different for different parts of the OESF. Franklin and Dryness (1973) describe the spruce zone as, "*The Picea sitchensis Zone [spruce zone] is generally only a few kilometers in width, except where it extends up river valleys. On the west side of the Olympic Peninsula, where an extensive coastal plain exists, it is much broader. Although the zone is generally found below elevations of 150 meters, it goes to 600 meters when mountain masses are immediately adjacent to the ocean "*

Franklin and Dryness (1973) include a generalized vegetation map of Oregon and Washington. This map was digitized by DNR at the 1:2,000,000 scale during the emergency stream typing era for Type N streams. It is unclear whether this map has applicability to defining performance targets for the OESF. I did quick GIS exercise and found that 46,600 acres fell outside of the spruce zone.

I also reviewed the previous background erosion work conducted by WDNR (Jaross 2009a; 2009b). I compared the estimated background erosion rates by WAU depicted in Slide 17 (Jaross 2009b) to the proportion of the WAU contained within the mapped spruce zone (WDNR 2001). The average background erosion rates for WAUs entirely contained within the spruce zone were only 55% of the rates for WAUs with a portion of their area outside of the spruce zone. The highest background rate occurred in the WAU with the least amount of area within the "spruce zone".

The DEIS (page 201) states "*Each sub-watershed was assigned a qualitative rating based on sediment delivery from the existing road network (without traffic) relative to CMER standards (Low=Below CMER threshold, Moderate=At CMER threshold, High=Above CMER threshold). The proportion of sub-watersheds in each category for selected watersheds administrative units is shown in Chart 3-70."* Again it is unclear what CMER threshold is being referred to. Using only tons per stream mile ignores the other two performance targets. Also, note that none of these performance targets have been validated as to whether they comply with the Washington State Water Quality Standards.

The DEIS (page 201)states, "*Using the Washington Road Surface Erosion Model, sediment delivery potential was assessed in each sub-watershed resulting from log truck traffic associated with DNR timber removal.*" This approach is inappropriate since it does not account for ALL log truck traffic on WDNR lands. In addition, the modeling description included in Appendix C does not provide sufficient information to determine whether the actual road network was being used in the surface erosion model, or whether it was a modeled road used for the surface erosion modeling. For example, within Appendix C the DEIS states, "*Unless otherwise known, the default ditch length was 200 feet.*", implying at least a portion of the road network was synthesized.

The concluding remarks of this subsection of the DEIS (page 204) are misleading. First, Chart 3-74, shows background sediment levels of ~2 x 10^6 tons per mile per year. That is 2 million tons per stream mile per year. I used the stream length in Table 3-26, 2,777 miles of stream divided by square miles of WDNR managed lands 421.875 (270,000 acres/640) to determine stream density. The stream density is therefore approximately 6.58 miles/sq. miles. Multiplying the ~2 million tons/stream mile/year times stream density yields an estimated background sediment rate of 13.16 x 10^6, or 13.16 million tons per square mile per year. This is the same as 4.612 x 10^6 metric tons per square km. Assuming a specific gravity of soil of 1.6, this equates to a 2.89 meter annual erosion rate across the OESF. If that were right, the surface of the entire OESF would need to be lowered by 2.89 meters annually. At a specific gravity of 2.67 (approximate average for the earths crust[Robinson and Coruh 1988]), the surface of the entire OESF would need to be lowered by 1.73 meters annually. The background erosion rate is absurdly high and needs to be recalculated.

It is unclear based on the written description in the main body of the DEIS and Appendix C what basic erosion rates were used in the WARSEM model. If you are going to compare road versus background rates then the "basic erosion rate" within the WARSEM model needs to be adjusted or calibrated from the default. Another confusing portion of the modeling comes from the text on page 68 of Appendix C, which states, "*During active*

haul, roads were assumed to be maintained to new road standards and monitored for water quality. Therefore the delivery estimates from the WARSEM model were constrained to less than 10 tons per stream mile within each sub-watershed (CMER 2010)".

The DEIS (page 203) states, "*While the total road and traffic sediment inputs in a number of Type 3 watersheds exceed the "high" delivery class threshold of ten tons per stream mile per year, the rate of sediment input is relatively low compared to the background levels."* These conclusions are misleading for reasons mentioned above. I recommend re-modeling and re-writing the entire soils section for sediment delivery from roads.

In addition, as the DEIS is currently written and modeled it depicts an increasing trend in road related sedimentation (see Charts 3-73 and 3-74). It is unclear how increasing road related surface erosion from current levels complies with either the WDNR HCP or the FPHCP. In fact, the Incidental Take Permit (NMFS 1999) clearly states, "*The extent of take associated with road impacts is difficult to quantify but is expected to gradually lessen in severity and frequency as older roads are upgraded and new roads are better constructed and maintained."*

Chapter 3 - Fish

Current Conditions for Fish

The DEIS (page 221) states, "*In general, freshwater environments in the OESF have been less affected by humans than elsewhere in the Pacific Northwest.*" This is speculative but presented as a fact. A citation or analysis is needed in order to make such a statement.

What is the current status of salmonids?

The DEIS does not use the best available science to evaluate the current status of stocks across the OESF. For example, Table 3-60 depicts the status of Lake Ozette sockeye salmon as unknown based on SaSI (WDFW 2002). However, numerous others have concluded the status was either critical or depressed (Nehlson et al. 1991; McHenry et al. 1996; Gustafson et al. 1997; Good et al. 2003; Haggerty et al. 2009). On March 25, 1999, NMFS listed Lake Ozette sockeye salmon as threatened under the Endangered Species Act (64 FR 14528). The threatened status under the ESA was reaffirmed in 2005 (70 FR 37160).

This is just one example of where the best available science was not used in this portion of the assessment. The DEIS does not include either the Pysht and Sekiu river chinook stocks, both of which are considered critical in other assessments (NOPLE 2004). The DEIS includes 4 WRIA 19 coho stocks within the OESF and all are listed as healthy. The NOPLE (2004) analysis identified a total of eight WRIA 19 coho stocks and determined that seven were depressed and one was critical. The NOPLE (2004) analysis included seven steelhead stocks, five were classified as depressed and two were classified as healthy. The NOPLE (2004) analysis identified a total of eight WRIA 19 chum stocks and determined that two were depressed and six were critical.

The information presented in the DEIS is not the best available science and does not represent the consensus opinion of fisheries scientists on the Olympic Peninsula. This section should be re-written.

What are the Indicators for Fish?

This portion of the assessment has several material flaws. Generally speaking these flaws result in part from the initial channel sensitivity analysis, which was flawed based on the methods and scale of the assessment. Below I have included a few examples of how the entire process results in illogical harvest management planning.

The Charley Creek sub-basin (T-3 basin 138) has very high coho salmon spawning densities, averaging close to 400 adult spawners per mile (1998; 2000-2005 [unpublished WDFW spawning ground survey data]). For example, the 1.38 miles of mainstem channel makes up approximately 4% of the known spawning habitat within the WAU but provides habitat for 17% of the coho spawning population (1998; 2000-2005 [unpublished WDFW and Tribal spawning ground survey data]. Charley Creek is well known among fish biologists as one of the most productive salmon spawning streams on the Olympic Peninsula.

The channel sensitivity analysis for this sub-basin rated low (1.49) for fine sediment despite the fact that the principal fish habitat is low gradient and unconfined. All other channel sensitivities were rated as moderate. Any other channel assessment would have determined that all input sensitivities were high for this 1.38 mile reach of Type 2 stream. Within the context of watershed analysis if the channel assessment leader would have assigned moderate ratings for the other input variables (e.g., coarse sediment, LWD) they would have been over-ridden the fish habitat analyst.

Within this subbasin the No Action Alternative contained no clearcut harvesting within 150, 250, and 300 feet of type 4, 3, and 1/2 streams respectively. There were 14.5 acres of buffer along the mainstem (T2) within the 100-150 ft zone, the Landscape Alternative proposes clear-cut harvesting 21% of this zone. The total buffer width is less than the windthrow buffer of 150 feet. There are 117 acres of exterior buffer within this T3 subbasin, the Landscape Alternative plans to clearcut 93 acres of exterior buffer during the life of the plan.

What is equally alarming is that there is a disproportionate amount of clearcut logging in the riparian zone within the Charley Creek watershed (T-3 IDs 138, 139, 150, 157, and 158). Within the Clallam WAU the DEIS analyzed 1,973 acres of interior and exterior buffers, 37% is contained within the Charley Creek watershed. Nearly 70% of all exterior buffer acres are proposed for clearcutting under the Landscape Alternative are within the Charley Creek watershed.

This is just one example of how the plan does not take into account fish and important fish habitat. Appendix F includes numerous examples poor riparian clearcut harvest practices proposed in the Landscape Alternative as compared to the No Action Alternative. Within the Hoko Watershed where the status of all salmon species is depressed or critical (NOPLE 2004) the Landscape Alternative plans to clearcut harvest over 200 acres (19%) of interior core buffer and 1,134 acres of exterior buffer (100% of analyzed acreage). Figure 3 depicts the acreage of interior and exterior riparian areas in the Clallam and Hoko WAUs contrasted with the acreage of clearcut harvesting proposed in the two alternatives.

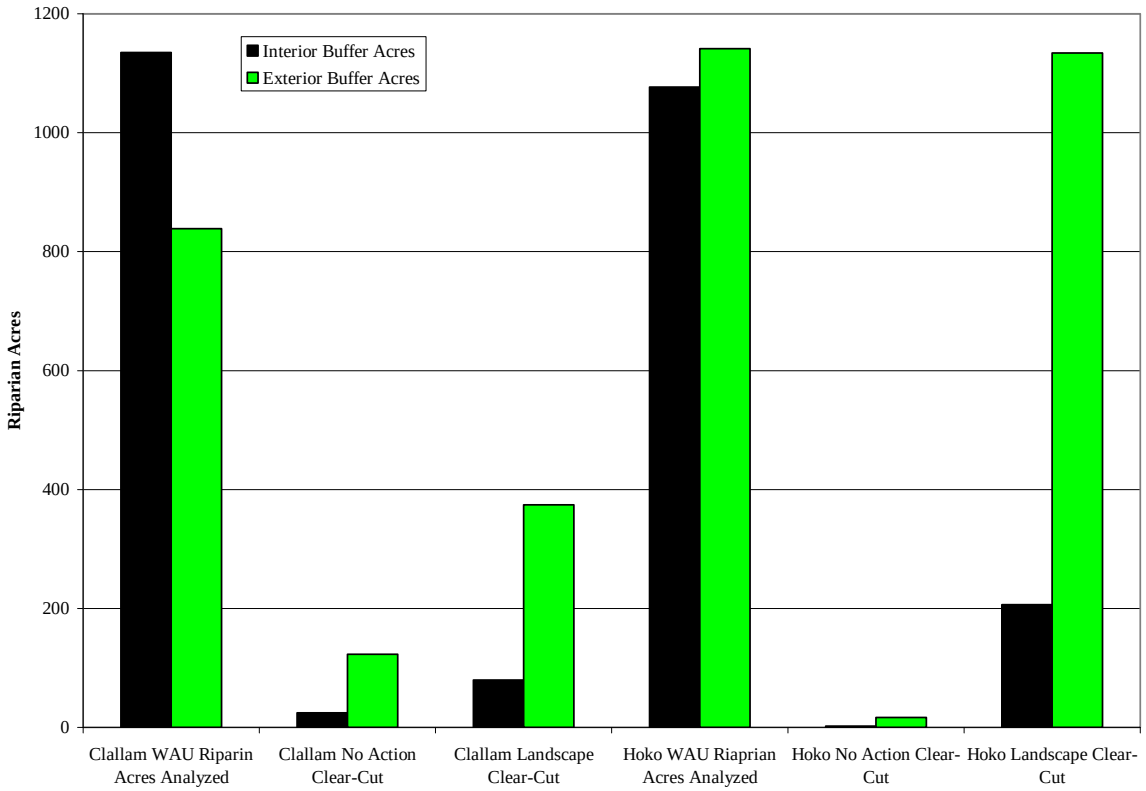

Figure 3. Comparison of Clallam and Hoko WAUs interior and exterior buffer areas analyzed and clearcut acres by zone (source: calculated from outputs in Appendix F5 and F8).

Due to time constraints and the complexity of the data I could not conduct further analysis of the riparian clearcut harvesting within the OESF. I did review the outputs for the Lake Ozette watershed where the only listed salmon species is present. I focused my analysis on key sockeye habitats (Umbrella Creek and Olson's Beach). Siwash Creek is the closest tributary with significant sediment inputs into the lake. This stream is very close to one of the last two remaining sockeye spawning aggregations (Haggerty et al. 2009). The Lake Ozette Sockeye Recovery plan classifies this area as priority 1 and 2 habitat (NMFS 2009). The Landscape Alternative proposes to clearcut harvest 9% of the interior buffer and 60% of the exterior buffer in these key subbasins (source: data analysis of Appendix F19 T3 IDs 174, 192, and 354).

This proposed level of timber harvest does not appear to meet the requirements established in the Incidental Take Permit (ITP; [NMFS 1999]). For example, in T-3 ID 192 (lower Siwash Creek) the Landscape alternative analyzed 43.9 acres of interior buffer (within 150 feet of T1/2 streams and within 100 feet of T3/4 streams) and proposes to clearcut harvest 22% of the acreage. The DEIS also analyzed 51.7 acres of exterior wind buffer and proposes to clearcut 62.4 acres within this zone (apparently multiple entries are included into the exterior zone).

The ITP (NMFS 1999) defines the riparian conservation strategy as a riparian management zone consisting of an inner riparian buffer and an outer wind buffer where needed (e.g., within the OESF). The ITP defines the principal function of the inner riparian buffer as protection of salmonid habitat and the principal function of the exterior buffer as protection of the inner riparian buffer. The ITP further states that all fish bearing streams(Type 1 through 3) will receive a conservatively managed inner buffer equal in width (measured horizontally from the 100-year floodplain) to a site potential tree height (derived from 100- year site-index curves) or 100 feet, whichever is greater. The ITP suggests that this will result in average inner-buffer width of between 150 and 160 feet. Type 4 streams will receive a 100-foot inner-buffer. The permit states that little commercial timber harvest would occur within the 25 to 100 foot zone, and slightly more tree removal could occur outside of 100 feet (this implies no commercial clearcut harvesting within the inner buffer). The ITP further states that the above riparian protections represent the minimum level of riparian conservation that WDNR is committed to implement.

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BULL TROUT

Shelley Spalding

This review of the Olympic Experimental State Forest (OESF) HCP Planning Unit Forest Land Plan Draft EIS (DEIS) is provided on behalf of the Olympic Forest Coalition. The review will analyze impacts to bull trout for both the No Action Alternative (NAA) and the Landscape Alternative (LA). Other papers in this review of the OESF DEIS describe impacts to the riparian area; this paper will highlight bull trout sensitivity to some of those impacts.

Bull trout were listed by the U.S. Fish and Wildlife Service (USFWS) in 1999 as a threatened species throughout their range in the United States. In anticipation of that listing, in 1998 USFWS reinitiated the Biological Opinion and Conference Opinion on the Washington State Department of Natural Resources (DNR) Habitat Conservation Plan (HCP) to include an analysis of potential impacts to bull trout from activities covered by the HCP. This document specifically describes the protections required in the OESF on pages 4 and 5. These protections do not appear to be included in the Draft Landscape Plan for the OESF for the specified stream types. The DEIS makes no mention of bull trout being a listed species nor does it refer to a conservation strategy for the fish as it does for other ESA listed species such as marbled murrelets and spotted owls. Bull trout are found in streams throughout the OESF, including Cedar, Mosquito, Goodman, Matheny, and Kalaloch Creeks as well as the Hoh, Calawah, and Queets Rivers.

Bull trout have more specific habitat requirements than most other salmonids, which limits their distribution within any particular watershed (Rieman and McIntyre 1993). Because of this limited distribution, bull trout may be at a relatively greater risk of extinction than other salmonids occupying the same watershed. Habitat components that influence bull trout distribution and abundance include water temperature, cover, channel form and stability, valley form, spawning and rearing substrate, and migratory corridors (Goetz 1989; Howell and Buchanan 1992; Rieman and McIntyre 1993, 1995).

The current harvest level in the OESF is 57 million board feet (MMBF)/year; the No Action Alternative (NAA) proposes an increase to 65MMBF/year; and the Landscape Alternative (LA) proposes to almost double the current level to 80 – 100 MMBF/year. The DEIS proposes to achieve the increased harvests largely through differences in application of the riparian conservation strategy. Forest management activities, especially when conducted in riparian areas, affect stream habitats by altering recruitment of large woody debris, erosion and sediment rates, runoff patterns, the magnitude of peak and low flows, water temperature and water yield. The DEIS states that “nearly every Type 3 watershed is projected to experience detectable impacts to at least one indicator under the Landscape Alternative (97 percent) of the Type 3 watersheds; and to a lesser degree, under the No Action Alternative (77 percent) (DEIS, p. 9, 170).

Water temperature is consistently recognized by researchers more than any other factor as influencing bull trout distribution (Rieman and McIntyre 1993; Thurow 1997; Goetz 1989). Bull trout are believed to be among the most temperature sensitive cold-water species found in western North America (Dunham et al. 2003). Water temperature is an especially important factor in determining survival in the early life history of bull trout, with very cold water temperatures resulting in higher egg survival and faster growth rates for fry and

juveniles (McPhail and Murray 1979). Water temperatures above 15 degrees Celsius are believed to limit bull trout distribution, a limitation that may partially explain the patchy distribution of bull trout within a watershed (Rieman and McIntyre 1995; Dunham et al. 2003). When canopy cover is removed water temperatures exceeding the tolerance of bull trout may result, especially in low elevation streams during the summer (MBTSG 1998). Both DEIS alternatives are predicted to impact stream shade (NA ten percent; LA 33 percent), with additional impacts to peak flows and microclimate under the two alternatives. These impacts are likely to result in elevated stream temperatures for varying periods of time following the planned harvest in the riparian zones under both alternatives.

All life history stages of bull trout are associated with complex forms of cover, including large woody debris (LWD), undercut banks, boulders and pools. LWD helps form pools, regulates sediments and creates complex habitat. Several life-history features of bull trout make them particularly sensitive to activities that reduce the quantity, quality, and distribution of large wood that directly or indirectly affects stream-channel integrity and natural flow patterns (MBTSG 1998). These life history features include

- Extensive spawning and overwintering migrations of adult bull trout, which require a large network of suitable freshwater habitat with migratory corridors;
- Use of deep pools by both adults and juveniles for cover and thermal refuge;
- Selection of redd sites by adults in low-gradient reaches and in areas of hyporheic or groundwater influence - these lower-gradient sites with hyporheic influence are often located adjacent to channel roughness elements (LWD and boulders) within stream reaches having overall moderate to steep grades.

Removal of riparian trees reduces stream habitat complexity by decreasing the amount of large woody debris available for recruitment to the stream.

Bull trout survival and abundance are negatively affected by increased sedimentation in streams. Bull trout eggs have a long incubation period (up to 220 days before fry emerge) and are susceptible to smothering and crushing bedload movement associated with increased sedimentation. Juvenile bull trout rely upon the substrate for cover and there is a strong association of juvenile bull trout with streambed cobble and substrates low in fine sediments (Thurow 1997). Adult bull trout are an apex predator and elevated sediment levels affecting light levels likely impact the success of their visual detection of prey species (Mazur and Beauchamp 2003). The DEIS acknowledges that numerous sub-watersheds have potential road sediment impacts that exceed the "high" delivery class of 10 tons per stream mile per year.

The OESF DEIS describes only two alternatives, and both include harvest within the riparian zone. There are no quantitative criteria for harvest in the riparian zone with which to assess the potential effects of these management activities on bull trout. In general, the most serious effects of timber harvest in riparian areas on bull trout and their habitat include increased summer water temperatures resulting from canopy and shading vegetation removal; reduced large woody debris recruitment due to removal of source trees; and reduced pool and substrate quality caused by increased sediment delivery.

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LARGE WOODY DEBRIS

Shelley Spalding

This review of the Olympic Experimental State Forest (OESF) HCP Planning Unit Forest Land Plan Draft EIS (DEIS) is provided on behalf of the Olympic Forest Coalition. The review will analyze likely impacts to large woody debris (LWD) for both the No Action Alternative (NAA) and the Landscape Alternative (LA).

General

The DEIS is vague, contradictory, and, in some cases, misleading. As described in the OESF DEIS, implementation of the riparian strategy in the OESF will require watershed assessment, numerous assumptions, a great deal of averaging, and complex modeling. This complexity makes it difficult to analyze the DEIS and the impacts to our state forests and adjacent streams. For example, when discussing effects of management in riparian areas, the DEIS states, "For the purposes of this analysis, a net ***potential*** impact in excess of ten percent of the ***theoretical*** maximum was used as a measure of a ***probable***, significant, adverse, environmental impact (emphasis added)" (DEIS, p. 169). Even with all this uncertainty there is no description of validation monitoring that has occurred or is planned for the models.

"Averaging" reflects neither the range of impacts nor the frequency at different ranges and can be misleading, as with the net potential impact (NPI) analysis (the sum of the modeled potential effects or consequences for a given indicator). For example, in the Middle Hoh impact analysis there are several decades with potential impacts for a single indicator that range from 20 to 26 percent yet because there are more decades with zero percent impacts (likely because there is no harvest activity), the NPI for the nine decades analyzed is only 6 percent. Because NPI in excess of ten percent is the theoretical and arbitrary measure of "probable, significant, adverse, environmental impact", this threshold is reached much less frequently than if, when planning for management activities (timber harvest), the impact for an indicator were measured and evaluated for each decade and displayed as the number of decades in which there adverse impacts were likely to occur. (DEIS, p. 142-3)

Large Woody Debris

The first of DNR's three measurable objectives for managing the state trust lands in the OESF addresses LWD:

> To protect, maintain, and aid natural restoration of riparian systems on DNR-managed lands in the OESF by maintaining and increasing the recruitment potential for large woody debris and shade associated with riparian systems and avoiding detectable levels of peak flows.

Reduction of wood in stream channels, either from present or past activities, generally reduces pool frequency and quality, and channel complexity (Spence et al. 1996). Large wood in streams enhances the quality of habitat for salmonids and contributes to channel stability (Bisson et al. 1987). It creates pools and undercut banks, deflects streamflow, retains sediment, stabilizes the stream channel, increases hydraulic complexity, and improves feeding opportunities. By forming pools and retaining sediment, large wood also helps maintain water levels in small streams during periods of low streamflow. Large pools consisting of a wide range of water

depths, velocities, substrates, and cover are characteristic of high quality aquatic habitat and an important component of channel complexity.

Current condition of large wood in stream channels and riparian areas

Historically Sitka spruce, western red cedar, western hemlock, and Douglas fir dominated the riparian areas adjacent to streams in the OESF (WSCC 2000, 2001). Hardwoods were also present but in smaller quantities than under current conditions. In the past century, logging activity has reduced the size and number of conifers in the riparian area. While hardwoods can provide structure to streams, the key pieces tend to be smaller and prone to more rapid deterioration.

There is little field data available on the current condition of large wood in streams in the OESF, and for this reason DNR used a combination of remotely sensed assessments of channel geomorphology and field-based assessments of current channel conditions to determine the relative sensitivity of streams to large woody debris. Chart 3-63 displays large woody debris sensitivity ratings based on gradient and an arbitrary score for sensitivity to LWD from one to three. High gradient streams were given the lowest rating. This does not reflect nor measure the critically important role that LWD plays in the higher gradient streams. Although LWD may not provide as much channel forming input in those streams as in low gradient streams, it is extremely important to biological integrity of the stream, primarily for the aquatic organism that rely upon sediment storing, pool forming and refuge providing properties of LWD. LWD recruited to the higher gradient streams is an important source for LWD in lower gradient streams and steeper, more highly dissected watersheds will likely have a greater proportion of wood coming from upslope than will watersheds with lower gradients.(Reeves 2006).

The DEIS states that the current riparian conditions form the baseline for management activities required "to aid natural restoration of riparian systems on DNR-managed lands in the OESF" (DEIS, p. 22). However, there is no description of how DNR conducted the field-based assessment of the current condition of LWD in streams nor what criteria was used for LWD. With entry into riparian areas for harvest under both alternatives, the potential for decreased LWD recruitment is high.

LWD source distance and location

Research into wood recruitment from streamside adjacent areas has helped shape the recruitment-distance relationships for wood from this source. Many of these examinations of wood sources have focused on input from the immediately adjacent riparian zone (McDade and others 1990 Beschta and others 1987). These studies concluded that most of the wood found in the streams originated within about 100 feet of the channel. The studies did not consider episodic sources of large wood from disturbance events such as landslides, debris flows, and fire or did not study reaches influenced by upslope sources. "The assumption that all wood came from within 100 feet of the channel based in the studies is incorrect, and the potential effectiveness of plans and policies based on it are questionable (Reeves 2006)." The DEIS bases its modeling rule for LWD on the recruitment potential within 100 feet of a stream. This short-sighted recruitment potential model does not support the stated objective to "aid the natural restoration of riparian systems" and may actually perpetuate the degraded or poor condition of many stream and river ecosystems within the OESF area.

Due to its steep terrain, structurally weak parent materials, and abundant rainfall, the OESF is predisposed to mass wasting (p.189). In this type of terrain naturally occurring landslides and debris flows can be important mechanisms for delivering wood from hillslopes and small headwater channels to valley bottoms (Reeves 2006). In a study by Benda and others (2002) more than 80 percent of the total number of pieces of wood in a western Washington stream were from upslope sources. Debris flows without wood are more likely to consist of a slurry of sediments that are fast moving and can scour streams over a long distance. These types of flows are likely to have more detrimental effect on fish bearing streams than to have the potential favorable effects of debris flows with wood.

Riparian Harvest impacts on LWD recruitment

According to the DEIS analysis, across the OESF channel sensitivity is highest for large woody debris input. This sensitivity rating coupled with the current low recruitment potential for large conifers in many riparian stands underscores the importance of increasing retention of large conifers to the maximum potential in the riparian areas of all streams, including Type 5 streams, whether the trees are adjacent to high, moderate or low gradient streams. The type, size and distribution of large trees in riparian and upslope areas influences the condition of the aquatic ecosystem; generally, the bigger and more numerous the conifers, the better the condition of the watershed (Reeves 2006). If there were no harvest in the riparian area, or at the very least the rule for harvesting in riparian areas was limited "harvesting from below" (smaller trees harvested, largest left), there would be greater support for the statement in the DEIS that "the general trend in the potential for large woody debris is positive over time under both alternatives, indicating an increase in the potential for large woody debris input" (DEIS, p. 57).

The modeling rule for assessment or riparian forest conditions for LWD states that "recruitment potential within 100 ft of a stream in each Type 3 watershed cannot decline from its current or improved state over time. Any timber harvest that reduces the potential is prevented using this 'non-declining' modeling rule" (DEIS p. 50). A non-declining modeling rule based on "current state" does not meet the above stated objective of aiding restoration. This rule also does not address the contribution of upslope and headwater streams to LWD recruitment in fish bearing streams.

Removal of trees from the riparian area results in reduction of large woody debris in the stream channel. The OESF objective of "maintaining and increasing the recruitment potential for large, woody debris…associated with riparian systems" will be seriously compromised if large trees, those that create key pieces of wood in debris jams, are not left in the riparian areas of all streams, Type 1 through 5). And downed wood in riparian areas, those pieces that do not make it to the stream, can impede movement of finer sediments into streams and thus prevent them from reaching streams where they can affect fish and their habitat. Attempting to manage the riparian area on the "razor's edge" of a "modeled" large woody debris recruitment level with little knowledge of baseline conditions, does not account for the dynamic nature of the aquatic ecosystem.

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HEADWATER STREAMS AND TYPE 5 WATERS

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Background

In March 2009 the Conservation Caucus submitted comments to the Washington Department of Natural Resources (DNR) on their proposed Headwaters Conservation Strategy (HCS) in response to a presentation given by Richard Bigley and Jeff Ricklefs (DNR employees) in Seattle Washington, February 2009. Although the DNR has not implemented their HCS, many of the CC's chief concerns and comments are directly applicable to the Olympic Experimental State Forest (OESF) and all other WDNR state lands covered under their Habitat Conservation Plan (1996).

Attached in Appendix 2 are the CC's comments to DNR's HCS directed to Tamara Miketa and Richard Bigley (March 2009) along with DNR's response to those comments submitted by Tamara Miketa (January 2010). See Appendix 2. Regrettably, it took DNR ten months to respond to the CC's comments, most of which were not adequately addressed of simply excused as inconsequential or invalid.

There are three core concerns that remain unresolved by DNR and the CC that are directly applicable to management of the OESF and other State lands covered under the HCP (1996); 1) the inaccuracy of DNR's hydro layer for determining water type (1,2,3,4,5, and 9), 2) the requirement that DNR provide accurate and complete mapping of all waters prior to approving forest practice permits, and 3) the failure of DNR to enforce and comply with the physical criteria for determining Type 4 and Type 5 waters outlined in their HCP (1996), and consequently, has not provided adequate buffer protections.

Lastly, the CC has requested on multiple occasions over the past 15 months that DNR provide the channel width data from the streams included in both their compliance monitoring program and the "Retrospective Analysis" on Type 5 waters. We have yet to receive anything from DNR.

Type 4 Waters and Type 5 Waters not Accurately Typed or Protected by DNR

During DNR's presentation to the CC in February 2009 on their HCS they presented the results from a "Retrospective Analysis" on Type 5 waters (Richard Bigley). During the presentation, it became immediately apparent to the CC that many of the streams in DNR's PowerPoint presentation appeared to meet the physical criteria for Type 4 waters, not Type 5 waters. When asked, DNR admitted that many of the streams were in fact Type 4 waters which raised the question; why were they included in a Type 5 Study and not buffered according to the HCP (Type 4 waters require 100 ft. buffers, Type 5 waters may be clearcut)? The CC was informed by DNR staff that DNR's Type 5 Retrospective Study was less concerned about compliance with the rules governing their HCP and more concerned about how streams perceived as Type 5 waters by DNR foresters, incorrectly typed or not, were responding to Type 5 harvest treatments.

The seminal reason that accurate water typing is of major concern for aquatic conservation purposes to the CC is that Type 4 waters are required to be fully buffered (100 ft. per side) under the DNR State Lands HCP, whereas Type 5 waters may be clearcut. This large discrepancy in riparian protection between Type 4 waters and Type 5 waters has broad implications for the

adequacy of habitat conservation measures if water typing is not accurately enforced and validated prior to approving forest practice permits.

The DNR State Lands HCP defines Type 4 waters as,
"*Type 4: Segments of natural waters which are not Type 1,2, or 3, and for the purpose of protecting water quality downstream are classified as Type 4 water upstream until the channel width becomes less than 2 feet in width between the ordinary high-water marks (*emphasis added)*. These may be perennial or intermittent.*"

The DNR State Lands HCP defines Type 5 waters as,

"*Type 5: Natural waters which are not Type 1,2,3, or 4; including streams with or without well-defined channels, areas of perennial or intermittent seepage, ponds, natural sinks and drainage ways having short periods of spring or storm runoff.*"

As stated above, after DNR's PowerPoint presentation in Seattle (2009) the CC has requested channel width data from DNR staff on multiple occasions over the past 15 months, but has yet to receive anything. Based on that presentation (2009), DNR's Retrospective Study collected a myriad of other channel profile data (e.g., channel gradient, channel substrate composition, channel depth, pool frequency, etc.) so field crews must have also collected channel width data, particularly since they were by definition conducting a "Type 5" study. Most importantly, DNR staff's response to our concerns about inaccurate water typing under the State Lands HCP have been predominantly met with opposition, false assumptions, citations taken out of context, and arbitrary statements.

Below is DNR staff 's response to our questions concerning inaccurate water typing as taken from DNR's Memorandum from Tami Miketa (January 2010). The bold print is the CC's statement, and the italics is DNR staff's response.

e) Accurate and complete mapping of water is required for forest practices – applications can and should be rejected if all the water isn't accurately mapped.

We agree that all streams and wetlands should be accurately typed and mapped within a forest practice unit. It is documented within our HCP and forest practices rules that water resource typing will be field verified. However, we cannot address the approval process for forest practices applications. This issue should be addressed with Forest Practices.

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B. Some stream types that are assumed to be Type 5 are actually Type 4 in the retrospective study.

It should be noted that differentiating a Type 4 from a Type 5 stream based on channel width is often difficult and may change over time through natural processes and disturbance. Implementation monitoring conducted sometimes years after the fact is at a distinct disadvantage when comparing with previous determinations. We are unable to comment on the role that natural stream dynamics or logging disturbance played in altering the Ordinary High Watermark (OHWM) width and thus the stream typing of specific Type 5 streams determined to be mistyped post harvest.

Under e), DNR staff clearly state that "*It is documented within our HCP and forest practices rules that water resource typing will be field verified*" before deferring to the Forest Practices Division. In any case, since DNR is required to field verify their hydro-layer for water typing inaccuracies they must have channel width data recorded and archived somewhere as that is the defining criteria for determining the difference between Type 4 waters and Type 5 waters clearly stated in their HCP as cited above.

Most disturbing however, is DNR staff's later statement under B. which attempts to excuse (through "*natural stream dynamics or logging disturbance*") any channels that are found to be Type 4 waters by meeting the physical criteria outlined in the HCP of having a channel width greater than 2 ft. wide at the ordinary high water mark, but were incorrectly typed and approved by DNR previously (pre-harvest) as Type 5 waters. Unless DNR has evidence, via research and monitoring results, indicating that channel widths have in fact changed from pre to post harvest in response to "logging disturbance" or any other "factor", one cannot assume otherwise.

By definition a "retrospective" study would have no pre-harvest data, nor would compliance monitoring, so while it may be convenient to explain away any discrepancies found by mistakenly calling channels that are greater than 2 ft. wide (Type 4 waters) Type 5 waters when field verifying water types, it is scientifically indefensible. Such conclusion could only be generated from a BACI type study (Before-After-Control-Impact) which controls for and measures potential responses to channel conditions from harvest practices. DNR staff's statements to the contrary are indicative of a complete lack of understanding of how research and monitoring results must first generated BEFORE being potentially being used as "causal" to changes in response to forest practices or other "treatments".

In this regard, DNR staff's statements present a contradiction by first stating that under the State lands HCP, DNR is required to first field verify all water typing on their lands, but then claiming that it is next to impossible to do so because some potentially unknown factor may have changed the channel width without providing a shred of evidence (e.g., research and monitoring results) to support such claims. As cited above, the DNR State Lands HCP is very clear on defining the difference between Type 4 waters which require 100 ft. riparian buffers, and Type 5 waters which may be clearcut, without exception for potential impacts to channel conditions in the absence of monitoring results and without scientific merit.

Water Typing and Modeled Stream Densities in the OESF

I examined two versions of the DEIS for the OESF with tables (3-xx, later called version 3-26) for modeled stream densities, one dated October 2009 and the other June 2010, and compared the differences in Type 4 and Type 5 waters. Both tables indicate that the vast majority of channels by WAU in the OESF in DNR's hydro-layer are labeled as Type 5 waters. The DNR hydro-layer was largely generated and updated from a CMER (Cooperative Monitoring Evaluation and Research) committee study that attempted to model the extent of fish habitat (Fish Habitat Model Validation Study, CMER 2005). The Fish Habitat Model has four main variables that were used to "calibrate" the model for accuracy; channel gradient, precipitation, basin area, and elevation. Channel gradient was determined using a 10m DEM (Digital Elevation Model) which proved to be too course and inaccurate for the Washington Forest Practices Board to adopt as rule under the WA Forest Practices HCP. One of the main shortcomings of using a 10m DEM for generating channel gradients is the inability of the model to "see" more subtle changes in topography often encountered

in the Puget Sound lowlands and the foothills surrounding the Olympic Mountains. Some of these shortcoming are highlighted in the DEIS for the OESF from 2009.

Table 3-xx in DEIS from 2009 shows the vast majority of channels in the OESF WAUs as Type 5 waters. However, the authors also point out several key problems with the DNR GIS hydro-layer and the inaccuracies inherent in mapping Typed waters using a 10m DEM.

Table 3-xx. Stream length by state lands water type within selected watershed. Data presented descending by total miles on DNR-managed lands within each watershed.

Comment [jric4902 modification. See above

Watershed	Stream length by state lands water type										Total
	Type 1 mi (%)		Type 2 mi (%)		Type 3 mi (%)		Type 4 mi (%)		Type 5 mi (%)		Type 9 mi (%)		mi
Upper Clearwater	75.1	(10%)	3.1	(0%)	76.5	(11%)	55.4	(8%)	511.7	(70%)	6.2	(1%)	727.9
Middle Hoh	36.1	(7%)	9.0	(2%)	76.2	(15%)	155.0	(31%)	225.5	(45%)	4.1	(1%)	505.9
Lower Clearwater	16.8	(6%)	4.5	(2%)	36.4	(12%)	25.7	(9%)	215.7	(72%)	1.0	(0%)	300.0
Goodman-Mosquito	9.5	(6%)	3.4	(2%)	25.0	(16%)	16.5	(11%)	100.4	(64%)	1.0	(1%)	155.7
Sol Duc Valley	20.2	(13%)	3.7	(2%)	39.1	(26%)	21.9	(14%)	62.5	(41%)	5.3	(3%)	152.7
Bogachiel	3.8	(3%)	4.8	(3%)	42.4	(29%)	8.5	(6%)	85.3	(59%)	0.2	(0%)	144.9
EF Dickey	11.5	(8%)	13.7	(10%)	32.6	(23%)	21.5	(15%)	59.1	(42%)	3.0	(2%)	141.4
Hoko	4.5	(3%)	0.5	(0%)	29.8	(23%)	17.7	(14%)	77.2	(59%)	0.5	(0%)	130.1
Lower Dickey	2.1	(2%)	7.6	(7%)	30.2	(26%)	12.6	(11%)	62.3	(53%)	2.3	(2%)	117.1
Kalaloch Ridge	2.9	(3%)	0.4	(0%)	9.3	(9%)	7.0	(7%)	78.0	(79%)	1.0	(1%)	98.7
Clallam River	4.6	(5%)	4.2	(4%)	21.7	(22%)	10.3	(11%)	56.7	(58%)	0.1	(0%)	97.5
Lower Hoh River	6.5	(7%)	5.2	(6%)	27.9	(30%)	21.0	(22%)	30.9	(33%)	2.0	(2%)	93.7
Lower Queets River	0.0	(0%)	7.4	(10%)	23.8	(32%)	9.4	(12%)	33.3	(44%)	1.6	(2%)	75.5
Quillayute River	0.9	(1%)	0.8	(1%)	21.8	(30%)	10.4	(14%)	38.1	(52%)	1.4	(2%)	73.4
Cedar	0.0	(0%)	1.8	(3%)	10.1	(16%)	10.0	(16%)	39.2	(63%)	1.1	(2%)	62.2
Sol Duc Lowlands	5.2	(12%)	0.5	(1%)	9.9	(23%)	7.7	(18%)	19.9	(46%)	0.4	(1%)	43.6
Twin Rivers-Deep Creek	0.6	(14%)	0.6	(15%)	0.8	(20%)	0.6	(16%)	1.3	(32%)	0.1	(4%)	4.1

There are two known sources of error in the GIS database which reduce the level of confidence in these statistics. The first pertains to streams and other water bodies not included in the database due to omissions or inaccurate mapping. Current field inventories in selected areas indicate that numerous streams and wetlands are missing. An unpublished study examining the extent of headwater systems on DNR-managed trust lands in western Washington found that approximately half of all headwater streams are not mapped on existing data sources (Ricklefs, DNR, Olympia, WA, personal communication 2009). The second problem relates to inaccurately typed streams, most of which are Type 4 and 5 waters that should be upgraded. The number of unmapped Type 5 waters excluded from the GIS database, however, partially offsets the number of incorrectly typed streams. Realistically, Type 5 waters probably constitute about 40 percent of actual stream miles on the Experimental forest. DNR is presently working on correcting GIS database errors.

Most notable is the authors statement that "*The second problem relates to the inaccurately typed streams, most of which are Type 4 and 5 waters that should be upgraded*"(emphasis added). The research that CMER conducted on the DNR hydro layer under the Fish Habitat Model Validation Study (CMER 2005) also found mistyped 4 and 5 waters that needed to be "upgraded" west of the Cascade Mountains due to model inaccuracies related to using a 10 m DEM. Interestingly, on the eastside of the Cascade Mountains the Fish Habitat Model inaccurately placed many streams in colluvial valleys with no defined channel.

The latest version (June 2010) of the DIES OESF makes slight changes to Table 3-xx, now Table 3-26. What hasn't changed is that the vast majority (62%) of watershed/ WAU headwater stream length consists of what

DNR's hydro-layer is depicting as Type 5 waters. It is unknown, or at least not documented in the DEIS, what changes were made, if any, to DNR's hydro-layer resulting in their Type 5 water total stream length estimate changing from "*40 percent*" above, to 62% below (Table 3-26). The DEIS OESF (June 2010) states,

"An abundance of low-order (Type 4 and 5) waters result from the terrain characteristics and precipitation regimes of the western Olympic Peninsula. Steep, erodible terrain and heavy annual precipitation (Chart 3-1) promotes high stream densities, particularly in U-shaped glacial valleys like the Hoh, Bogachiel, and Sol Duc drainages. Current GIS information indicates that the average stream densities in the OESF are 0.33 mi/mi[2] for Type 1 waters, 0.12 mi/mi[2] for Type 2 waters, 1.06 mi/mi[2] for Type 3 waters, 0.92 mi/mi[2] for Type 4 waters, 4.07 mi/mi[2] for Type 5 waters, and 0.08 mi/mi[2] for Type 9 (unclassified) waters."

Table 3-26. Stream Length (miles) within Selected Watershed Administrative Units on DNR-Managed Lands

	Stream Length (miles) by Water Type						
Watershed Administrative Unit	Type 1	Type 2	Type 3	Type 4	Type 5	Type 9	Total
Bogachiel	2	4	42	8	79	0	135
Cedar	0	2	10	8	35	1	56
Clallam River	5	4	20	9	54	0	92
East Fork Dickey	7	4	16	14	40	1	82
Goodman Mosquito	9	2	22	16	98	1	149
Hoko	2	0	22	15	67	0	107
Kalaloch Ridge	3	0	9	7	78	1	98
Lower Clearwater	13	4	34	24	213	1	287
Lower Dickey	1	2	17	8	52	1	81
Lower Hoh River	3	2	22	19	28	2	76
Lower Queets River	0	7	24	9	31	2	73
Middle Hoh	21	8	62	141	212	4	447
Quillayute River	1	1	21	10	36	1	69
Sol Duc Lowlands	1	0	7	5	14	0	28
Sol Duc Valley	5	3	21	14	51	4	98
Twin Rivers Deep Creek	1	1	1	1	1	0	3
Upper Clearwater	47	2	73	53	499	6	681
Total	**138**	**50**	**447**	**389**	**1,720**	**34**	**2,777**

[2] DNR and the Federal Services (U.S. Fish and Wildlife Service, and National Oceanic and Atmospheric Administration Fisheries) have agreed the Washington Forest Practices Board Emergency Rules (stream typing), November 1996 (WAC 222-16-031 [water typing interim]) meet the intent of DNR's 1997 HCP. A comparison of DNR's permanent water typing system is defined in the rules (WAC 222-16-030) and the HCP stream typing system is discussed in Appendix B of DNR (2006b).

[3] The "private" category includes industrial forestland, agricultural lands, and residential, industrial, and commercial lands.

[4] The current DNR GIS stream layer is believed to underestimate the number of Type 5 waters. Mapping standards and methodology vary according to ownership, which result in marked differences in mapped headwater stream density, precluding a direct comparison of stream mileage and density across ownerships.

Footnote 4 located directly above states,
"*The current DNR GIS stream layer is believed to underestimate the number of Type 5 waters. Mapping standards and methodology vary according to ownership, which result in marked differences in mapped headwater stream density, precluding a direct comparison of stream mileage and density across ownerships*."

Again, based on over 15 years experience from personnel with expertise in field validating DNR's hydro-layer, and DNR staff's comments above concerning Type 4 and Type 5 waters needing "upgrading", the Conservation Caucus believes that many of the Type 5 waters in the OESF, and located on all other DNR State HCP lands, meet the physical criteria for Type 4 waters (greater than 2 ft. wide OHWM) and should be buffered accordingly. The above statements by DNR concerning the inadequacy of their hydro-layer to accurately delineate the presence of headwater streams was most recently verified DNR staff (Jeff Ricklefs) in a PowerPoint presentation given to CMER in 2010 (Chris Mendoza, CMER co-chair, personal communication, 2010) titled "*Retrospective Analysis of the Trust Lands HCP Interim Type 5 Conservation Strategy*". We have included the PowerPoint presentation along with our comments for reference.

Briefly, DNR staff's presentation further clarifies the degree to which their hydro-layer, and hence water typing system, grossly underestimates the length of headwater streams by using LiDAR (Light Detection and Ranging) as a remote sensing tool for water typing validation of the existing 10 meter DEM. Slide #18 (of 91) shows the gross differences in resolution between LiDAR and the 10 m DEM. Slides 8,9, and 10 clearly show that not only does DNR's existing hydro-layer grossly underestimate the extent of the channel network located in headwater streams using a 10 m DEM, but it also fails to correctly locate these streams on the landscape. The implications for timber sales and harvest unit layout are also clearly shown in Slide 10 (Jeff Ricklefs, DNR PowerPoint presentation to CMER, 2010).

We applaud the use of LiDAR as a remote sensing tool directed at validating DNR's hydro-layer and water typing system, and completely support DNR staff's (Jeff Ricklefs) "*proposed solution*" (slide 11) to replacing DNR's existing hydro-layer whose widespread inaccuracies stem from the use of a 10 m DEM. Based on the inability of DNR to accurately locate and map the extent of their headwater streams, until LiDAR replaces DNR's existing hydro-layer (based on a 10 m DEM) in the OESF, any and all analyses included in the DIES concerning potential impacts to headwater streams (Type 4 and Type 5 waters) should be rendered invalid and postponed. We encourage DNR to continue mapping ALL forestlands covered under their State Lands HCP (1996) using LiDAR and look forward to participating in their effort to replace the outdated water typing system currently in use in the OESF.

Best Available Science Demarcating Headwater Streams in Washington State

As part of the WA FP HCP Adaptive Management Program for private forestlands, CMER conducted research demarcating Type Np channels (perennial flowing non-fish bearing, equivalent to most DNR Type 4 waters) in Western Washington (Palmquist 2005). The Northwest Indian Fisheries Commission (NWIFC) also conducted research demarcating Type Np channels using the exact same methods as the CMER study (Pleus and Goodman 2003). The NWIFC study focused on eastern Washington with the intention of adding to the distribution of sites covered in the CMER study which focused on western WA. Both studies were subject to Independent Scientific Peer Review (ISPR) at the University of Washington as requested by both CMER and the FP HCP Policy committee who makes recommendation to the WA Forest Practices Board.

Briefly, the results of both studies (Pleus and Goodman 2003, Palmquist 2005) indicated that the default forest practices rules for identifying Type Np waters for both eastern and western Washington were off by nearly tenfold. In response to both of these studies, the Washington Forest Practices Board changed the rules (WAC 222-16-031) governing water typing for forestlands covered in the Washington Forest Practices Habitat Conservation Plan which covers nearly 9 million acres of privately owned forestlands, and some State lands located in eastern Washington. The data from these studies indicates that the majority of the channels they identified were greater than 2 feet wide nearly all the way upstream to their perennial initiation points (PIPs), and in many cases to the channel head (Ch) where well defined channels end.

The CC highlighted the importance of the CMER study in our response to DNR staff's presentation on their "Retrospective Analysis" in Seattle WA in 2009 (Conservation Caucus comments to DNR staff – Tami Miketa and Richard Bigley, March 2009). DNR staff's response to our comments almost one year later (Memorandum from DNR staff Tami Miketa, January 11, 2010) was highly critical of CMER's peer reviewed Type N Demarcation Study, and selectively cited language out of context and made references and assumptions that were false. Both Memoranda are included with these comments for reference.

Most importantly, DNR staff's response specifically states, "*We also caution against the use of specific stream channel widths from the CMER report Palmquist (2005) for regulatory compliance interpretations*." Apparently, the Palmquist (2005) and the Pleus and Goodman (2003) studies on Demarcating Type N streams (both peer-reviewed by the University of Washington) was relevant enough for the WA Forest Practices Board to change the rules governing water typing under WAC 222-16-031 covering nearly 9 million acres of forestland in Washington state, but not good enough for DNR staff to consider for "regulatory compliance interpretations" under the DNR State lands HCP.

Lastly, we question the rationale behind DNR staff's statement that it was not important to first verify that streams were typed correctly in their Retrospective analysis, and the implications of how this lack of critical oversight could potentially undermine the credibility of DNR's monitoring program in the OESF and on all other forestlands covered under the State Lands HCP (1996). In the memorandum from DNR (January 2010), staff state that,

> *In your review, particular focus was placed on the objective of our retrospective study. That project had the objective of documenting how foresters were managing around streams they believed to be Type 5 waters. This project revealed several aspects of current small stream management that could be improved and provided valuable insight in designing the HCS. The accuracy of the original stream typing is not pertinent to the objective of the study. The important question posed and answered by the retrospective study was this: if a stream was believed to be a Type 5, how it was protected.*

This statement clearly indicates that DNR staff fail the see the relevance of first validating water types in their monitoring program BEFORE devoting scarce public money, staff and limited resources to such projects. "*Believed to be Type 5 waters*" in the absence of any form of water typing validation renders the study results useless for adaptive management and forest practices application purposes. This would be analogous to CMER and the NWIFC conducting the Type N Demarcation studies (Pleus and Goodman 2003, Palmquist 2005) without validating and measuring the extent of perennial flow; the criteria in forest practices rule (WAC 222-16-031). If

CMER had not in fact validated that there was perennial flow (requirement by rule) before devoting limited resources to research and monitoring devoted to validating a rule tool, private landowners would simply, and for good reason, challenge the results of the study claiming that there was no way to discern whether or not CMER was on a Type Np (perennial flowing) for Type Ns (Seasonal flowing) stream and therefore, the results would not be applicable.

The DNR State lands HCP clearly states that Type 4 waters are demarcated "*until the channel width becomes less than 2 feet in width between the ordinary high-water marks. These may be perennial or intermittent*." We seriously questions the objective of DNR's study, and it potential usefulness to DNR's State lands HCP, if they have absolutely no way to discern whether or not they are monitoring the effects of riparian buffers, or lack thereof, on Type 4 or Type 5 streams. Again, Type 4 waters require 100 ft. buffers and Type 5 waters may be clearcut. What is the relevance of studying the post hoc effects of clearcutting or partially buffering a Type 4 water, incorrectly called a Type 5 water, that is required by rule to have 100 ft. buffers? Particularly when the riparian functions those buffers are intended to provide are vastly different for Type 5 waters than Type 4 waters? We fail to see the usefulness of such studies without first validating the stream type / hydro-layer as required by rule. If DNR incorrectly applies the Type 5 riparian prescription to Type 4 waters, and hence falls well short of riparian buffer requirements specifically designed to achieve riparian functions outlined in their HCP, the information gleaned from related research will have limited value, if any, precisely because the wrong buffer was placed on the wrong stream type. Water types must be validated first, as per existing rules, BEFORE related research and monitoring takes place, otherwise results may be rendered useless for adaptive management purposes.

Conclusions and Recommendations

First and foremost, the existing DNR hydro-layer was derived from a 10 meter DEM which lacks the resolution necessary to accurately depict the extent and correct location of headwater streams (Type 4 and Type 5 waters) on OESF lands, and DNR State HCP forestlands in general. DNR staff's (Jeff Ricklefs) PowerPoint presentation to CMER (2010) clearly shows the vast difference in resolution between using LiDAR and a 10 m DEM for modeling and updating their hydro-layer. See Appendix 2. Based on his presentation to CMER, the CC supports Mr. Ricklefs "propose solution" to continue to replace DNR's existing hydro-layer with one that incorporates LiDAR instead of an outdated 10 m DEM. However, until such a replacement takes place, any analysis related to the potential impacts to aquatic resources in headwaters streams located in WAUs of the OESF under any of the DEIS Alternatives are rendered invalid. The DEIS for the OESF (June 2010) clearly states in the footnote below Table 3-26,

"*The current DNR GIS stream layer is believed to underestimate the number of Type 5 waters. Mapping standards and methodology vary according to ownership, which result in marked differences in mapped headwater stream density, precluding a direct comparison of stream mileage and density across ownerships*."

Second, DNR's Retrospective Analysis for their Type 5 Headwaters Conservation Strategy clearly shows that Type 4 waters requiring 100 ft. buffers under the State Lands HCP are being incorrectly identified as Type 5 waters which may be clearcut or partially buffered. Based on the fact the Type 4 waters are by definition under the State lands HCP, channels that are greater than 2 ft. wide at OHWM, the CC has repeatedly requested channel width data from DNR staff over the past 15 months and they have yet to receive anything. Rather, DNR staff have opted to simply provide a critique of the CC's comments to the Retrospective study without providing a reason for not producing the channel width data. It is quite simply beyond reason why DNR staff would not collect

channel width data in their Type 5 Retrospective Study when channel width is the defining criteria in the State Lands HCP for defining Type 5 waters. Please, show us the data.

Lastly, it appears that the DNR State Lands HCP's research and monitoring program, or at least the Retrospective Analysis, is premised on the assumption that any deference between pre and post harvest headwater stream channel widths "could" be caused by a number factors (e.g., harvest practices, natural disturbance, and others) without providing a shred of evidence supporting such claims. By definition, a "retrospective" analysis implies that there was no pre-harvest data collected in the study so how can DNR speculate on casual relationships affecting changes in channel width? Unless DNR staff have such evidence, such claims are unfounded and without merit. We question the use of DNR's limited resources on such monitoring techniques if the results are not valid and directly applicable to management of State forestlands covered under the HCP.

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COMMENTS ON THE NORTHERN SPOTTED OWL

Dave Werntz

The 1997 Habitat Conservation Plan's (HCP) strategy defines three conservation objectives for northern spotted owls on the Olympic Experimental State Forest (OESF). One conservation objective is to "[d]evelop and implement land management plans that do not appreciably reduce chances of survival and recovery of the northern spotted owl sub-population on the Olympic peninsula." A second conservation objective is to develop, test, and refine management practices for stands "functioning as dispersal, foraging, roosting, and nesting habitat for spotted owls." The third conservation objective is to develop, implement, test and refine landscape-level forest management techniques that support "occupancy by successfully reproducing spotted owls that are function segments of the Olympic Peninsula subpopulation." The HCP anticipates that restoration activities will provide the necessary quality, quantity and distribution of owl habitat in each landscape unit to ensure long-term conservation of the Olympic's owls populations.

The OESF Land Plan fails to meet the requirements of the 1997 HCP and provides no evidence that habitat will be maintained or restored in sufficient quantity, quality, or distribution to ensure the conservation of the Olympic subpopulation of the northern spotted owl. For instance, the Department of Natural Resources has not completed key analysis that is necessary for determining whether HCP objectives will be achieved, including analysis of life history requirements or viability of spotted owl territories (EIS, p. 243). Lacking this and other pertinent information, the EIS does not sufficiently disclose the impacts to northern spotted owls that would result from implementing the OESF Land Plan.

<u>Spatial Distribution of Habitat</u>

While the EIS does provide some information on the quantity of forest categories that are predicted by various DNR models, it does not indicate how this habitat will be distributed in the landscape units over time. The HCP recognizes that the spatial pattern of spotted owl habitat is key to meeting spotted owl conservation objectives (e.g. "The strategy of conserving spotted owls by restoring habitat capability is proposed as a working hypothesis regarding the necessary quality, quantity and *distribution* of potential habitat, accompanied by an approach for managing toward those conditions." HCP, p. IV.87; "Landscape plans will help integrate diverse goals, *in part by mapping and scheduling timber harvests and other silvicultural activities so that their influence on ecosystem processes can be assessed in advance*." HCP, p. IV.91; "Plans for harvest of young- or old-forest habitat will recognize *the importance of <u>interior</u> old-forest conditions* to overall ecosystem function and will maintain or develop these conditions in accordance with landscape plans" HCP, p. IV.99. "…the composition and pattern of forested landscapes determine their capacity as spotted owl habitat." HCP, p. IV.102; emphasis *added*).

The distribution of habitat, including patch size, patch isolation or connectivity, and edge contrast, have profound effects on wildlife (Diaz and Apostal 1992), and are key to spotted owl survival and recovery. For instance, large blocks of habitat that support multiple pairs of owls is more likely to provide for long term survival and recovery than isolated blocks of habitat supporting only a few individual owls (see e.g. Thomas et al. 1990, Carroll and Johnson 2008). Increased fragmentation of large blocks of habitat is associated with

reduced demographic performance (Courtney et al. 2004), particularly on the Olympic peninsula where spotted owls require larger home ranges due to reliance on northern flying squirrels which have low population densities.

Failure to provide information on the distribution of owl habitat over time, to ensure sufficient interior forest conditions will exist on the OESF over time, to maintain habitat connectivity between owl nest sites, to limit high contrast edge effects, and to demonstrate that the distribution of owl habitat is sufficient to maintain and restore the Olympic subpopulation of owls violates the HCP. The impacts to owls of failing to provide for sufficient distribution of habitat, including patch size, interior forest conditions, connectivity between habitat patches, and edge contrast, are not disclosed in the EIS.

Habitat Function

The OESF Land Plan indicates that it will create structurally complex forest with silvicultural practices and that these forests will eventually function as habitat for northern spotted owls. There is no scientific evidence presented in the EIS to support the notion that owls will use stands managed in the manner proposed in the Land Plan. There is no proposal to test or verify that owls will use stands for dispersal, foraging, roosting, or nesting purposes. Similarly, there is no proposal to test or verify that landscapes will support occupancy by successfully reproducing spotted owls. Since these are two key conservation objectives for the OESF, the current Land Plan is clearly insufficient. The impact of failing to provide dispersal, foraging, roosting, or nesting habitat for northern spotted owls or to provide landscapes that support occupancy by successfully reproducing owls is not disclosed in the EIS.

Improving the Strategy

The EIS states that "DNR does not believe it has sufficient scientific information at this time to improve on the current OESF owl strategy, nor that the continued implementation will result in impacts that have not already been evaluated." (EIS, p. 66).

The OESF conservation strategy was developed with information that was available in 1997. Seven items were identified as key elements that inform the OESF's current owl strategy including the size and trends of the spotted owl sub-population on the Olympic peninsula, the existing distribution of spotted owls, and recent trends in occupancy on DNR lands. It was believed at the time, for instance, that the Olympic subpopulation was substantially larger that previously believed, it was interconnected, and was either stable or declining slowly (Holthausen et al. 1994, Burnham et al. 1994). It also was believed that the overall status of the Olympic Peninsula sub-population and habitat was secure (HCP, p. IV.102).

There has been a considerable amount of research on spotted owl demography conducted since the 1997 HCP and OESF conservation strategy. Recent analysis on spotted owl demography performance indicate that spotted owls are not stable, but declining at a rate of 4.4% a year between 1992-2002, that rates of decline are accelerating, and that owl populations on the Olympic peninsula have declined by 20-30% (USFWS 2004). Occupancy rates of spotted owl territories in adjacent federal lands have declined by 60% between the early 1990s and 2008 (Gremel 2008). Apparently, data hasn't been collected on DNR lands since 2001. The Spotted Owl Recovery Plan identifies ongoing habitat loss on non-federal (state and private) lands as a major threat to

spotted owls conservation (USFWS 2008). Between 1996 and 2004, spotted owl habitat continued to be harvested in the western Olympic peninsula (Pierce et al. 2005).

It's clear that scientific research has shown that key assumptions that form the basis of the OESF conservation strategy are erroneous, and that the continued implementation of the conservation strategy is likely to further imperil northern spotted owls, especially as proposed by the OESF Land Plan. These impacts are not disclosed in the EIS.

The OESF Land Plan proposes to increase owl habitat logging, including owl nest sites (termed Status One Owl Circles) over the next decade. The HCP anticipated that DNR management would result in adequate amounts of habitat to provide for multi-species conservation across the landscape covered by the HCP. In the OESF, it was expected that 60-70% of the OESF landscape would have structurally complex forest by 2100 (HCP, p. IV.180). In contrast, the OESF Land Plan anticipates that the OESF landscape will have only between 41-56% of structurally complex forest by 2100 (EIS, p. 60). Furthermore, the OESF Land Plan proposes logging over 1,000 acres of structural habitat within owl nest sites (see EIS Table H-1), despite the fact that owl nest sites are most likely to be re-occupied by recovering spotted owl populations (EIS, p. 252).

Under either Alternative in the OESF Land Plan, less structurally complex forest will be created than anticipated by the HCP. It is not disclosed in the EIS how reducing the amount of suitable owl habitat around nest sites, or elsewhere in the OESF landscape will contribute to spotted owl conservation. Given the habitat loss is a major threat to spotted owl conservation; the OESF Land Plan will likely appreciably reduce chances of survival and recovery of the northern spotted owl sub-population on the Olympic peninsula and foreclose options for ecosystem support provided by older forests. As a result, the OESF Land Plan is incompatible with the HCP.

OESF FOREST LAND PLAN DEIS COMMENTS: MARBLED MURRELETS

Kara Whittaker, PhD and Herb Curl, PhD

Chapter 1: Background

1. *p. 28: Since adoption of the 1997 HCP, numerous research and monitoring projects have been conducted in the OESF…the majority of them related to marbled murrelets, [including] several trials to test silviculture techniques to accelerate habitat restoration.*[5]

Please cite these projects and describe if/how their results were incorporated into the DEIS alternatives adaptively. If these results were not incorporated, explain why.

Chapter 2: Alternatives

2. p. 56: Is active management conceived to be an ongoing operation, causing considerable disturbance in the enhanced habitat, or is it a one-time operation? In either case road building would fragment murrelet habitat and provide for the introduction of invasive species, including forest pests and diseases, and avian predation of future murrelet nest sites over the long term. These road impacts must be considered in the choice of alternatives and not limited to the effects on water quality and riparian habitat.

3. *p. 56: Measurable Objectives the Alternatives Must Meet… To attain and maintain within each landscape 20 percent potential Old Forest and 40 percent potential Young Forest habitat in support of the conservation of the northern spotted owl, marbled murrelet, and other wildlife species.*

How were these habitat targets established? Please cite best available science used.

4. *p. 66: DNR plans to use this report [Raphael et al. 2008] in developing a long-term murrelet strategy for western Washington within the next few years. The outcome of that strategic planning process may result in an update and addendum to the OESF Forest Land Plan and environmental analysis after it is completed.*

In lieu of a completed long-term conservation strategy for murrelets, all of Raphael et al. (2008)'s science recommendations for the OESF should be applied now. This is an extremely valuable source of best available science with recommendations tailored specifically to each Landscape Planning Unit of the OESF, which the DNR should take full advantage of without further delay. By applying the precautionary principle now, no future options are precluded, which is the most appropriate approach for reversing the decline of a threatened species. This approach is analogous to the DNR HCP "no take" strategy (Alternative C), which would have deferred the harvest of marginal habitat or surveyed, unoccupied suitable habitat until long-term plans had been developed and approved for the entire planning area (WDNR 1996). This alternative would have offered the highest potential for providing adequate murrelet habitat and breeding site protection, the highest likelihood of successfully supporting murrelet reproductive potential, and the highest likelihood that the population would persist for the long term on DNR-managed lands and in western Washington (WDNR 1996). It is not too late to apply this approach and the recommendations of Raphael et al. (2008) in a revised DEIS. Alternatively, the DEIS can be

5 Underlined text is for emphasis added, and quotes from the OESF Forest Land Plan DEIS (2010) are italicized.

revised after the completion of the Marbled Murrelet Long-Term Conservation Strategy, which will be founded on the recommendations of Raphael et al. (2008).

Chapter 3: Environmental Analysis: Marbled Murrelet

5. *p. 256: Declining marbled murrelet populations have been predicted by demographic models (USFWS 1997; McShane and others 2004), which estimated losses of about three to seven percent per year across the entire three-state range.*

How has the murrelet population changed in the OESF since 1997 (increased, stable, or decreased)?

6. *p. 256: The USFWS recognized habitat loss as the major factor causing the decline of marbled murrelet populations*.

It is possible that increasing ocean temperature, more frequent ENSO events, and declining ocean pH will make nutrition more difficult for murrelets. It is thus incumbent on terrestrial activities to <u>not</u> add to these stressors.

7. Accurate estimates of the current amount of murrelet habitat in the OESF are critical for assessing the environmental impacts of the various alternatives over time. Unfortunately, <u>two</u> different murrelet habitat estimates are presented in the DEIS, and <u>two additional</u> estimates are given in a draft DEIS (Minkova 2009: App. I, attached) and agreement (WDNR 2010: App. II attached), which vary by as much as <u>46,407 acres</u>:

p. 257: In the OESF, the approach included a two-year field study (1994-1995) to identify forest and landscape characteristics associated with murrelet habitat use for the purposes of classifying potential murrelet habitat using existing forest inventory data. This study, coupled with additional field-surveys, resulted in identification of approximately <u>54,450 acres</u> of "reclassified habitat" on DNR-managed lands in the OESF.

p. 259: Table 3-73. Current Condition of Marbled Murrelet Indicators, by Landscape

OESF Total Structurally Complex forests (acres) = <u>31,578</u>

Marbled Murrelet habitat estimates (acres) from Tables 6-7 (Minkova 2009)

	Marbled Murrelet HCP Policy (Interim Conservation Strategy)	Woodstock Model (Phase 3b) (OESF Forest Land Plan estate model)
DNR managed	270,343	270,302
Non-habitat	192,358	216,124
Habitat	*<u>77,985</u>*	*<u>54,178</u>*

Minkova (2009) described a fifth estimate of murrelet habitat (Marbled Murrelet Planning – a dataset developed as part of the [Raphael et al.] 2008 Science Report to illustrate the recommended approach for the Long-Term Conservation Strategy) but did not present the acreage value.

The OESF DEIS must describe which estimate is being used for each alternative and explain why it was chosen over the other estimates.

8. *p. 258: Raphael and others (2008) used forest stand development stages…as a surrogate for nesting habitat, classifying a subset of the Competitive Exclusion stage and the more complex, older stages—Biomass Accumulation and Structurally Complex—as "potential marbled murrelet habitat". For analysis in this Draft EIS, a narrower definition is used, wherein only Structurally Complex forests are used as an indicator of potential marbled murrelet habitat.*

Why was a narrower definition of "potential marbled murrelet habitat" used instead of the broader definition recommended by Raphael et al. (2008)? Are you assuming forests in the Biomass Accumulation stage are not used by murrelets and thus may be released for harvest?

9. *p. 258: The methods used to derive the carrying capacity index presented in this Draft EIS are the same as Raphael and others (2008), except that the index does not include the adjustment for edge effect.*

Raphael et al. (2008) estimated a discount factor (P_{edge}) of 0.70 to modify the predicted contribution to carrying capacity in edge habitats. Why doesn't the OESF DEIS Carrying Capacity Index include this adjustment for edge effects given the negative edge effects on murrelets cited? The amount of potential marbled murrelet habitat is overestimated without this discount factor, thus underestimating the probable adverse impacts of the alternatives on murrelet populations.

10. *p. 259: The area adjacent to an occupied site is defined as the area located within 100 meters of the occupied site (Raphael and others 2008). This area is labeled in this Draft EIS as a "marbled murrelet sensitive area".*

Why not use terminology consistent with the source (Raphael et al. 2008) for clarity? "Marbled murrelet sensitive areas" are 100 m "buffers".

Raphael et al. (2008) recommend "that DNR achieve pole-sized or better structure over 100% of the area of a 328-foot (100-meter) buffer around designated occupied and older forest sites" (App. C). They explain that intact buffers around occupied sites are needed to "maintain the stand structure in the condition that provides high-quality nesting habitat for marbled murrelets (McShane et al. 2004), reduce potential for blowdown (Jaross and Read 2006), maintain microclimates within the occupied stand (Chen et al. 1993, 1995, Kremsater and Bunnell 1999, McShane et al. 2004), and reduce the impacts of hard edges, which have been linked to increased nest predation (Nelson et al. 2002)."

a. Did either of the DEIS alternatives follow this guidance for management activities in Marbled Murrelet Sensitive Areas?

b. Were "Analysis Assumptions for Olympic Experimental State Forest" (Raphael et al. 2008, App. C) applied in part or whole to either of the DEIS alternatives?

11. p. 259: All "natural" disturbances discussed are to a considerable degree related to human activities, some more than others. Windthrow can result from clearcut harvest of adjoining acreage on ridges exposed to high winds. Landslides can be caused by logging on unstable slopes. In both cases forest management plans should explicitly address these concerns in Marbled Murrelet habitat.
    a. What is the DNR policy with regard to letting wildfires burn when no humans or human features are in danger? Is murrelet habitat protected if it's not slated for harvest?
    b. Please describe what pests and diseases might affect murrelet nesting habitat and plans for suppression, if any.

12. *p. 259: Structurally Complex forests will account for about 20 percent of the OESF at the end of the tenth decade under either alternative.*

DNR needs to reach the 20% Structurally Complex forest habitat target as soon as possible (well before the tenth decade) to help avoid extirpation of the murrelet in the OESF in the meantime.

13. p. 259: The No Action alternative yields 4,216 more acres of potential marbled murrelet habitat than the Landscape alternative after the tenth decade.
    a. How many murrelet territories does this represent? How does this compare with the level of take authorized by DNR's incidental take permit?
    b. Under the Marbled Murrelet Interim Conservation Strategy (WDNR 1997), 5% of "marginal" occupied habitat was to be released for harvest. How much of this habitat has already been harvested, and how many murrelets have already been "taken"? How many are authorized to be "taken" from this point forward?

14. *p. 260: The total harvest in marbled murrelet sensitive areas under the Landscape Alternative is more than double that under the No Action Alternative, although the difference is largely attributed to a higher projected level of variable density thinning.*

The Landscape Alternative would have the greatest adverse impact on Marbled Murrelets by harvesting a total of 2,008 acres (408 acres of variable retention harvest plus 1,600 acres of thinning) in the buffers on occupied sites in the first decade alone. Unfortunately, the definition of "thinning" in this DEIS includes regeneration harvests (clearcuts) with at least 50 percent tree retention and at least 40 percent basal area retention by area. We are concerned that these prescriptions will result in further loss and fragmentation of murrelet habitat rather than accelerate stand development towards more Structurally Complex forests.

15. *p. 261: The higher level of harvest under the Landscape Alternative poses a potentially greater risk of impacting marbled murrelets in the short-term.*

Increasing the short-term pressure and impact to murrelets by increasing harvest levels in the Marbled Murrelet Sensitive Areas cannot be justified for a species whose populations have not yet stabilized. The DEIS for the DNR HCP (WDNR 1996) states "the fundamental biological criteria for assessing the environmental impact of forest management on marbled murrelets are a stable or increasing, well-distributed, and resilient population". These biological goals (also recommended by Raphael et al. 2008), will require more habitat to increase the carrying capacity. A higher target level of habitat is justified because some habitat will probably be lost to disturbance and/or climate change over the next 100 years. Further, "the recovery team has stated that the next 50 years will be a critical time for the marbled murrelet since little additional suitable habitat is expected to develop within LSRs (Late-Successional Reserves) before that time" (WDNR 1996). Murrelet populations can't afford more short-term losses, and increasing the level of risk should be postponed until they at least stabilize.

16. *p. 262: Though the implementation of other conservation strategies (for example, northern spotted owl and riparian) the increase in Structurally Complex forest and the corresponding increase in carrying capacity on forested state trust lands in the OESF is expected to aid in the conservation of murrelet populations on the Olympic Peninsula as a whole.*

Riparian buffers 150-300 feet wide per side won't provide interior habitat for murrelets, especially where the interior and exterior zones are thinned or clearcut. Raphael et al. (2008) delineated murrelet interior habitat (core area) as a 328-foot (100 m) interior buffer of the stands of interest. Thus, it is unlikely riparian buffers will satisfy murrelets' habitat requirements unless they are at least 328 feet wide and left largely or wholely intact.

17. *p. 267: A recent study by van Mantgem and others (2009), suggests that regional warming (0.5° to 0.7° F per decade from the 1970s to 2006) may be the dominant contributor to increases in tree mortality rates. In the Pacific Northwest, the tree mortality rate is one of the highest in the nation and on a trajectory to double in the next 17 years (van Mantgem and others 2009).*

A high tree mortality rate will confound the results of any forest model that does not include it as a parameter. Forest models under any alternative for long-term forest management must take climate change into account, beyond an estimate of the level of carbon sequestration.

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APPENDIX: Minkova 2009, Draft OESF – NSO, MaMu, 2009-10-30.pdf will be attached as a separate pdf. file as part of the Comments.

HARVEST LEVELS

Miguel Perez-Gibson, WEC

GENERAL

How well does DNR meet the Olympic Experimental State Forest management objectives?

The DEIS states:

> "DNR has three measurable objectives for the management of the state trust lands in the OESF as a working forest:
> 1. To protect, maintain, and aid natural restoration of riparian systems on DNR-managed lands in the OESF by maintaining and increasing the recruitment potential for large woody debris and shade associated with riparian systems and avoiding detectable changes in levels of peak flow.
> 2. To attain and maintain within each landscape 20 percent potential Old Forest and 40 percent potential Young Forest Habitat and Better in support of the conservation of the northern spotted owl, marbled murrelet, and other wildlife species.
> 3. To generate trust revenue through the sale of timber. The current sustainable harvest level approved by the Board of Natural Resources for the OESF planning unit is to sell approximately 576 million board feet of timber over a decade, which is projected to generate about $144 million in gross revenue." p. 16

The above objectives are good, but do they address the "experimental" nature of the Olympic Experimental State Forest? We don't believe so. The objectives stated above are too limited.

The 1997 Habitat Conservation Plan "highlighted the OESF as the location where conservation, production, research and monitoring would be combined with innovative silvicultural techniques, communication and education in a unified effort" (P. 5, Draft OESF Research and Monitoring Plan, letter from Federal Services to DNR, July 21, 2009).

One of the outcomes of the Settlement Agreement was the expectation that DNR would utilize "Bio-diversity pathways" as a means to development new and innovative silvicultural techniques. Innovation is lacking in this plan. That Settlement called for a Demonstration Project

> "testing Dr. Andrew Carey's biodiversity pathways treatment principles, which are replicated in several areas and demonstrate the application of different scales of openings, scale of variation and overstory retention on forest management units at a stand level. The demonstration projects will be established with a peer reviewed scientific design intended to replicate the same two or three variations on the same types of stands. These demonstration projects will be developed and implemented as part of the OESF SHIP during the term of this Agreement." (WEC vs. Sutherland, II.A)

HARVEST LEVELS

The 2004 Sustainable Harvest plan calculated the OESF sustainable harvest at 63.8 MMBF/year for the first decade look. As a result of the 2007 Settlement Agreement, the harvest was recalculated to reflect the issues addressed in the agreement. The harvest rate was adjusted to 57.6 MMBF/year. This is the level approved by the Board of Natural Resources. It is the current harvest level, and by definition the actual no action harvest

level. This plan has calculated the "no action" harvest level at 75 MMBF/year. That is a 30% increase above current harvest level. While under SEPA, the lead agency has some discretion as to how it describes the "no new government action", creating a no action alternative which has a disturbance rate that is 30% above current levels understates the level of change proposed. The preferred alternative is actually a 70% increase above the current approved actual no action harvest levels. As well, a lower impact alternative to current harvest levels was not included. The range of harvest levels considered should include a "range" of alternatives. As requested earlier in our response, we are requesting a review of the Conservation Caucus Alternative that is enclosed.

- 2004 OESF level = 63.8 MMBF/yr
- 2007 Settlement = 57.6 MMBF/yr
- DEIS
    1. Modified No Action= 75 MMBF/yr
    2. Preferred Alt. = 98 MMBF/yr

We are encouraged that the modeling suggests that the stand structure outcomes as described in the HCP (Table IV.14) will be realized by the alternatives included. However, detailed age class distribution tables by WAU were not included. Also, the plan does not recognize that these outcomes are required.

It would be helpful if the DEIS had information that gave more detail on the harvest. In both alternatives there is an emphasis on reducing the stands from the competitive exclusion stage, reducing the number of acres in that category. A table by watershed unit/landscape planning unit would be helpful:

CURRENT CONDITION

LANDSCSPE PLANNING UNIT	FOREST TYPE	AGE	AVERAGE DBH	VOLUME PER ACRE	ACRES			

LANDSCAPE ALTERNATIVE (FIRST DECADE)

LANDSCAPE PLANNING UNIT	FORES T TYPE	AGE	AVERAGE DBH	VOLUME PER ACRE	ACRES	VRH AVERAGE ACREAGE PER YEAR	VDT AVERAGE ACREAGE PER YAR	VOLUME PER ACRE

"NO ACTION" ALTERNATIVE (FIRST DECADE)

LANDSCAPE PLANNING UNIT	FOREST TYPE	AGE	AVERAGE DBY	VOLUME PER ACRE	ACRES	VRH AVERAGE ACREAGE PER YEAR	VDT AVERAGE ACREAGE PER YAR	VOLUME PER ACRE

ACREAGE DISTRUBED

On page 89, "Harvest Types (Methods)", the average annual harvest is pegged roughly at 5,000 acres per year with either the "No-Action" or the Landscape Alternative. This is a huge increase from the *Sustainable Harvest Calculation Addendum* approved by the Board of Natural Resources in 2007. The current annual acreage disturbance level is roughly 900 acres per year. The proposed 5,000 acres per year level of disturbance is over a 500% increase in the average per year. In decade 10 of the Landscape alternative it is closer to 1000% increase.

Looking at this issue a little more closely, both the "no-action" and the Landscape alternatives predict harvesting around 1,400 acres of "Variable Retention Harvest" (VRH in practice as been a clear-cut with 8 to 10 trees per acre left).

A 1400 acre clear-cut harvest level about the existing 900 acre harvest level is at least a 55% increase in clear-cuts. That is without deducting thinning acreage from the overall 900 acre harvest level.

Marbled Murrelets and proposed Harvest:

The Department is expected to create a Marbled Murrelet Long Term Conservation Strategy. The OESF will be included in this plan. This plan should be completed prior to the OESF Plan. The 55% increase in clear-cuts proposed in this draft creates concerns. Without knowing what land is needed to conserve the Marbled Murrelet for the long term, the Department risks harvesting potential Murrelet habitat.

Economic Variable Density Thinning:

The plan states

> *"Although the analysis is not completed, initial results suggest that not all the thinning harvests will be financially feasible (Charts 2-3 and 2-4)."* p 61

Our concern is that the Trust Beneficiaries will base their revenue expectations on an overly optimistic harvest level. If in fact, this much thinning is needed, moving some of this harvest from commercial to the pre-commercial or even a break even category would be prudent.

GENERAL COMMENTS

Marcy Golde

1. The electronic version of the DEIS available through the DNR website and the SEPA notification of June1, 2010 for the OESF Landscape Plan is impossible for anyone to use for comments. Because there are no page numbers on this electronic version, no one can reference the page they are commenting on. To provide citations it requires the use of a printed copy which contains page numbers. These copies are only available in person at the DNR SEPA office in Olympia, or by request and by mail. This is a fatal flaw in the public review process.
2. The DEIS either does not show either the cumulative harvest or disturbance in numbers. The information in Chart 2-3 needs to be presented in tabular, numerical form as well. Tables summarizing the harvest in board feet and disturbance in acres should have appeared in the Executive Summary or at the beginning of Chapter 2. These Tables should have been in the following format.

VRH

LPU	Decade									
	1	2	3	4	5	6	7	8	9	10
Clallam										
Clearwater										
Coppermine										
Dickodochtedar										
Goodman										
Kalaloch										
Queets										
Reade Hill										
Sekiu										
Sol Duc										
Willy Huel										
TOTAL										

Such tables for VRH and VDT and for each of Alternative are all needed. In a revision it should also be provided for the other alternatives used.

IMPACTS ON FISH

Coleman Byrnes

Here are some comments concerning the OESF HCP as it applies to salmon and riparian vegetation. The document is hard to read, but once one wades through the verbiage, they find that implications of both the No Action and Landscape Alternative are not good for salmon or salmon recovery. In the introductory pages a prediction is made concerning adverse effect of these plans concerning on the six indicators of riparian function. Under the Landscape Plan, 97% of Type 3 streams will experience negative trends in one or more of the 6 indicators of riparian function. 33% of streams under this plan could be adversely impacted in regards to shade, and 34% in regards to micro habitat. Under the No Action plan, this percent of steams aversely affected is 77%. 13% of Type 3 stream under No Action are expected to have more negative peak flow incidents.

Despite these predictions, the document claims that the negative impacts listed above will be negligible because only 1 or 2 of the indicators of riparian function per stream would be negatively affected. But no scientific data was offered to support this supposition. A negative impact is a negative impact, and will be another factor that will stress our depleted salmon runs and act as a barrier to their recovery. The document claims that negative impacts will not be mitigated but rather will be monitored as a part of a long term study. However, DNR has recently lost funding and personnel in budget cuts. DNR lacks the money, the on ground technicians, and probably the will power to conduct this monitoring.

Despite the claim that negative impacts will be insignificant, the document states that 19 streams under the No Action Plan will become impaired as would 14 under the Landscape Alterative. The claim is made that in the long term stream health will improve under both plans, and impairment is short term. But “short term” in this context is measured in decade and salmon don’t have decades. Their numbers are too depressed for that sort of time frame. Nowhere is stream improvement under either option predicted for the short term. So either option offers the loss of ecological function over the next few decades.

The Landscape Alternative is by far the worst of the two as applied to riparian management. Both plans show negative impacts to the recruitment of large woody debris in many Type 3 streams, but more streams are negatively affected by the Landscape Alternative (chart 3-36). The same is true for leaf and needle litter recruitment (Chart 3-39), stream shade (Chart 4-44), riparian microhabitat (Chart 3-48), and adverse affects of wind throw (Chart 3-52 and 3-53) And yet in all these cases the document offers other charts that claim that the overall negative impacts are less under the Landscape Alternative. This calls for a leap of faith that no rational person would make. Here is an example. The document states that the Landscape Plan would result in fewer adverse peak flows events (Chart 3-56) but more potential peak flow event (Chart 3-57). What does this mean?

Where these adverse effects occur is quite important. Some streams are more important to salmon production and survival than others. More or larger peak flow events on the Hoko River, for example, could potentially eliminate Chinook spawning in WTRIA 19.Will the predicted adverse effect on riparian in Type 3 streams take place in Coho rearing habitat? There are 2too many questions and not enough answers.

This is not to say that the No Action plan is a good one. Rather it is the lesser of 2 evils. Both predict that damage will be done to salmon habitat. Neither plan is a real habitat plan. Rather they are harvest management plans that are trying to masquerade as habitat plans. As they are envisioned, the near future, under both plans, promises aquatic impairment. They will not help salmon or aquatic functions. There are no predictions for near term recovery for any stream in the OESF. We are promised real improvement in the distant future, but have been shown no road map of how to get there. How about a plan that has a more favorable time line for salmon recovery and is more conducive to salmon survival? Thank you.

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APPENDICES (submitted as separate pdf files)

A. **RICKLEFS - DNR - 2009-01-29 HCS briefing.pdf**
B. **Caucus comments on proposed Headwaters Conserv. Strat. 3-3-09.pdf**
C. **Draft OESF - NSO, MaMu - 2009-10-30.pdf**
D. **DNR response to Conservation Caucus 11 Jan 2010.pdf**