

Appendix L

# Response to Comments

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# Acronyms and Terms

## Acronyms

ACD	Angular canopy density
AFRC	American Forest Resources Council
CMER	Cooperative Monitoring Evaluation and Research
CRANE	Columbia River Alliance for Nurturing the Environment
DEIS	Draft environmental impact statement
DNR	Department of Natural Resources
EIS	Environmental impact statement
ESA	Endangered Species Act
ESU	Evolutionarily significant unit
FEIS	Final environmental impact statement
FEMAT	Forest Ecosystem Management Assessment Team
FMU	Forest management unit
FRIS	Forest Resource Inventory System
FVS	Forest Vegetation Simulator
GIS	Geographic information system
LiDAR	Light detection and ranging
LTCS	Long-term conservation strategy
MMBF	Million board feet
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Association
NOTAC	North Olympic Timber Action Committee
NTU	Nephelometric turbidity units
NWIFC	Northwest Indian Fisheries Commission
OESF	Olympic Experimental State Forest
OFCO	Olympic Forest Coalition
PHODAR	Photogrammetric point clouds
RCW	Revised code of Washington
RDEIS	Revised draft environmental impact statement
RS-FRIS	Remote Sensing Forest Resource Inventory System
SEPA	State Environmental Policy Act
TIPSY	Table Interpolation for Stand Yields
TMDL	Total daily maximum load
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WFPB	Washington Forest Practices Board

**Documents, Permits, Litigation**

2008 Science Team Report	<i>Recommendations and Supporting Analysis of Conservation Opportunities for the Marbled Murrelet Long-Term Conservation Strategy</i> , published by DNR in 2008
DEIS	Draft EIS for the forest land plan, published by DNR in 2010
RDEIS	Revised draft EIS for the forest land plan, published by DNR in 2013 (replaces DEIS)
Draft OESF forest land plan	Draft forest land plan for the OESF, published by DNR in 2013 as an appendix to RDEIS
HCP	<i>State Trust Lands Habitat Conservation Plan</i> , published by DNR in 1997
Implementation Agreement	Implementation agreement for the HCP, published by DNR as Appendix B of the HCP
2007 Implementation Monitoring Report	Habitat Conservation Plan for State Trust Lands 2007 Implementation Monitoring Report, published by DNR in 2008
Marbled Murrelet OESF Memo	<i>Memorandum for Marbled Murrelet Management Within the Olympic Experimental State Forest</i> , prepared by DNR on March 7, 2013
Marbled Murrelet Recovery Plan	Recovery Plan for the Threatened Marbled Murrelet ( <i>Brachyramphus marmoratus</i> ) in Washington, Oregon and California, published by USFWS in 1997
Incidental take permit	<p>The term “incidental take permit” includes all of the following:</p> <p><b>PRT 812521.</b> DNR’s original incidental take permit, issued by USFWS in 1997; covers northern spotted owl, marbled murrelet, gray wolf, grizzly bear, bald eagle, peregrine falcon, Aleutian Canada goose, Columbian white-tailed deer, Oregon Silverspot butterfly</p> <p><b>PRT 812521 Amendment (bull trout).</b> An amendment to DNR’s original incidental take permit to include bull trout, issued by USFWS in 1998</p> <p><b>PRT 1168.</b> DNR’s incidental take permit for Lower Columbia steelhead and Chinook, Puget Sound Chinook, Hood Canal summer-run chum, Columbia River chum, and Lake Ozette sockeye, issued by NOAA Fisheries in 1999</p>

PRT 812521 Biological Opinion	<i>Intra-service Concurrence Memorandum and Biological Opinion for the Washington Department of Natural Resources' Habitat Conservation Plan.</i> The biological opinion prepared by USFWS in 1997 for the HCP.
PRT 812521 Amendment Biological Opinion (bull trout)	<i>Reinitiation of the Biological Opinion and Conference Opinion on the Amendment of an Incidental Take Permit (PRT-812521) for the Washington State Department of Natural Resources' Habitat Conservation Plan to Include Bull Trout (Salvelinus confluentus) on the Permit.</i>
2006 Settlement Agreement	Washington Environmental Council et al v. Sutherland et al. Settlement Agreement (King County Superior Court No. 04-2-26461-8SEA, dismissed April 7, 2006)

**Other Terms**

Analysis model	Forest estate model used to develop the DEIS, RDEIS, FEIS, and draft OESF forest land plan
Tactical model	Forest estate model DNR will use as a tool during plan implementation
Interior-core buffer	Buffer closest to stream
Exterior buffer	Buffer adjacent to the interior-core buffer
Young Forest Habitat	Sub-mature forest and young forest marginal habitat types combined
Old Forest Habitat	Type A, Type B, high-quality nesting, and mapped Old Forest habitat types combined
Federal Services	USFWS and NOAA
Ecology	Washington State Department of Ecology

# Introduction

In October, 2013, DNR released the Revised Draft Environmental Impact Statement (RDEIS) for the Olympic Experimental State Forest (OESF) forest land plan. Due to the interest shown by stakeholders and the public, DNR held an extended comment period (45 days instead of the required 30 days) for the RDEIS. During the extended comment period, DNR received comments from a wide range of individuals and organizations (Table L-1).

Following an initial review of the comments, DNR developed brief summaries of the comments received. In some cases, DNR combined similar or identical comments from different individuals into a single summary. DNR then wrote responses to each comment summary. In the following document, these summaries are organized first by subject, then by topic.

Each comment summary lists the name of the commenter and a page number reference to their original comment. The original comments can be found at the end of this appendix.

The comment responses provided DNR an opportunity to further explain its objectives, management approach, analysis methods, and policies. These responses should help readers deepen their understanding of both the RDEIS and the final EIS (FEIS).

DNR made a number of changes to the FEIS based on these comments, the most significant of which was adding a new action alternative, the Pathways Alternative. This alternative features the application of “pathways” to each landscape. For a full discussion on this alternative, refer to Chapter 2 of the FEIS.

**Table L-1. List of Commenters on OESF RDEIS**

<b>Organization</b>	<b>Commenter</b>
<b>AFRC</b>	Tom Partin
<b>Conservation Northwest</b>	Dave Werntz
<b>CRANE (Submitted by Perkins Coie)</b>	Grayson Holmes
<b>Forks, City of</b>	William Fleck
<b>Interfor</b>	Steve Courtney
<b>Mendoza Environmental, LLC</b>	Christopher Mendoza
<b>NOTAC</b>	Carol Johnson
<b>None (no affiliation)</b>	Colman Byrnes Connie Gallant Donald Hansen William Spring
<b>Olympic Forest Coalition</b>	Miguel Perez Gibson Hellmut Golde Marcy Golde Peter Goldman Mike Haggerty Don Hamerquist

Table L-1. List of Commenters on OESF RDEIS, Continued

<b>Organization</b>	<b>Commenter</b>
<b>Olympic Forest Coalition</b>	David Mann Chris Mendoza David Montgomery Derek Poon Janeen Porter Jill Silver Darrell Smith Shelley Spalding Dave Werntz Kara Whittaker
<b>Olympic Natural Resources Center</b>	Miranda Wecker
<b>Quinalt Indian Nation</b>	Dave Bingamen Fawn Sharp
<b>Quilleute Nation</b>	Mel Moon
<b>Seattle Audobon Society</b>	Chris Karrenberg Brian Windrope
<b>Sierra Club</b>	Monica Fletcher
<b>Sierra Pacific</b>	John Gold
<b>Washington Forest Law Center (submitted as appendix to OFCO comments)</b>	Paul Kampmeier
<b>Wild Salmon Center</b>	Guido Rahr
<b>WDFW</b>	Gary Bell Chris Byrnes

# Comment Summaries and Responses

## ■ Subject 1: Alternatives

**No.:** 1

**Topic:** Range of Alternatives

**Source:** OFCO (summary), page iv; David Mann, OFCO, pages 2, 3, and 4; Tom Partin, AFRC, pages 5 and 6; Steve Courtney, Interfor, page 2

The RDEIS is inadequate in only considering the No Action Alternative and Landscape Alternative. First, SEPA requires that public bodies consider a reasonable range of alternatives, and that every EIS include both a description of the proposed action and alternatives to the proposed action. RCW 43.21C.030(c)(iii), WAC 197-11-440(5). The term “alternatives” is plural not singular, thus requiring more than a single alternative to the proposal. This plural requirement is further explained in the SEPA rules. WAC 197-11-440(5)(a) requires the EIS to examine the proposal and “alternative courses of action.” Similarly, WAC 197-11-440(5)(b)(ii) mandates that the no action alternative shall be evaluated and compared to other alternatives.

Second, there appears to be essentially no difference between the No Action Alternative and the Landscape Alternative, except for the use of the forest estate model to select stands for harvest, under the same standards as would be used in the absence of the forest estate model.

Third, the SEPA rules require further that “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(5)(b). It appears that the relative negative impacts across multiple topics are higher for the proposed Landscape Alternative than the No Action Alternative. Failing to include an alternative that meets the proposal’s objectives with decreased impacts—at least decreased impacts than the No Action alternative—is a violation of SEPA and may not be legally defensible.

The required discussion of alternatives is of major importance, because it provides a basis for a reasoned decision among alternatives having differing environmental impacts. *Brinnon Group v. Jefferson County*, 159 Wn.App. 446, 481, 245 P.3d 789 (2011).

**Response:** WAC 197-11-440(5)(b) describes a “reasonable” alternative as one that “includes an action that could feasibly attain or approximate a proposal’s objectives, but at a lower environmental cost or decreased level of environmental degradation.” This rule serves as a screening tool for developing alternatives: “the word “reasonable” is intended to limit the number and range of alternatives, as well as the amount of detailed analysis for each alternative” (WAC 197-11-440(5)(b)(i)). The no action alternative also is an alternative that is evaluated (WAC 197-11-440(5)(b)(ii)).

As potential alternatives are identified, they are measured against certain criteria: Do they feasibly attain or approximate the proposal’s objectives, and do they provide a

lower environmental cost or decreased level of environmental degradation than the proposal? It is not always evident at the beginning of the process whether an alternative meets these criteria (Section 3.3.2 of the SEPA Handbook [Ecology 2016]). An agency does not need to evaluate every possible alternative iteration.

At the beginning of this planning process, DNR considered multiple action alternatives. However, in the DEIS and RDEIS analyses, only one action alternative (the Landscape Alternative) was considered reasonable. For an explanation of why each action alternative was eliminated in the early stages of planning, refer to pages 2-25 through 2-29 of the RDEIS. Lead agencies may proceed with an EIS with only one action alternative: “Occasionally, a lead agency may decide that there are no reasonable alternatives to a proposal. In this case, the no-action alternative and the proposed action would be the only alternatives examined in the EIS” (Section 3.3.2 of the SEPA Handbook [Ecology 2016]).

In comparing the two alternatives (Landscape and No Action), with few exceptions impact levels were the same under each alternative. Impact levels were the same or similar between the alternatives because both alternatives must implement current DNR policies.

However, there are important differences between these alternatives. Under the Landscape Alternative, DNR will automate the 12-step watershed assessment process within the tactical model. The Landscape Alternative also includes a robust research and monitoring program and adaptive management process, a new natural disturbance procedure, and the “planning from a landscape perspective” process using the tactical model. Planning from a landscape perspective involves looking at the entire land base at different spatial scales to determine the best means of meeting multiple objectives over time. Refer to Table 2-2 on page 2-24 in the RDEIS for a summary of the differences between the No Action and Landscape Alternatives. Refer to Comments 2 and 3 for more information about the range of alternatives. More information on the tactical model can be found in Chapter 2 of the FEIS.

Consistent with WAC 191-11-560(1)(b) and Section 3.5.1 of the SEPA Handbook, DNR developed and evaluated a new action alternative for the FEIS. DNR developed this new alternative in response to comments received that recommended DNR consider another action alternative. This new alternative, known as the Pathways Alternative, is a reasonable alternative because it meets the proposal's objectives and stays within the bounds of DNR policies. Refer to Chapter 2 of the FEIS for a full description of this alternative, and Chapter 3 of the FEIS for analysis of the new alternative.

**No.:** 2

**Topic:** Range of Alternatives and DNR Policy

**Source:** Don Hamerquist and Janeen Porter, OFCO, pages 146 and 147

DNR asserts that the HCP is a matter of DNR policy, and that management actions that are based on this policy cannot be changed. Following this logic, the draft confines its discussion of OESF management within two alternatives, both of which are completely inadequate: to continue

current policies and practices (No Action Alternative), or modify them by organizing harvests through a landscape modeling plan that would result in slightly improved revenue and, or so it is claimed, only marginally reduce protections for public resources (Landscape Alternative).

Strictly speaking, the HCP is not a DNR policy. The HCP is a binding legal agreement between DNR and a range of state and federal agencies to forego normal enforcement of current environmental regulations in exchange for certain guarantees and undertakings about how timber harvest will be organized and implemented. The HCP provides limits and boundaries that constrain DNR policy in order to protect threatened and endangered species and to ensure adequate water and air quality.

According to the HCP, DNR not only can, but must adjust its policies to comply with the HCP according to a process of scientific adaptive management that it is obligated to implement. In addition, if any DNR management action significantly modifies this agreement with the Federal Services, particularly if the changes adversely impact water quality or critical habitat for endangered or threatened species, the terms of the HCP are broken and DNR logging will be subject to existing requirements for specific take permits and total maximum daily loads (TMDLs).

Therefore, there are no limitations on possible management alternatives, other than they must assure protection of public resources and interests that is “equal or greater” than that provided by the HCP.

**Response:** The HCP is a long-term land management plan that is authorized under the Endangered Species Act and prepared in partnership with the Federal Services. The HCP describes, in a suite of habitat conservation strategies, how DNR will restore and enhance habitat for threatened and endangered species such as the northern spotted owl, marbled murrelet, and salmon in conjunction with timber harvest and other forest management activities. An HCP is required for an incidental take permit.

Having an HCP and incidental take permit does not mean an agency may forego normal enforcement of current environmental regulations. The incidental take permit authorizes incidental take, not the activity that results in take (USFWS 2016a). Forest management activities in the OESF must comply with the HCP *and* the Clean Air Act, Clean Water Act, Forest Practices Act, and other federal and state environmental regulations.

The HCP is a DNR policy because it was adopted as policy by the Board of Natural Resources (Board) (for Board responsibilities, reference RCW.30.215). Subsequent policies that have been adopted by the Board, including the 2004 and 2007 sustainable harvest levels, are compliant with the HCP.

DNR’s alternatives were designed within the bounds of current policies because forest land plans are written at the second, or tactical stage of DNR’s planning process. At this stage, DNR does not change or develop new policies; instead, DNR takes the direction established by state and federal law and policies adopted by the Board and applies it to a specific geographic area, identifying specific local strategies and measurable outcomes (DNR 2006a, p. 45).

Consistent with WAC 191-11-560(1)(b) and Section 3.5.1 of the SEPA Handbook (Ecology 2016) and in response to comments received, DNR developed and evaluated a new action alternative for the FEIS. This new alternative, known as the Pathways Alternative, is a reasonable alternative because it meets the proposal's objectives and stays within the bounds of current DNR policies. Refer to Chapter 2 of the FEIS for a full description of this alternative, and Chapter 3 for analysis of the new alternative.

**No.:** 3

**Topic:** Range of Alternatives and Narrow Objectives

**Source:** Tom Partin, AFRC, page 6

An agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action and the EIS would become a foreordained formality (Northwest Ecosystem v. Rey, 380 F.Supp.2d 1175, 1186 (W.D. Wash. 2005)).

**Response:** DNR's objectives for this forest land plan are based on current DNR policies including the HCP and *Policy for Sustainable Forests*. DNR's objectives remain within the bounds of current policies because adding or changing DNR policies is outside the scope of this planning process. Refer to Comment 2 for more information.

**No.:** 4

**Topic:** New Alternative/Harvest on Potentially Unstable Slopes

**Source:** Tom Partin, AFRC, pages 3, 4 and 5; Steve Courtney, Interfor, page 2

Per conversations with DNR, we gathered that unstable slopes account for 61,921 acres of the 110,832 acres deferred for the next 100 years. Our impression is that most of these acres are 30- to 50-year-old overstocked plantations that, because they are in the stem exclusion stage, may not develop significant habitat value for 150 years or more and do not contribute to meeting the 20/40 habitat objective. Taking 62,000 acres of what is not now, and will not become, habitat off base for 100 years places an unfair and inappropriate burden on the remainder of the OESF state trust lands to meet the 20/40 habitat objective, and results in a significant additional amount of the operable uplands being left without management or with management that is not likely to generate significant commercial production. We do not believe that this outcome would be consistent with DNR's trust responsibilities.

We can find no policy that specifically precludes all management of stands on unstable slopes in the OESF. If DNR does have a policy that requires taking nearly 62,000 acres of unstable slopes off base that do not contribute to conservation, the Board of Natural Resources should reconsider that policy. The experimental nature of the OESF and its mission to learn how to better integrate conservation with commercial forestry implied that DNR would be able to manipulate areas of the land base that are not suitable for intensive forestry, in order to enhance the contribution of those areas to wildlife conservation. Activities such as variable density thinning can be done carefully, after expert review, to bring these areas to a condition in which they may contribute to the 20/40 habitat objective while also providing revenue. With today's science and technologies, this is not beyond the realm of possibilities.

Therefore, DNR should include one or more alternatives that look at managing non-Old Forest stands on unstable slopes to create the required habitat as quickly as possible, by the use of variable density thinning or other light-touch methods. The alternative should, as a result, free up any operable uplands that are not required to meet conservation objectives to instead be used for commercial forestry. These acres should be scheduled for harvest in the model to determine the contributions or impacts that harvesting these acres might have.

**Response:** Consistent with WAC 191-11-560(1)(b) and Section 3.5.1 of the SEPA Handbook (Ecology 2016) and in response to comments received, DNR developed and evaluated a new action alternative for the FEIS called the Pathways Alternative. Under the Pathways Alternative only, DNR will assign management pathways to landscapes to meet its objectives.

One of the pathways is to thin areas of non-habitat in deferred areas to encourage their development into Young Forest Habitat. This pathway will not be applied to all landscapes, nor will it apply to all stands within deferred areas. In landscapes in which this pathway does apply, DNR will select only those stands that are likely to respond well to thinning, for example those that have many habitat attributes already but have too many trees per acre to function as habitat. Some of these stands may be located on potentially unstable slopes. DNR will follow the forest practices rules (WAC 222) for thinning in these areas.

**No.:** 5

**Topic:** New Alternative/Exploratory

**Source:** Tom Partin, AFRC, page 6

DNR should consider an option similar to that used in the South Puget HCP Planning Unit forest land plan, which is to create an exploratory alternative which looked at potentially increasing opportunities for experimentation (for example, harvesting in old-growth forests and on unstable slopes) and increasing harvest levels in the OESF. We understand this may require changes to DNR policy and procedures. This alternative could serve to contrast a less stringent regulatory operating environment with the current proposal. This contrast would also serve to frame the opportunities given up by the beneficiaries in the HCP for expected long-term guarantees of returns.

**Response:** Experimental harvest in old-growth forests is allowed, but not required by current policy: “DNR may conduct operations in old-growth stands consistent with the requirements of DNR’s *Habitat Conservation Plan* to meet the research objectives of the Olympic Experimental State Forest” (DNR 2006a p. 34). Prudent management of forested state trust lands in the OESF involves deferring some areas, and retention of old-growth forests to support ecological objectives is a sound practice. DNR may conduct observational studies in old-growth forests in the future to better understand how these forests function.

Refer to Comment 5 for a discussion on potentially unstable slopes.

DNR is not proposing to change the sustainable harvest level through this forest land planning process. The sustainable harvest level will be decided through the sustainable harvest calculation, which is a separate planning process.

**No.:** 6

**Topic:** New Alternative/Maximize Revenue

**Source:** Carol Johnson, NOTAC, page 1; John Gold, Sierra Pacific, pages 2 and 3

NOTAC prefers the Landscape Alternative. However, both NOTAC and Sierra Pacific recommend that DNR develop a third alternative that maximizes long-term beneficiary revenue while still fulfilling state and federal laws. Only then can the public and the trust beneficiaries determine if the preferred alternative adequately achieves the goals of the OESF.

**Response:** Long-term beneficiary revenue is dependent on the sustainable harvest level, which is determined each decade through a separate planning process. This forest land planning process will not affect the sustainable harvest level. For more information, refer to Comment 52.

**No.:** 7

**Topic:** Adequacy of Alternatives

**Source:** OFCO (summary) page IV, and David Mann, OFCO, pages 2 through 5

The RDEIS is vastly improved. It is clear that DNR read and responded to many of our comments on the DEIS. However, the RDEIS fails to consider an alternative that actually complies with the HCP and feasibly attains the proposal's objectives. First, the RDEIS does not satisfy the requirements for establishing and meeting the marbled murrelet LTCS, and the current interim strategy precludes conservation options for the marbled murrelet. Second, the proposed forest land plan does not meet the riparian conservation strategies in the HCP and will not be protective of bull trout, primarily due to reduced buffer width, lack of exterior buffers, and increased activities within the buffers. Third, the forest land plan provides no evidence that northern spotted owl habitat will be maintained and restored in sufficient quantity, quality, or distribution to ensure conservation of the Olympic subpopulation of the northern spotted owl.

The RDEIS must include at least one alternative that can feasibly attain the proposal's objectives, including meeting the requirement of the HCP and protecting marbled murrelets and bull trout. Because it does not, the RDEIS is deficient. It should be withdrawn and, once DNR has adopted the marbled murrelet LTCS, reissued with an alternative that complies fully with the HCP, the marbled murrelet LTCS, and all state and federal laws and trust duties.

**Response:** Section B.4 of the 2006 Settlement Agreement states that "The Department will proceed with forest land planning for the OESF Planning Unit, second in line behind the South Puget Planning Unit." DNR began the forest land plan for the OSEF immediately upon completion of the forest land plan for the South Puget HCP Planning Unit. Once the marbled murrelet LTCS has been completed and approved, DNR will amend the OESF forest land plan if and as necessary.

The existing marbled murrelet conservation strategy was outlined in the HCP. DNR will continue to implement this strategy consistent with guidance provided in the Memorandum for Marbled Murrelet Management Within the Olympic Experimental State Forest,” dated March 7, 2013 until the marbled murrelet long-term conservation strategy for state trust lands in DNR’s six Western Washington habitat conservation planning units has been completed and approved (a copy of this memorandum can be found in Appendix F to the RDEIS or FEIS). Changes to the current strategy, which is considered DNR policy, are beyond the scope of this forest land planning process.

DNR based its alternatives on HCP requirements (as well as all other applicable policies and laws) and consulted with the Federal Services throughout this process. Also, the riparian and northern spotted owl analyses in the RDEIS demonstrated a trend of improving conditions across the OESF over time. The forest land plan itself does not contain any environmental analysis; refer to the RDEIS and FEIS for that information. For more information, refer to Comments 8, 13, 14, and 19.

**No.:** 8

**Topic:** No Action Alternative

**Source:** Don Hamerquist and Janeen Porter, OFCO, page 147

DNR’s current practices do not conform to the letter or spirit of the HCP. The proper “no action” alternative should be to revert to the existing forest practice rules as adapted by the HCP, not to DNR’s current practices in the OESF.

**Response:** DNR’s current practices in the OESF are monitored through its implementation monitoring program, and results are reported annually to the Federal Services through implementation monitoring and annual reports ([http://www.dnr.wa.gov/ResearchScience/Topics/TrustLandsHCP/Pages/lm\\_hcp\\_monitoring\\_reporting\\_main.aspx](http://www.dnr.wa.gov/ResearchScience/Topics/TrustLandsHCP/Pages/lm_hcp_monitoring_reporting_main.aspx)). To date, the Federal Services have not alerted DNR to major issues with its HCP compliance in the OESF.

Per Section 3.3.2.1 of the SEPA handbook, “As the SEPA rules do not define what the no-action alternative must look like, the lead agency has some discretion in its design” (Ecology 2016). The No Action Alternative represents current management practices because those practices would continue if DNR did not develop a forest land plan.

**No.:** 9

**Topic:** Landscape Alternative

**Source:** Gary Bell, WDFW, page 2

We prefer the Landscape Alternative over the No Action Alternative. The Landscape Alternative provides both timber harvest and natural resource protections. Specifically, it provides a more comprehensive evaluation of timber harvest effects on forest ecosystem functions (aquatic and terrestrial) for multiple species, than the current DNR alternative of evaluating timber harvests

one at a time on a local watershed scale. Landscape-level planning and management provides greater species and habitat conservation opportunities and a broader spectrum of forest management options than a site-by-site approach.

**Response:** Thank you for your comment.

**No.:** 10

**Topic:** Cost/Benefits of Alternatives

**Source:** Carol Johnson, NOTAC, page 2; Tom Partin, AFRC, page 10

There should be clear accounting of the cost/benefits of both alternatives so that the general public and trust beneficiaries know what the ecological costs will be. We would like to see a decade-by-decade schedule of expected trust beneficiary revenue for the two considered alternatives. Can you also explain and show any changes to harvest volumes by trust between the two alternatives?

**Response:** Harvest volume and trust beneficiary revenue are closely related, and both are affected by the sustainable harvest level. The sustainable harvest level would be the same under any alternative. The sustainable harvest level for the OESF is not regulated by trust, and is determined through a separate planning process. Refer to Comment 55 for more information.

## ■ Subject 2: Analysis Methodology

**No.:** 11

**Topic:** Impact Ratings

**Source:** David Mann, OFCO, page 4

The true relative impact of the proposed forest land plan is largely masked by the process followed to conduct the environmental analysis in Chapter 3 of the RDEIS. The RDEIS analysis is based on a process that, instead of comparing relative impacts of the two alternatives, attempts to lump relative impacts into broad, arbitrarily and ill-defined “impact ratings.” By assigning arbitrarily definitions for “low, medium, and high” impact ratings, the RDEIS lumps a range of impacts into one of the three arbitrary categories. And then, by comparing the No Action alternative with the Landscape Alternative based only on the broad impact rating categories, the RDEIS creates the illusion that the relative impacts between the two alternatives are similar or the same. By masking the relative impacts in this way, the RDEIS fails to clearly explain that the relative impacts are often worse for the Landscape Alternative than the No Action Alternative.

**Response:** In an effort to be as objective as possible, DNR performed a highly structured, quantitative analysis using outputs of the analysis model. DNR provided results in charts and graphs to make it easier for commenters to understand and compare the analysis results for each alternative. DNR also provided a summary of the results in each section.

To complete this analysis, DNR defined specific, numeric thresholds at which impacts would be high, medium, or low for each indicator. This step is necessary for a quantitative analysis. Whenever possible, DNR based these thresholds on current science and provided citations. However, for some indicators, no specific scientific criteria was available in the current literature for setting an impact threshold. In these cases, DNR based its thresholds on professional, expert judgment. Each topic in the RDEIS was then peer reviewed by in-house specialists or specialists external to the agency.

In most cases, impact levels are similar under either alternative. The results for the alternatives are similar because the alternatives are designed to implement (not change) current DNR policies.

## ■ Subject 3: Characterization of State Forest Lands

**No.:** 12

**Topic:** Distinction Between State Lands and State Forest Lands

**Source:** Peter Goldman, OFCO, pages 130-141

In its RDEIS and Appendix A to the RDEIS (draft OESF forest land plan), DNR equates, legally and managerially, the State Forest Lands defined in RCW 79.02.010(13) with the State Lands defined in RCW 79.02.010 (14). This is incorrect because it implies that the State Forest Lands must be managed under the same fiduciary standards as the State Lands. The forest land plan must be corrected to clarify that programmatic and timber sale management decisions with respect to the State Forest Lands are not limited by fiduciary concerns applicable to private trusts or to those standards applicable to the State Lands. Instead, DNR has real and substantial discretion to manage the State Forest Lands in the best interest of the state for a variety of benefits, including ecological, aesthetic, recreational, and economic values. DNR must put the state's interest in conservation of all federally-listed species under its HCP ahead of the fiscal interests of the counties or junior taxing district beneficiaries.

**Response:** Appendix A to the RDEIS (draft OESF forest land plan) correctly describes the nature of DNR's trust duty for State Forest Lands and therefore no changes are needed. These lands are held in trust by virtue of state statute; the legislature established a real, enforceable trust that imposes upon the state the same fiduciary duties as are applicable to private trustees, including the duty of undivided loyalty and the duty of prudent management. The key case examining the nature of the trust duty is *County of Skamania v. State*, 102 Wn.2d 127, 685 P.2d 576 (1984). That case held that statutes modifying contracts for the sale of timber from both federally granted lands (State Lands) and the State Forest Lands violated the State's fiduciary duties to the trust beneficiaries. The court acknowledged that the State Forest Land trust was created by statute, but concluded the nature of the fiduciary duty once the trust was established was similar to that for the federal grant lands. "Every court that has considered the issue has concluded that [the federal grant lands] are real, enforceable trusts that impose upon the state the same fiduciary duties applicable to private trustees." *Skamania*, 102 Wn.2d at 132. "The [State Forest Lands] are also held by the state in trust... This statute, like the enabling act, imposes upon the state similar fiduciary duties in the management and administration of [these] lands." *Id.* at 133. The phrase "...in the best interest of the State" was in the statute governing the management of State Forest Lands when the nature of the trust was consider in *Skamania*. Former RCW 76.12.120, recodified as RCW 79.22.050; this phrase does not provide authority for DNR to ignore the fiduciary duties in the management of State Forest Lands.

## ■ Subject 4: Climate Change

**No.:** 13

**Topic:** Additional Analysis of Climate Change

**Source:** Connie Gallant, page 1; Shelly Spalding, OFCO, page 83

Public agencies tasked with guarding our natural resources must take into consideration the environmental changes that our entire planet is going through. Not to pay attention to such changes is myopic and costly, and will only lead to more devastation of our natural resources and wildlife habitat.

We recommend that the FEIS include a section that compares each alternative's long-term protection of threatened and endangered species such as the marbled murrelet, northern spotted owl, bull trout, and Lake Ozette sockeye in the face of climate change. DNR should indicate if the actions that result from the proposed alternatives are likely to sustain populations of these species in the face of expected climate change effects.

A qualitative discussion would add an important component to the decision-making process and improve the public's ability to understand the expected outcomes of the alternatives. A recent publication jointly produced by the Olympic National Forest and Olympic National Park provides a wealth of analysis, scientific information, and recommendations to assist land management agencies with implementing actions that foster adaptation to climate change on the Olympic Peninsula (Halofsky, J.E. et al. 2011).

**Response:** DNR has added a qualitative discussion to the FEIS on how a changing climate may affect state trust lands in the OESF. Refer to "Climate Change" in Chapter 3 of the FEIS.

**No.:** 14

**Topic:** Precautionary Principle

**Source:** Monica Fletcher, Sierra Club, page 2

Climate disruption has placed increased pressure on threatened species and will require the agency to utilize the precautionary principle when making decisions that could strain species recovery.

**Response:** DNR will continue managing the OESF under all applicable state and federal laws and DNR policies. Those policies include the HCP, which includes specific provisions for northern spotted owl, marbled murrelet, riparian, and other types of wildlife habitat.

## ■ Subject 5: Comments on the DEIS

**No.:** 15

**Topic:** Addressing Comments on the DEIS

**Source:** Fawn R. Sharp, Quinault Indian Nation, page 6

The Quinault Indian Nation submitted four separate comments, including one comment in respect to desired future conditions and regarding the DEIS in a letter dated July 15, 2010. The Quinault Indian Nation is uncertain, especially given our joint staff meeting held on June 18, 2013 at Taholah to discuss DNR's work on the RDEIS, whether these previous comments were addressed in the October 2013 RDEIS. In June 2013, the Quinault Indian Nation understood that our 2010 comments would be addressed in the anticipated RDEIS and that the Quinault Indian Nation would have another meeting with the DNR to review and discuss the forthcoming RDEIS prior to issuance of an FEIS. We recognize that DNR has offered to reconvene to discuss the RDEIS and to provide additional time for Quinault Indian Nation to comment on the RDEIS prior to DNR's finalization of the FEIS and request DNR's confirmation of that.

**Response:** The June 2013 meeting was appreciated as an opportunity to better understand the Quinault Indian Nation's major concerns regarding the DEIS analysis. DNR considered the Nation's comments, along with all other comments received, in revising the DEIS, particularly the riparian analysis. With these changes, DNR endeavored to be as responsive as possible within the scope of the analysis.

DNR continues to welcome and encourage a meeting to discuss any questions or concerns on the RDEIS.

## ■ Subject 6: DNR Management Objectives

**No.:** 16

**Topic:** DNR’s Management Priorities

**Source:** Don Hamerquist and Janeen Porter, OFCO, pages 148 and 149

Based on both the textual evidence and on our experience, we know that DNR’s management strategy is preoccupied with the objective to “provide a sustainable flow of revenue.” This plan places timber sale income as the top priority and treats the environmental considerations involved in the other five objectives as “constraints on harvest.” It then proposes a range of ways to limit and attenuate these constraints. No adequate approaches to ecological objectives have been implemented to date in the OESF, and none are suggested in this document. Nor does this document recognize DNR’s past failures.

“Sustainable revenue” is not a separate and overriding goal. To answer the question of what rate of harvest might make the management of state forest lands sustainable, we must be clear on what we intend to sustain. The sustainable rate of harvest is the rate that is consistent with maintaining and improving essential ecological processes. Sustaining a functioning old forest ecology on state-owned forest land will provide the greatest benefits to the actual owners of these lands: the people of the state. Some of these benefits may appear to be extra-economic in the short run, but all will eventually expand and generalize economic well-being. This understanding makes setting the sustainable rate of harvest a political and ecological issue, not a simple matter of economic bookkeeping. This conception of sustainability would link DNR’s first management objective, sustainable harvest, to the adequate implementation of DNR’s ecological objectives. Only the even-handed implementation of all management objectives is compatible with genuinely sustainable outcomes.

**Response:** The Washington State Legislature designated DNR as the manager of state trust lands and directed it to manage these lands to produce perpetual income for the trust beneficiaries. In 1984, the Washington State Supreme Court addressed the state trust relationship in *County of Skamania v. State*, 102 Wn.2d 127, 685 P.2d 576 (1984). The Court found that a trustee must act with undivided loyalty to the trust beneficiaries to the exclusion of all other interests and must manage trust assets prudently (DNR 2006a p. 15). Managing trust assets prudently includes keeping the forest ecosystem healthy and productive.

Maintaining a functioning old forest ecology on state trust lands, with little timber harvest, would not enable DNR to fulfill its obligation to the trust beneficiaries and would not meet DNR’s purpose and need for this forest land plan. However, DNR has deferred from harvest existing old-growth forests, and also maintains a proportion of each landscape as northern spotted owl habitat. As well, DNR seeks to increase the structural complexity of managed stands across the OESF to better support biodiversity.

**No.:** 17

**Topic:** DNR’s Revenue Objective

**Source:** Don Hamerquist and Janeen Porter, OFCO, page 148

We are not clear if the language DNR used in this RDEIS (“sustainable flow of revenue”) marks a change from traditional DNR policy that has aimed at a sustainable rate and volume of timber harvest. Clearly revenues from harvests will fluctuate depending on market prices, variations in methods, costs of production, the age and species of the harvested timber, etc. This approach is likely to mask a failure to account for the total costs of production, and particularly of those costs that are externalized to the environment and eventually paid by the general public. Nor will this approach properly factor in other potential economic benefits, some of which may be indirect, that might accrue from less intensive or differently organized approaches to timber harvest.

**Response:** DNR’s objective for a “sustainable flow of revenue” is an expression of its fiduciary responsibility as a trust lands manager. This objective is based on the *Policy for Sustainable Forests*, which states that “the fiduciary aspect of trust management requires DNR to manage these lands to produce perpetual income for the beneficiaries (the trusts)” (DNR 2006a, p. 15). By “sustainable flow” DNR is not implying an amount of revenue that does not fluctuate over time; nor does DNR imply specific financial targets. Instead, DNR is stating that the flow of revenue must be perpetual, which also means it must be sustainable.

To provide a sustainable flow of revenue, DNR provides a sustainable volume of *timber*. To provide a sustainable volume of timber, DNR calculates a sustainable harvest level each decade through a separate planning process. In the calculation, DNR considers numerous factors, including potential environmental impacts, ability to meet ecological objectives, and fairness to all generations of trust beneficiaries: “In order to ensure intergenerational equity among beneficiaries, within each sustainable harvest unit, the department shall calculate an estimated multi-decade harvest level such that the mean annual timber volume for any decade should not vary up or down more than 25 percent from the level of the preceding decade...” (DNR 2006a, p. 29).

A less intensive or differently organized approach to timber harvest may imply a lower harvest level. DNR would like to reiterate that the harvest level is not set through this forest land planning process.

## ■ Subject 7: Experimental Forest

**No.:** 18

**Topic:** Regulatory Framework

**Source:** Don Hamerquist and Janeen Porter, OFCO, page 153

There is no basis to continue handling the OESF as a separate “experimental” area of DNR management of forested state trust lands. No special regulatory framework has been justified for the OESF, certainly not one that is even less protective than the HCP. The OESF should be placed under the same rules and procedures as are applied to other forested state trust lands and the record shows that DNR’s compliance with these rules and procedures in this area requires rigorous and independent monitoring.

**Response:** The experimental nature of the OESF was first defined in the 1989 *Report of the Commission on Old Growth Alternatives for Washington’s Forest Trust Lands*. It was later confirmed in the *Olympic Experimental State Forest Act* (Title II of P.L. 102-436, signed October 23, 1992 (106 Stat. 2217)), which stated that DNR would contribute to the conservation of northern spotted owl habitat and the protection of old-growth resources through an experimental management program on state-owned lands on the western Olympic Peninsula (USFWS 2016b). The OESF was formally established as an experimental forest in DNR’s 1992 *Forest Resources Plan*, and later confirmed as such in both the HCP and the *Policy for Sustainable Forests*. Changing the nature of the OESF would require a change in policy, which is outside the scope of this forest land planning process.

Management in the OESF has been, and will continue to be guided by the HCP as well as the forest practices rules and other applicable laws. For information on DNR’s research and monitoring program, refer to Chapter 4 of the draft OESF forest land plan (Appendix A to the RDEIS).

**No.:** 19

**Topic:** DNR’s Policies

**Source:** OFCO (summary), page iv

There is an irresolvable contradiction between drafting a plan for an experimental forest, and basing it on current policies that are not experimental.

**Response:** DNR’s policies (for example, the HCP, *Policy for Sustainable Forests*, and sustainable harvest level) define DNR’s basic operating philosophy, set standards and objectives, and provide direction on which subsequent decisions can be based. All policies are written in the context of state and federal laws, and are approved and adopted by the Board of Natural Resources. DNR’s policies, of themselves, are not experimental, because policies simply provide objectives and guidance. Experimentation lies in *how* these policies are implemented. In the OESF, DNR will implement its policies through an experimental management approach called integrated management. Refer to the draft OESF forest land plan (Appendix A to the RDEIS) for more information.

## ■ Subject 8: Fish

**No.:** 20

**Topic:** Listing of Individual Salmon Stocks under the Endangered Species Act

**Source:** Mike Haggerty, OFCO, page 37

Appendix P, page P6 states, "While individual salmon stocks are not eligible for listing under the Endangered Species Act, information on their status is available from a variety of sources." This statement is false. Individual stocks, if they compose an evolutionarily significant unit (ESU), are eligible for listing under the Endangered Species Act. For example, Lake Ozette sockeye are a "stock," the entire ESU is composed of one stock, and the ESU is listed as threatened under the Endangered Species Act.

**Response:** The text in Appendix P has been corrected to reflect that individual salmon stocks are eligible for listing under the Endangered Species Act. As stated in 56 FR 58612 (Nov. 20, 1991), *Policy on Applying the Definition of Species Under the Endangered Species Act to Pacific Salmon*:

"The Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq. (ESA) defines "species" to include any "distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." ... A salmon stock will be considered a distinct population, and hence a "species" under the ESA, if it represents an evolutionary significant unit (ESU) of the biological species. The stock must satisfy two criteria to be considered an ESU: (1) It must be substantially reproductively isolated from other conspecific population units; and (2) it must represent an important component in the evolutionary legacy of the species. Only Pacific salmon stocks that meet these criteria will be considered by NMFS for listing under the ESA."

**No.:** 21

**Topic:** Population Status

**Source:** Mike Haggerty, OFCO, page 37

The text within the main section of the document is somewhat misleading. The RDEIS states, "Although the waters of the western Olympic Peninsula contain several federally listed and state sensitive populations of fish (refer to Appendix P), overall, this area maintains a greater proportion of robust fish populations than many other locations on the Pacific coast (Huntington and others 1996). Salmon and steelhead trout (including wild populations and those augmented by fish hatcheries) support thriving tribal and sport freshwater fisheries managed jointly by WDFW and western Washington tribes."

This may be true for some portions of the Washington Coast but is definitely not true for populations/stocks from Lake Ozette north to the Waatch River around Cape Flattery and east to Deep Creek. Within this portion of the OESF, there are limited or no salmon and steelhead fisheries. Numerous stocks are characterized as having a depressed or critical status. This is partially captured within Appendix P but not presented within the context of the main document.

Appendix P lists 29 stocks (excluding those in the table listed as unspecified spawn timing) within this portion of the OESF that are listed as having a status of critical or depressed.

**Response:** Table P-2, found in Appendix P to the RDEIS, summarizes the status of salmon stocks within the OESF, including the area in question (Lake Ozette to Deep Creek). The subsection titled “What is the Status of Fish in the OESF?” on page 3-137 of the RDEIS acknowledged that several fish populations are either federally listed (as threatened or endangered) or considered to be of special concern and refers the reader to Appendix P. In preparing the RDEIS, DNR aimed to reduce the length of the environmental impact statement by placing supporting information, such as this table, in appendices rather than the main body of the document.

**No.:** 22

**Topic:** Bull Trout Distribution in OESF

**Source:** Shelly Spalding, OFCO, page 107

Bull trout have been found in streams throughout the OESF, including Cedar, Mosquito, Goodman, Matheny, and Kalaloch Creeks as well as the Hoh, Calawah, and Queets Rivers. New sightings of bull trout in streams where they previously were undocumented continue to occur, and current distribution information may not reflect the extent of their presence within the OESF.

**Response:** For the FEIS, DNR assessed potential impacts to riparian areas and fish (including bull trout) using several indicators of riparian function: large woody debris recruitment, peak flow, stream shade, fine sediment delivery, coarse sediment delivery, and leaf and needle litter recruitment. The spatial scale, “area of influence,” and the stream reaches included in the impact analysis varies according to the indicator in question, but DNR believes that its analysis is sufficiently broad to adequately cover all known or suspected bull trout habitat in watersheds in which it manages enough of the watershed to have an effect on riparian functions and processes.

For example, for large woody debris recruitment, stream shade, and leaf and needle litter recruitment, DNR considered all streams (both fish-bearing and non-fish-bearing) that cross state trust lands within Type 3 watersheds that contain at least 20 percent state trust lands. For peak flow, DNR considered all fish-bearing streams (Type 1 through 3) and some non-fish-bearing streams (Type 4) within those same watersheds. For fine and coarse sediment delivery, DNR analyzed all DNR-managed lands within landscapes or watershed administrative units.

In addition, for the analysis of stream shade DNR incorporated temperature thresholds tailored to various salmonid life history stages or species. This analysis addressed bull trout distribution using two data sources: 1) the “char spawning and rearing” aquatic life use category as codified in the Washington State Surface Water Quality Standards (WAC 173-201A); and 2) 2010 NOAA Fisheries bull trout critical habitat.

**No.:** 23

**Topic:** Bull Trout Habitat Requirements

**Source:** Shelly Spalding, OFCO, page 107

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, proximity to hyporheic zones, spawning and rearing substrate, and migratory corridors (Goetz 1989; Howell and Buchanan 1992; Rieman and McIntyre 1993, 1995).

**Response:** DNR respectfully submits that its analysis adequately addressed the specific habitat requirements of bull trout. Given the complexity of many ecological responses and limitations on available data, DNR relied on surrogates as indicators of ecological function or habitat quality. For bull trout, DNR assessed water temperature by examining stream shade; forest cover by examining large woody debris recruitment; channel form and stability by assessing large woody debris recruitment, peak flow, and fine and course sediment delivery; and spawning and rearing substrate by examining fine and course sediment delivery. Each riparian and fish analysis incorporated a channel sensitivity rating, which considers confinement (a measure of valley form).

DNR's analysis did not address proximity to hyporheic zones, as suggested by the commenter. The data required for such an analysis, including detailed mapping of channel morphology and instream large woody debris across the entire OESF, is not available. Instead, by implementing its riparian conservation strategy, DNR aims to prevent its land use practices from influencing channel morphology.

**No.:** 24

**Topic:** Required Protections for Bull Trout

**Source:** Shelly Spalding, OFCO, page 107

Bull trout were listed by 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 (PRT 812521 Amendment Biological Opinion [bull trout]) on DNR's 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 forest land plan for the specified stream types.

**Response:** The OESF riparian protections described in PRT 812521 Amendment Biological Opinion (bull trout) are a summary of those presented in the HCP. The PRT 812521 Amendment Biological Opinion (bull trout) incorporates the HCP by reference, and refers the reader to the HCP for a complete description of the covered activities and bull trout mitigation measures.

The proposed forest land plan is based on current DNR policies including the HCP and *Policy for Sustainable Forests*, as well as all applicable local, state, and federal laws. DNR therefore submits that the forest land plan is consistent with the PRT 812521 Amendment Biological Opinion (bull trout).

**No.:** 25

**Topic:** Stream Temperature for Bull Trout

**Source:** Shelly Spalding, OFCO, page 107

Habitat components that influence bull trout distribution and abundance include water temperature, cover, channel form and stability, valley form, proximity to hyporheic zones, spawning and rearing substrate, and migratory corridors (Goetz 1989; Howell and Buchanan 1992; Rieman and McIntyre 1993, 1995). 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). Both RDEIS alternatives are predicted to impact stream shade, 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.

**Response:** DNR believes that its analysis of stream shade (used as a surrogate for stream temperature) in “Riparian” and referenced in “Water Quality” in the RDEIS and FEIS adequately addresses the temperature requirements of bull trout.

For the FEIS, DNR’s analysis incorporates a 7-day average daily maximum temperature threshold of 12°C (53.6°F) for bull trout, in accordance with Washington State Surface Water Quality Standards (WAC 173-201A). DNR applied this threshold to all stream reaches on state lands designated as “char spawning and rearing” by Washington State Surface Water Quality Standards (WAC 173-201A) or designated as part of 2010 NOAA Fisheries bull trout critical habitat.

DNR’s analyses indicated that the No Action, Landscape, and Pathways alternatives are not expected to result in probable significant adverse impacts to stream shade. Most Type 3 watersheds were assigned a low impact rating.

**No.:** 26

**Topic:** Hyporheic Zone

**Source:** Shelly Spalding, OFCO, page 108

One of the most important factors affecting bull trout spawning site selection, as well as in maintaining cold water throughout rivers and streams, is the hyporheic zone. Because channel morphology exerts a primary control on shaping the hyporheic zone in mountain stream networks, any process that influences channel morphology also has the potential to influence hyporheic exchange flows. Many land-use activities influence channel morphology (Wondzell et al., 2009). Water temperatures in the hyporheic zone are also typically buffered and lagged, with respect to diel changes in stream temperature. As a consequence, upwelling environments are of special interest because upwelling water has the potential to be thermally or chemically distinct

from stream water. In the Swan River basin in Montana, bull trout spawning site selection was positively correlated with the location of “knickpoints” where hyporheic upwelling tended to occur (Baxter et al. 1999). By only analyzing the impact of stream adjacent shade on stream temperatures, the impacts from both alternatives on bull trout and other salmonids' habitat, especially stream temperatures, are greatly simplified.

**Response:** Stream shade is one of many factors that influence stream temperature. A brief discussion of additional processes, including hyporheic exchange, was presented on page G-56 of Appendix G to the RDEIS.

While land use practices have the potential to influence channel morphology, the resulting effects on hyporheic exchange are complex, especially in low-gradient streams (Wondzell and others 2009). For example, in their simulations of hyporheic exchange following wood removal and the resulting changes in channel morphology in small, low-gradient streams, Wondzell and others (2009) observed an initial decline in hyporheic exchange, followed by a later increase in hyporheic exchange as the stream adjusted to the loss of wood.

Projecting changes in channel morphology and hyporheic exchange as a result of land use practices is beyond the scope of this EIS. Such an analysis would require a detailed mapping of channel morphology and instream large woody debris across the entire OESF. No such data exists. Instead, by implementing its riparian conservation strategy, DNR aims to prevent its land use practices from influencing channel morphology.

Despite decades of research on stream temperature response to forest harvesting, there are still vigorous debates in the Pacific Northwest about the thermal impacts of forestry and how to manage them (Larson and Larson 1996, Beschta 1997, Ice and others 2004, Johnson 2004 as cited in Moore and others 2005). The conventional approach is to retain a forested buffer strip along the stream in an effort to shield streams from an increase in solar radiation, which is one factor driving summertime stream warming (Moore and others 2005).

**No.:** 27

**Topic:** Analysis of Bull Trout

**Source:** OFCO (summary), page iv

The RDEIS omits mention or analysis of impacts on the threatened bull trout and Lake Ozette sockeye, on which the Fish and Wildlife Service has written biological opinions describing needed protections.

**Response:** Both species were analyzed in the RDEIS. Impact analyses for bull trout and Lake Ozette sockeye salmon can be found on pages 3-164 and 3-169 of the RDEIS, respectively.

The current status of both bull trout and Lake Ozette sockeye is described in “What is the Status of Fish in the OESF” in “Fish” in the FEIS.

For the FEIS, DNR analyzed potential impacts to riparian areas and fish using several indicators of riparian function: large woody debris recruitment, peak flow, stream shade, leaf and needle litter recruitment, fine sediment delivery, and coarse sediment delivery. For the indicator stream shade (used as a surrogate for water temperature), DNR incorporated temperature thresholds tailored to various salmonid life history stages or species. In this analysis, DNR addressed bull trout distribution using two data sources: 1) the “char spawning and rearing” aquatic life use category as codified in the Washington State Surface Water Quality Standards (WAC 173-201A); and 2) 2010 NOAA Fisheries bull trout critical habitat.

**No.:** 28

**Topic:** Analysis of Bull Trout

**Source:** Shelly Spalding, OFCO, page 109

There are only two alternatives, and they 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; impacts to groundwater and hyporheic sources, reduced large woody debris recruitment due to removal of source trees; and reduced pool and substrate quality caused by increased sediment delivery.

**Response:** As stated in the HCP, “No specific restrictions on management activities are given in the riparian conservation strategy, other than on road-building” (DNR 1997, p. IV.128). Harvesting in interior-core and exterior buffers can occur, provided that management activities are consistent with the conservation objectives (DNR 1997, p. IV.109, IV.117).

DNR respectfully disagrees that there are no quantitative criteria for assessing the potential effects of harvest activities within the riparian zone on bull trout.

In the FEIS, DNR examined potential impacts to riparian areas and fish using several indicators of riparian function: large woody debris recruitment, peak flow, stream shade, leaf and needle litter recruitment, fine sediment delivery, and coarse sediment delivery. Each indicator is consistent with USFWS recommendations for analysis of baseline conditions and the assessment of potential impacts of proposed actions on bull trout (USFWS 2010b).

**No.:** 29

**Topic:** Sediment Delivery to Streams

**Source:** Shelly Spalding, OFCO, page 108

Bull trout survival and abundance are negatively affected by increased sedimentation in streams. The RDEIS acknowledges that numerous sub-watersheds have potential road sediment impacts that exceed the “high” delivery class of 10 tons per stream mile per year.

**Response:** DNR reported fine sediment delivery in tons per stream mile in the DEIS (DNR 2010). The analysis methodology was updated for the RDEIS and FEIS; in this

updated methodology, DNR did not report sediment delivery in those units. DNR therefore interprets the comment to be a reference to the DEIS.

In the FEIS, DNR analyzed fine sediment delivery using several indicators and identified high impacts for fish (including bull trout habitat) for the No Action, Landscape, and Pathways alternatives. DNR considered such impacts to be adverse, but neither probable nor significant due to mitigation through current management practices. Mitigation is expected to reduce impacts to a level of non-significance, as discussed in the FEIS.

**No.: 30**

**Topic: Large Woody Debris Recruitment**

**Source: Shelly Spalding, OFCO, page 108; Sierra Club, page 2**

As we work to support salmon recovery, stream buffers and forest practices around streams will have significant impacts for salmon recovery. For example, removal of riparian trees reduces stream habitat complexity by decreasing the amount of large woody debris available for recruitment to the stream. Most streams within the OESF area are already lacking in large wood, and riparian prescriptions under the current planning need to address this deficiency by not further reducing future recruitment of large wood to the rivers and streams.

**Response:** DNR assessed the large woody debris recruitment potential within the riparian area through an examination of forest composition and structure, and how it changes over time in response to natural growth and forest management activities. DNR's analysis in the RDEIS and FEIS indicates that the No Action, Landscape, and Pathways alternatives would not result in probable significant adverse impacts to large woody debris recruitment.

**No.: 31**

**Topic: Citations**

**Source: Mike Haggerty, OFCO, pages 44 through 46**

In several places, citations were inaccurate or missing. DNR must take greater care to enclose text within quotes and cite the source appropriately.

**Response:** DNR has modified the text of the FEIS to ensure that all sources are properly cited and attributed.

**No.: 32**

**Topic: Use of Intrinsic Potential Models for Fish Analysis**

**Source: Mike Haggerty, OFCO, page 38; Wild Salmon Center, pages 1 and 2**

DNR identifies essential habitat for non-Endangered Species Act-listed species using published, peer-reviewed intrinsic potential models. DNR's interest in using cutting-edge, locally-reviewed science to help identify essential habitat for wild salmon and steelhead at a landscape scale in the OESF is commendable. However, these models applied to coastal rivers are not sufficiently refined to produce meaningful and useful results, and require substantial work before they should be relied upon to provide meaningful guidance. Although the phase I model was peer reviewed

and resulted in the next model iteration (Phase II), the model itself is still at least three years from being complete.

Participants in the 2-day peer review workshop for the Phase II model in 2013 expressed concern that, while its simplicity is considered a fundamental strength, the model's simplicity may also lead to misinterpretation. Participants felt that the output maps failed to provide immediately meaningful direction regarding the most valuable habitat in most river systems, and the model's power to place requisite value on rearing habitat was unsatisfactory. All agreed that an effort should be made to tailor the model to differentiate spawning and rearing habitat suitability. The final report on the Phase II models (February 2013) also expressed technical concerns regarding modeled life cycle habit, barriers, binning schemas, and spawning areas.

**Response:** DNR updated its method of analyzing potential impacts to fish in the FEIS, in recognition that the intrinsic potential models used in the RDEIS are still under development. For the FEIS, DNR's analyzed potential impacts to riparian areas and fish using several indicators of riparian function: large woody debris recruitment, peak flow, stream shade, leaf and needle litter recruitment, fine sediment delivery, and coarse sediment delivery. With the exception of stream shade (described below), none of these indicators rely on species distributions.

For example, for the indicators large woody debris recruitment, stream shade, and leaf and needle litter recruitment, DNR considered all streams (both fish-bearing and non-fish-bearing) that cross state trust lands within Type 3 watersheds that contain at least 20 percent state trust lands. For peak flow, DNR considered all fish-bearing streams (Type 1 through 3) and some non-fish-bearing streams (Type 4) within those same watersheds. For the indicators fine and coarse sediment delivery, DNR analyze all DNR-managed lands within landscapes or watershed administrative units.

For the indicator stream shade (used as a surrogate for water temperature), DNR incorporated temperature thresholds tailored to various salmonid life history stages or species in accordance with Washington State Surface Water Quality Standards (WAC 173-201A) and supplemented with 2010 NOAA Fisheries bull trout critical habitat.

DNR believes that its analysis is sufficiently broad to adequately cover all known or suspected fish habitat in watersheds in which it manages enough of the watershed to have an effect on riparian functions and processes.

**No.:** 33

**Topic:** Use of Intrinsic Potential Models for Fish Analysis

**Source:** Mike Haggerty, OFCO, page 38

The modeling study was never intended to be used in the fashion DNR used it and was never intended to replace already-ground-truthed data. It is supposed to be used as a guide of where to undertake field work that may not have been conducted yet (anonymous, personal communication, December 2013).

**Response:** DNR updated its method of identifying fish habitat in the FEIS, in recognition that the intrinsic potential models used in the RDEIS are still under development. For additional information, refer to Comment 32.

DNR believes, however, that its use of the intrinsic potential models to identify essential fish habitat in the RDEIS was consistent with their intended purpose and application, as supported by the scientific literature and the accompanying model documentation. Bennett and Wecker (2013), who developed the intrinsic potential models, state in their final report: “Intrinsic Potential (IP) models provide a means to identify at a large scale those portions of the landscape that can provide essential habitat for various fish species.”

DNR’s analysis in the RDEIS was patterned after Burnett and others (2007), who linked intrinsic potential with current and projected future landscape data to assess the effects of management activities on forests adjacent to high intrinsic potential habitat. Burnett and others (2007) concluded that “...landscape projections are valuable for helping decision makers and the public understand how current policies may affect stream habitats and as a baseline for comparing projected effects of alternative policies.”

**No.:** 34

**Topic:** Coho Summer Rearing Intrinsic Potential Model Inaccuracies

**Source:** Mike Haggerty, OFCO, pages 38 through 44

I have reviewed the model outputs and known species/life history uses of channel segments throughout the OESF, and in my professional opinion the intrinsic potential model for all species and life stages is highly inaccurate and a major step backwards (for example, Salmonscape data). In particular, the intrinsic potential model used to identify essential coho summer rearing habitat is incomplete and not peer reviewed nor intended for the application for which it was used.

The literature shows that summer rearing preference is typically below 3 percent (Reeves et al. 1989) but occasionally up to 5 percent (Agrawal et al. 2005). Burnett et al. (2007) states that the index curve for coho salmon declines linearly from 0 percent gradient and assumes no use upstream of reaches with gradients exceeding 7 percent. Yet the intrinsic potential model assumes high intrinsic potential scores for the highest gradient channels (less than 20 percent gradient), often above anadromous barriers.

Within the Clallam River watershed administrative unit, not a single stream segment (not including a 150-foot portion within a segment) was identified as essential fish habitat where the gradient was less than 4 percent (the upper end of preferred habitat range, based on a comparison to SSHAIP and LiDAR data). Within the Clallam River watershed administrative unit, 77 percent of the high intrinsic potential summer rearing coho habitat was also mapped as Type 4 or 5. At the reach scale, 3 percent, 79 percent, and 18 percent of reaches had gradient classes of 4-8 percent, 8-20 percent, and >20 percent, respectively.

In specific examples, several streams I examined in the Clallam landscape that were modeled as essential fish habitat were actually Type 4 streams on the ground, located upstream from fish passage barriers, were high gradient, had poor connections to the mainstem, or were surrounded

by forest that had been clearcut or destroyed by windthrow. If the authors of the RDEIS had compared the model outputs with known facts about the life history of coho salmon, they would have found that the modeled outputs were highly erroneous. In conclusion, for coho summer rearing the essential fish habitat modeling did an excellent job identifying areas not used by coho salmon and did a terrible job identifying coho summer rearing habitat.

**Response:** Upon review, DNR concurs that the intrinsic potential model used in the RDEIS incorrectly identifies high gradient streams as suitable summer rearing habitat for coho salmon. DNR updated its method of identifying fish habitat in the FEIS, in recognition that the intrinsic potential models used in the RDEIS are still under development. For additional information, refer to Comment 32.

**No.:** 35

**Topic:** Coho Summer Rearing Intrinsic Potential Model Conflicts with Hydro Layer

**Source:** Mike Haggerty, OFCO, page 14

The intrinsic potential model DNR used to identify essential coho summer rearing habitat is inconsistent with DNR's water typing system. Approximately 39 percent of the essential coho summer rearing habitat is classified as Type 5 and 79 percent is shown as non-fish-bearing (Type 4, 5, or unknown) on DNR's hydro layer. Only 21 percent of the "essential habitat" for coho is classified as Type 1, 2, or 3 waters. Type 5 waters had the greatest length of channel classified as essential fish habitat. Which is it? How does DNR reconcile these vast differences in their modeling and mapping?

**Response:** Upon review, DNR concurs that the intrinsic potential model used in the RDEIS incorrectly identifies high gradient streams as suitable summer rearing habitat for coho salmon. The inclusion of high gradient streams likely explains the inconsistencies with DNR's water typing system.

DNR updated its method of identifying fish habitat in the FEIS, in recognition that the intrinsic potential models used in the RDEIS are still under development. For additional information, refer to Comment 32.

**No.:** 36

**Topic:** Use of Empirical Data

**Source:** Mike Haggerty, OFCO, pages 37 and 46

It is understandable that DNR does not have comprehensive data on fish distribution and habitat conditions throughout the OESF. The RDEIS uses one complex model, after complex model with little if any actual data to justify the adequacy of forest management activities. Forest management activities contained within the RDEIS should be based, at least in part, on fish distribution, status of stocks within a watershed administrative unit, and habitat conditions. Models which contain little real world data and the use and misapplication of models which yield erroneous results make this portion of the RDEIS unacceptable.

**Response:** The use of computer models for ecological analysis is well established (for example, Benda and others 2007, Welty and others 2002), and is suggested in the SEPA Handbook (Ecology 2016) as a means of analyzing the potential impacts of a proposal

and its alternatives. Ecological processes are complex, as are the models used to represent them.

Given limitations on available data, DNR relied on surrogates as indicators of ecological function or habitat quality. The use of surrogates for ecological monitoring and evaluation is well-established (Murtaugh 1996, National Research Council 1986, Noss 1990, Messer and others 1991). Many of the surrogates DNR used in its riparian analysis, such as large woody debris recruitment, leaf and needle litter recruitment, and stream shade, are based on forest composition and structure, which are measured directly as part of DNR’s forest inventory program. DNR therefore respectfully disagrees with the commenter’s statement that its models contain little real world data.

**No.: 37**

**Topic: Use of Empirical Data**

**Source: Wild Salmon Center, page 2**

Our peer review session convinced us that the current intrinsic potential model output should not substitute for on-the-ground fish data when that information is available.

**Response:** DNR updated its method of identifying fish habitat in the FEIS, in recognition that the intrinsic potential models used in the RDEIS are still under development. For additional information, refer to Comment 32.

**No.: 38**

**Topic: Applying Levels of Risk**

**Source: Mike Haggerty, OFCO, page 37 and 38**

Very highly productive stream reaches should not be treated with the same management prescriptions as less productive or non-productive stream reaches. Not all habitats are equal. Risk from timber harvest to riparian stands should not be equal across all habitats. None of these concepts were incorporated into the draft OESF forest land plan. It makes no sense to apply the same level of risk to all habitat types. Salmonid productivity throughout a watershed administrative unit can be evaluated using multiple methods. For a species like coho salmon, one surrogate for current productivity is spawning density. For multispecies landscape scale approaches, see Haggerty and NOLT (2011).

**Response:** DNR believes that its proposed forest land plan (and related RDEIS and FEIS) is consistent with the HCP, which states that “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 scale” (DNR 1997, p. IV.127).

**No.: 39**

**Topic: Stream Temperature**

**Source: Fawn Sharp, Quinault Indian Nation, page 4**

Because widespread water temperatures qualify as impaired in the Queets River basin and OESF streams, the Quinault Indian Nation questions the fisheries findings in Table ES-6 (p. ES-23) for stream shade and likely other related water quality parameters. The Quinault Indian Nation

believes water temperature exceedances adversely affect multiple species of salmonids, contrary to the draft fisheries determinations in Table ES-6.

**Response:** DNR’s findings in Table ES-6 (p. ES-23) of the RDEIS are based on an analysis of stream shade as a surrogate for stream temperature. DNR did not measure, model, or include stream temperature directly in its analysis. The use of surrogates as indicators of ecological function or habitat quality is well established (Murtaugh 1996, National Research Council 1986, Noss 1990, Messer and others 1991).

DNR’s strategy for meeting state water quality temperature standards is to retain forested buffer strips (buffers) along streams in an effort to shield them from an increase in solar radiation. The width of buffers under DNR’s riparian conservation strategy are consistent with those suggested in scientific literature as sufficient to maintain suitable stream temperatures.

Documented occurrences of water temperature exceedances in areas where buffers were applied in accordance with DNR’s conservation strategy warrant further investigation, and are best addressed through DNR’s OESF research and monitoring program and adaptive management process.

The commenter’s statement of widespread water temperature impairments in the Queets River watershed is based on a data set collected in 2013, after DNR had completed its riparian analysis for the RDEIS. As described in the materials submitted with the public comments:

“Eighty-nine (89) total project thermistors were installed in 2013. Eighty-seven (87) of the eighty-nine (89) thermistors logged sufficient data to compute station 7DADM value. Sixty (60) of the 87 units (68.9%) with 7DADM values were determined to fail either the 12° C or 16° C criteria by at least 0.4° C. Another 3 of the 87 thermistors were determined to have 7DADM values that were within the accuracy specifications of the thermistors (+/- 0.3° C).”

The thermistors (temperature sensors) were installed across a variety of ownerships. Of the 63 that indicated stream temperatures in excess of state water quality standards (3 of which were within the margin of error of the thermistors), it appears that 14 were located on DNR-managed streams.

In 2012, DNR initiated a riparian status and trends monitoring project in the OESF, which includes continuous stream temperature monitoring and calculation of 7DADM. DNR’s monitoring includes 23 sample basins in the Queets River watershed, although none are coincident with the sites monitored by the Quinault Indian Nation.

**No.:** 40

**Topic:** Restoration of Fish Habitat

**Source:** William Spring, page 1

The RDEIS prediction of 50 years in order to attain the restoration threshold for fish habitat in the stream and riverine habitats for anadromous fish is unacceptably excessive, and could be expedited by full and immediate implementation of the HCP prescriptions for full, undiminished interior and exterior riparian zones. Species facing extinction cannot wait many decades before meaningful improvement in their habitat is achieved through slow increments in DNR forest practices. Reducing these zones as proposed by DNR is unconscionable, in view of the perilous states of most salmonid native stocks on the Peninsula. The proposed revisions should be rejected as contrary to the objectives of the OESF in regards to forest health and fish survival and viability.

**Response:** The current condition of riparian forests on state lands in the OESF is primarily the result of timber harvests that occurred prior to the implementation of the HCP. Between 1970 and 1990, much of the forests that influence riparian function were clearcut. While regrowth has occurred, many of these areas are currently in the Competitive Exclusion stand development stage.

During the Competitive Exclusion stage, stand density typically reaches its maximum. Competition for limited resources, such as light, nutrients, and growing space, is high. Many trees in the stand may decline in growth and eventually die as competition intensifies (Franklin and others 2007). While some stand-level parameters such as basal area or standing volume increase at their maximum rate during the Competitive Exclusion stage because of the sheer number of trees, individual tree growth is generally depressed.

As a result, stands in the Competitive Exclusion stage often lack the large trees, snags, multiple canopy layers, and significant large woody debris found in more structurally complex forests (Bigley and Deisenhofer 2006). The woody debris these forests provide currently consists of small diameter pieces, which decay faster, are less stable in the stream channel, and are less likely to influence instream habitat.

In general, large woody debris recruitment potential is projected to improve across most stream reaches on state trust lands in the OESF (refer to “Riparian,” RDEIS, p. 3-67), resulting in a reduction in the amount of essential habitat in a high impact condition. However, the change is projected to be slow, primarily because over half of the areas currently in the Competitive Exclusion stage also are deferred from harvest. An analysis of the results of DNR’s analysis model has shown that, in the absence of management, stands in the Competitive Exclusion stage may remain in this stage for 50 years or more.

## ■ Subject 9: Forest Conditions

**No.:** 41

**Topic:** Determination of Impact Levels

**Source:** Tom Partin, AFRC, page 7; David Montgomery, Ph.D., OFCO, page 81

There is a high degree of apparent arbitrariness in DNR’s definitions for high, medium, and low impacts (pages 3-24 to 3-25). In setting a 10 percent threshold of high impact area in a watershed as a low impact, and up to a 20 percent threshold of high impact area as a medium impact, the analysis explicitly discounts the rationale behind the state’s watershed analysis in previous decades: that the potential landscape-scale impact of an activity depends not only on how much of the landscape is covered by that activity, but on where in the landscape it occurs. If high-risk activities occur on a small area of vulnerable ground, they can have a disproportionate impact on the landscape. This is a basic principle of watershed analysis that seems to be explicitly ignored in DNR’s method for "computing" a high, medium, or low impact.

Also, there is no substantive discussion on how DNR determined the combinations of forest stand entries and their impact (page 3-24 of the RDEIS), beyond DNR considering four or more entries in the planning period of 100 years to have a high impact (page 3-92 of the RDEIS). The tables shown in Appendix E (Tables E-13 to E-23) all seem to indicate entries of 3 or more as having a high impact. Yet there is no explanation for this variance from the discussion of 4 or more entries on page 3-92.

Additionally, these tables do not explain how DNR determined the acres with no entry. It seems logical to assume these acres would be made up of the deferred acres. However, from a comparison of these acres with Table A-18 in Appendix A (draft OESF forest land plan), we could not find a correlation between no entry acres and deferred acres. It is possible these no entry acres also include the “operable but unscheduled” acres, but we found nothing in the document to explain this discrepancy.

**Response:** An analysis that examined where impacts would occur within a watershed would be a site-specific analysis. DNR did not conduct a site-specific analysis of the forest land plan. The RDEIS is an analysis of a non-project action (development and implementation of a forest land plan). Non-project actions include the adoption of plans, policies, programs, or regulations that contain standards controlling the use of the environment, or that regulate or guide future on-the-ground actions. Future management actions depend, in part, on the decisions made in this planning process, but no specific on-the-ground activities are designed as part of this process. The site-specific impacts of timber sales are analyzed at the time they are proposed through a separate SEPA process. Instead, DNR analyzed trends over time and across large areas (such as a landscape or watershed administrative unit).

In the RDEIS, DNR analyzed forest stand entries separately under two topics: forest conditions and soils. The forest conditions analysis was meant as a general assessment of harvest intensity. For that analysis, DNR assigned impact levels based on combinations of thinning and variable retention harvest entries. A high impact could

occur from several combinations, including three variable retention harvests or two variable retention harvests and two or more thinning entries over the 100-year analysis period. The soils analysis was specific to soil compaction, erosion, displacement, productivity, and landslides. For that analysis, DNR did not believe a distinction needed to be made between harvest types since both harvest types likely would involve moving heavy equipment over the soil. Based on professional judgment, DNR set four or more harvest entries over 100 years as a reasonable benchmark for a high impact.

The acres with zero harvest entries are a combination of deferred areas and areas that are operable but not scheduled for harvest under the analysis model's optimal solution. For more information on operable acres not scheduled for harvest, refer to Comment 63.

**No.:** 42

**Topic:** Mitigation

**Source:** Gary Bell, WDFW, page 3 and 4

Table 3-15, page 3-39 clearly demonstrates that the Landscape Alternative will potentially result in more high impacts within the Clallam, Coppermine, Kalaloch, and Reade Hill landscapes, with an overall 3 percent increase in high impacts. The discussion following this table recognizes the potential environmental impact for the Landscape Alternative with this indicator (harvest methods and number of forest entries), but does not consider it significant in consideration of the entire OESF landscape. The RDEIS only offers possible mitigation to reduce the potentially high impacts in the most impacted landscape (Clallam). There appears to be no commitment by DNR to address this situation in Clallam or any of the other anticipated higher-impact landscapes. Possible mitigating measures may include reduced stand entries, reduced management activities, or lengthened harvest rotations. We strongly suggest development of landscape-specific mitigation options along with a real commitment by DNR to implement mitigation as necessary (adaptive management) over time.

**Response:** DNR suggested mitigation for the Clallam landscape under the Landscape Alternative because impacts were rated as high in that landscape. DNR did not suggest mitigation for the other landscapes because impacts in those landscapes were rated as medium or low.

The number of forest stand entries is closely related to the sustainable harvest level. The harvest level analyzed in the RDEIS does not reflect the current sustainable harvest level; refer to Comment 52 for a full explanation. The sustainable harvest level for the OESF is not set through this forest land planning process. The level is set through the sustainable harvest calculation, which is a separate planning process.

*No.:* 43

*Topic:* Harvest Level in Clallam landscape

*Source:* Mike Haggerty, OFCO, page 27, 28, and 29

The Clallam has the highest rate of timber harvest of all landscapes. The proportion of harvested stands over 90 years old significantly increased during the recent implementation period (2007 to present). The proportion of stands greater than 90 years old that were clearcut went from 10 to 43 percent.

If you look at the proportion of the "forested" landscape you will see that the Clallam landscape represents 6.7 percent of the OESF. The total percent of variable retention harvest in the OESF that is proposed to come from the Clallam is 8.9 percent, and combined variable retention and thinning is 9.7 percent. This harvest is 33 percent and 45 percent greater than the percent of the forested landscape contained within the OESF. The Clallam landscape under the Landscape Alternative is considered to have high potential impacts (Table 3-15, RDEIS page 3-39). That is, more than 20 percent of the area is rated as having potential high impacts. It seems unlikely this amount of harvest complies with the intent of the HCP.

**Response:** The amount of harvest that the analysis model schedules in the Clallam or any other landscape is based on a number of factors, including but not limited to current conditions, projected growth, financial value versus costs, and ecological objectives such as the 20/40 northern spotted owl habitat thresholds. The combined effect of all of these factors is more harvest in some landscapes than in others over time. The model does not attempt to balance harvest across landscapes.

The projected number of forest stand entries in the Clallam landscape is based on a model that was not constrained to the current sustainable harvest level; refer to Comment 52 for a full explanation. The actual number of forest stand entries will depend on the sustainable harvest level, which is recalculated every 10 years in a separate planning process.

## ■ Subject 10: Forest Estate Model

**No.:** 44

**Topic:** Peer Review

**Source:** Chris Mendoza, Mendoza Environmental, LLC, page 10; OFCO (summary), page iv

The forest estate model used for the Landscape Alternative is internal to DNR and is not available for peer review. DNR should have its version of the forest estate model independently reviewed by the University of Washington School of Forest Resources modeling experts. Include the “post process” additions that were not part of the forest vegetation simulator – Pacific Northwest (for example, in-growth stocking levels, marbled murrelet nesting platforms resulting from “edges,” etc.).

**Response:** The analysis model is available for peer review and is also documented in Appendix D of the RDEIS. To build the analysis model, DNR used the Spatial Planning System, a commercial software package developed by Remsoft, Inc. The analysis model represents several years of collaboration with technical staff from the University of Washington and other stakeholder groups.

**No.:** 45

**Topic:** Dynamic Forest Estate Model Outputs

**Source:** Tom Partin, AFRC, page 7

We understand the need to show outputs for modeled volumes, acres by treatment, etc., but greater effort needs to be made to explain that many of these numbers will change over time with updated runs of the model. This is particularly the case with the “operable but unscheduled acres” description. It is too easy for these numbers to become expectations rather than just the model result at this particular point in time. DNR should provide a much more explicit and concise explanation in the FEIS about how these values are dynamic and will change over time with successive model runs.

**Response:** DNR has removed all of this information from the draft OESF forest land plan because it was based on the outputs of the analysis model. The analysis model was used for environmental analysis; DNR will not use it as a tool during implementation. During implementation, DNR will use the tactical model (refer to Comment 46 for more information).

**No.:** 46

**Topic:** Rerunning the Forest Estate Model

**Source:** William Fleck, City of Forks, page 5

In the draft OESF forest land plan’s description of the steps associated with silvicultural management, there appears to be reliance on the model’s optimization of proposed activities, particularly in Step 2. However, what occurs if the field forester is unable to bring forward a stand for harvest in substantially the same volume and size as projected in the model? Is this unavailable volume simply left out of the offering, or does the field forester attempt to

reconfigure the proposed sale to meet environmental and volume requirements associated with the proposed action? Both the draft OESF forest land plan and the RDEIS are silent on this point, particularly on page 65 of the plan. If the model is being recalibrated on a regular basis within the sustainable harvest decade, then this shortfall may be transitory in nature. However, if the model is not recalibrated until the half-way point or at the end of the decade, a significant arrearage may result, having immediate, and arguably harmful, economic impacts upon the beneficiaries relying on the volume and revenue associated with the proposed harvests. The City recommends that the forest land plan specifically call out the points in each sustainable harvest decade at which the model will be re-run/recalibrated as referenced within Step 7 of the forest land plan’s seven-part timber sale implementation process.

**Response:** DNR tracks its progress toward meeting the sustainable harvest level on a continual basis.

For implementation of the forest land plan, DNR will develop a forest estate model called the tactical model. The tactical model will be used to develop a harvest schedule, which is the model’s recommendation of where, when, and by what method to harvest forest stands to meet DNR’s revenue and ecological objectives.

The harvest schedule provides foresters a starting point for determining where to harvest. Foresters will begin each timber sale by doing an office review and field reconnaissance of the areas currently recommended by the model for harvest. When a forester determines that a sale suggested by the tactical model is not viable, the forester either will reconfigures the sale (if possible) to make it viable or return to Step 1 of the timber sale implementation process, which is to review model outputs and select a stand for field reconnaissance. DNR periodically will update and rerun the tactical model.

**No.:** 47

**Topic:** Role of Forester

**Source:** Steve Courtney, Interfor, page 3

How will DNR balance the use of the model as a planning tool with foresters’ local knowledge and on-the-ground experience? In instances where inventory data is not a true reflection of on-the-ground stand conditions, will foresters have the ability to make forest management decisions? We are concerned the model will restrict the timber sale planning process and take away land managers’ abilities to use their local knowledge and experience.

**Response:** The model is only a tool and will never replace the role of foresters and managers and their boots-on-the-ground observations. Although the model provides recommendations on where and how to harvest, final decisions are made by foresters (with approval from managers) based on field-verified conditions.

**No.:** 48

**Topic:** Model Validation

**Source:** Chris Mendoza, Mendoza Environmental, LLC, pages 8 and 9

A key limitation of growth and yield models is the time that has passed since information was collected from forest inventory units (FIUs) on OESF lands, and the number of years that this

information is projected forward (for example, 50-100 years). Projecting stand conditions farther into the future has limitations based on the relatively short amount of time growth and yield models have been developed and utilized relative to the age of the forest one is trying manage. The FIU field data taken within the past five years will better reflect growing conditions than FIU data taken in 1995. To that end, DNR could take a subsample of older FIU plots located within the OESF to validate stand conditions projected by the forest estate model to validate assumptions about growth and yield.

**Response:** DNR appreciates the suggestion to validate the model’s predictions. However, for the RDEIS analysis, DNR used the best data and techniques available at the time. Refer to Comment 49 for more information.

*No.:* 49

*Topic:* Input Data/LiDAR

*Source:* Chris Mendoza, Mendoza Environmental, LLC, page 10

Acquire LiDAR data for all of the OESF to validate forest estate model assumptions regarding current canopy conditions, including the location and amount of northern spotted owl and marbled murrelet habitat in the OESF.

**Response:** DNR has developed a new forest inventory system based on LiDAR and PHODAR data and sample plots. This system, called the “Remote Sensing Forest Resource Inventory System” (RS-FRIS), will replace DNR’s existing inventory system and be used as input data for the tactical model. DNR is investigating ways to use RS-FRIS to better characterize older forest stand conditions. Also, for the tactical model DNR will use an updated forest vegetation simulator (FVS) tree mortality model.

Additional information may be gathered from field sampling as part of other ongoing and planned monitoring projects. For example, the project “Status and Trends Monitoring of Riparian and Aquatic Habitat in the OESF” includes tree sampling in one hundred, 30 by 60 meter plots in riparian forests across the OESF.

*No.:* 50

*Topic:* Input Data Updates

*Source:* Steve Courtney, Interfor, page 2

The success of the forest estate model depends upon accurate forest inventory data. In addition, the determination of northern spotted owl habitat was based on age but has been changed such that’s it now determined by the forest inventory. Though we support this change, we also want to be comfortable with the forest inventory. It is not clear when the forest inventory was last updated nor what DNR’s plan is going forward on how often the inventory will be updated and at what intensity.

**Response:** Forest inventory data is updated periodically through a modeling process to account for time that has passed since it was collected. DNR is currently in the process of developing a new inventory system that is based on sample plots and remote-sensing data (LiDAR and PHODAR).

**No.: 51**

**Topic: Input Data Accuracy**

**Source: Darrell Smith, OFCO, page 79**

The forest estates model input appears badly compromised by inaccurate, out-of-date, or misleading mapping and habitat information. In the small sample of watersheds and sub-watersheds I examined within the OESF (Hoko and Clallam landscapes), I noted what I believe to be more than 20 substantial stream and forest habitat underlying mapping errors on which the forest practices applications were based. I estimated, therefore, that nearly 25 percent of the riparian, stream, and forest habitat I examined was either not properly mapped or mischaracterized. In addition, some slopes appeared to be mismapped and leave areas mischaracterized. There was very heavy windthrow on several upslope and headwater areas resulting from timber harvest activity. The RDEIS environmental analyses rely primarily on output from the forest estates model. Bad model input into good models results in bad model output. Therefore, this RDEIS document is not reliable.

**Response:** Input data and the models on which they are based always can be improved. However, for the RDEIS, DNR used the best data available at the time. DNR will work steadily to improve the accuracy of its input data as the forest land plan is implemented.

## ■ Subject 11: Harvest Levels, Deferrals, and Operable Area

**No.:** 52

**Topic:** Harvest Level Analyzed

**Source:** Miguel Perez Gibson, OFCO, page 51

The harvest level analyzed for both alternatives is higher than the current sustainable harvest calculation of 576 million board feet per decade, and the Landscape Alternative appears to have more disturbance impact as a result of having a higher rate of harvest than existing policy. Given that the current harvest level is the current policy, we question the validity of a model that does not adhere to it. We assert that a planning process that does not adhere to current policy needs to be approved by the Board of Natural Resources (Board). Also, there appears to be an assumption that the next sustainable harvest calculation will be increased. We argue that this is a decision that needs Board approval.

**Response:** DNR respectfully disagrees. To understand why, it is important to understand DNR's planning process.

DNR's planning process has three stages: strategic, tactical, and operational. At the strategic stage, DNR develops policies such as the *Policy for Sustainable Forests*, the HCP, and the sustainable harvest level. Policies define DNR's basic operating philosophy, set standards and objectives, and provide direction upon which subsequent decisions can be based, and are approved and adopted by the Board. At the tactical stage, DNR determines *how* it will implement policies developed at the strategic stage. At this stage, DNR develops forest land plans, procedures, models, maps, and other information. At the operational stage, DNR implements activities such as timber sales in the context of both policies and forest land plans.

Developed at the tactical stage, forest land plans are meant to provide direction, instruction, and guidance for implementing current policy, which includes the sustainable harvest level adopted and approved by the Board. For that reason, forest land plans are **not tied to any specific sustainable harvest level**. Instead, forest land plans provide the guidance managers and foresters need to implement whatever the current sustainable harvest level is in a given decade.

To analyze the potential environmental impacts of the forest land plan, DNR used the analysis model. In developing the analysis model, DNR could have a) constrained the model to meet the current sustainable harvest level, b) constrained the model to meet a hypothetical future harvest level (higher or lower than the current level); or c) allowed the model to find an optimal balance of revenue production and ecological values with no harvest level constraint. Because the harvest level currently is being recalculated, and because it is not possible to know what a future level might be over the decades this plan may remain in effect, DNR selected option c) as the most reasonable approach to analyzing the alternatives.

The harvest level that resulted from this modeling exercise is higher than the current level, but **DNR is not proposing this level for the OESF**. The plan is not tied to any specific level. Nor does DNR change policies, such as the sustainable harvest level, through the forest land planning process.

The sustainable harvest calculation occurs at the **strategic stage** of planning. The outcome of the calculation will be a new sustainable harvest level for all of DNR's sustainable harvest units, including the OESF. For the sustainable harvest calculation, DNR will conduct a separate environmental analysis and public process using a different forest estate model.

**No.:** 53

**Topic:** Harvest Volume Constraints in Forest Estate Model

**Source:** William Fleck, City of Forks, page 5

In reviewing the harvest volume information found within the forest land plan and RDEIS, it appears that the outputs were in fact constrained by the sustainable harvest calculation, even though that is noted as not being the case, or something is not clearly explained. The RDEIS (p. 3-19) indicates that the volume outputs were not constrained. However, on page 80 of the draft OESF forest land plan, the projected volumes in Table A-19 appear to be constrained by the sustainable harvest calculation.

**Response:** DNR did not constrain the analysis model to the current sustainable harvest level for either the RDEIS *or* the draft OESF forest land plan. However, for the draft OESF forest land plan *only*, DNR constrained the model to a funding level of \$2.6 million per year, which approximated the current funding level for the OESF. DNR found that using this funding level resulted in a harvest level that is similar to the current sustainable harvest level. DNR used this funding constraint to provide an estimate of volumes and revenues that may result from the first decade of plan implementation under the Landscape Alternative. Note that future harvest levels and funding levels are likely to change.

**No.:** 54

**Topic:** Impact of Budget on Harvest Volume

**Source:** Tom Partin, AFRC, page 10

The graph showing the impacts of budget on harvest volume shows the \$2.6M/yr., \$1.75M/yr., and \$1.35M/yr. lines trending downward at nearly the same rate (\$2.6 a bit steeper) for the first decade. Yet the \$3.5M/yr. line is relatively flat in comparison. What is the reasoning for this? The other three trend along a similar line, yet the \$3.5 M/yr. line varies over the 100-year planning window.

**Response:** To develop the DEIS, RDEIS, FEIS, and draft OESF forest land plan, DNR used the analysis model. The analysis model developed an optimal solution for producing revenue and meeting its ecological objectives. That optimal solution, expressed as a harvest schedule, was different under each funding level, as funding levels affect when, where, and by what method the model harvested forest stands. A higher funding level may result in more, or different stands being harvested at different

points in time than a lower funding level. Such differences would account for the variations between the lines in Chart A-5.

**No.: 55**

**Topic: Harvest Volumes for State Forest Lands**

**Source: William Fleck, City of Forks, pages 2, 4, and 5**

The City clearly supports adopting the proposed forest land plan over the No Action Alternative. However, we are extremely concerned about the first decadal volumes indicated for the State Forest Lands, formerly referred to as Forest Board Transfer Lands. We believe that the harvest volume numbers in Table A-19 of the draft OESF forest land plan are much lower than historic harvest volumes, and appear to be even lower than the current sustainable harvest calculation's timber sold by DNR's Olympic region during the fiscal year (FY) 2007-2014 period. Table A-19 shows 133.2 MMBF, or 13.3 MMBF annually. This amount is less than the historic offering of the FY07 through FY14 volume sold, which the City estimates as approximately 16.44 MMBF. Further analysis is required as to why this 20 percent additional reduction occurs within the model over both the actual historical sold volume, and the sales offered volume target of 20 MMBF. Please provide further information about this significant impact and how it is reconciled with DNR's *Policy for Sustainable Forest* local economic vitality policy.

**Response:** Being an independent sustainable harvest unit, the OESF is assigned its own sustainable harvest level (DNR 2006a, p.29). This harvest level applies to the OESF as a whole; it is not broken out by trust.

All of the charts and tables in the draft OESF forest land plan, including Table A-19, were based on the outputs of the analysis model. The analysis model was used for environmental analysis; DNR will not use it as a tool for implementation.

The analysis model developed an optimal solution for producing revenue and meeting its ecological objectives, absent a harvest level constraint. The data in Table A-19 represents the timber volumes that would result from implementing that solution in the first decade of plan implementation, given a funding level of approximately \$2.6 million per year. Although the data is broken out by trust, the model does not have any constraint or mechanism to meet volume targets for any individual trust.

Volumes per trust may be higher or lower than historic levels based on numerous, interrelated factors, such as the age of available timber, a landscape's status in meeting northern spotted owl habitat thresholds, and the model's recommendation on when to harvest a stand to produce revenue.

In examining model results from the 2007 sustainable harvest calculation, the State Forest Lands harvest levels in the OESF declines from 20 MMBF per year for the first decade (ended fiscal year 2014) to 10 MMBF in second decade (fiscal year 2015 through 2024). The modeling result displayed in Table A-19 appear to be consistent with this previous analysis and consistent with DNR's policy on local economic vitality.

**No.: 56**

**Topic: Timber Volume Adjustment Factor**

**Source: William Fleck, City of Forks, page 5**

Table A-13 in the draft OESF forest land plan indicates that a potential timber volume adjustment factor was utilized to determine various stand's projected volumes. Is it possible that the adjustment factor may be lower than what has been historically realized in on-the-ground harvest activities? Further, this table does not appear to have a source/citation that provides the basis for this adjustment factor. The City requests further clarification on how these factors were applied in the development of the harvest volumes for the State Forest Lands. Furthermore, the City asks for citations to the literature used to develop these volume adjustment factors.

**Response:** One of the major types of input data in the analysis model is the yield tables. Yield tables provide stand-level projections of forest conditions and how they change over time based on natural growth or harvest activities. DNR developed the yield tables for the analysis model using the Pacific Northwest Coast variant of the USDA Forest Service Forest Vegetation Simulator (FVS-PN) (USDA 20008).

FVS-PN accounts for within-stand competition in a generalized way but does not account for competition from adjacent stands. To account for the latter as well as within-stand variability, DNR adjusted projected volumes in the analysis model using a timber volume adjustment factor. These adjustment factors are based on a stand's edge-to-area ratio. The edge-to-area ratio is the length of the harvest opening compared to its size; complex shapes have higher ratios than simple shapes. The higher the ratio, the larger the adjustment. An adjustment factor of .83 means DNR anticipates the stand to produce 83 percent of the volume projected by FVS-PN. An adjustment factor of .43 means the stand will produce only 43 percent.

Adjustment factors are applied *after* a harvest has taken place in the model. For example, if the model harvests a stand in Decade 3, DNR applies the adjustment factor to estimate the harvest volume that stand will produce when the stand is harvested again in a later decade.

The adjustment factors DNR used in the analysis model were based on the equations and coefficients that Mario Di Lucca developed for the Table Interpolation for Stand Yields (TIPSY) growth and yield program developed by Canada's Ministry of Forests, Lands, and Natural Resources Operations (TIPSY 2007). Refer to Appendix D of the RDEIS, pages 65 through 69, for a more complete explanation.

Differences in today's adjustment factors as compared to what was realized on the ground historically could be attributed to numerous factors, for example the transition from harvesting old-growth forests to harvesting younger stands and the shift from clearcuts to variable retention harvests with more complex opening sizes.

In the draft OESF forest land plan, DNR incorrectly stated that timber volume adjustment factors were applied in FVS-PN. As explained in this response, the adjustment factors were applied in the analysis model itself.

**No.:** 57

**Topic:** Harvest Level

**Source:** Donald Hansen, page 1

What are the results? I've been out in the timber and reprod (regenerated forest stands), I know it is growing very well. I believe that we could be harvesting more.

**Response:** For a brief overview of the results of DNR's environmental analysis, refer to the executive summary of the RDEIS. The sustainable harvest level is calculated and adopted through a separate planning process, not through this forest land planning process.

**No.:** 58

**Topic:** Harvest Level by Trust

**Source:** William Fleck, City of Forks, page 5

In the development of the projected harvest volumes by trust in Table A-19 of the draft OESF forest land plan, were any trust beneficiaries impacted more than others? Please explain how the volume allocation projections by trust were made within the confines of the sustainable harvest calculation or a constrained projection in the draft OESF forest land plan, versus the unconstrained volume projection found in the RDEIS on page 3-19.

**Response:** The OESF is an independent sustainable harvest unit that is assigned its own sustainable harvest level. That level applies to the OESF as a whole; it is not broken out by trust. The volumes shown in Table A-19 reflect the analysis model's optimal solution for producing revenue and meeting its ecological objectives, given a funding level of approximately \$2.6 million per year. Although the results are shown by trust, the analysis model did not have any constraint or mechanism to meet volume targets for any individual trust. Refer to Comment 55 for more information.

**No.:** 59

**Topic:** Fiduciary Responsibility and Reasons for Harvest Deferrals

**Source:** Tom Partin, AFRC, page 5 and 10; William Fleck, City of Forks, page 4; John Gold, Sierra Pacific, page 1; NOTAC, page 1

Both the draft OESF forest land plan and RDEIS denote that 107,320 acres are deferred from management within the OESF (later the number of deferred acres is given as 110,832). These deferrals represent 43 percent of the land base. The total area restricted from timber harvest appears to go well beyond HCP requirements. Also, the number of acres deferred is substantially higher than the estimated 68,492 acres identified as being deferred for both short and long-term periods in the OESF per the "Managed Forest Lands in the Olympic Region" 2007 map produced by DNR's land management division.

These deferrals result in an assumed sustainable harvest level that is much lower than the biological capacity of the OESF. The RDEIS appears to project that on average, over 100 years of management, the OESF will produce roughly 85 million board feet per year of harvestable volume. That comes to about 330 board feet per acre per year, which is substantially below the expected production from commercial forest lands on the western Olympic Peninsula.

Comparable private properties managed for long-term growth of forest products typically achieve conservation of non-timber resources and compliance with State and federal regulatory requirements with only 15 to 25 percent of the landscape in long-term deferral.

Although the goal of integrating conservation with commercial forest production can be expected to involve some tradeoffs, we have concerns that by taking 43 percent of state trust lands in the OESF off base, without managing much of it for either conservation or commodity production, the forest land plan has violated the trust principles that are the foundation of DNR’s management of state trust lands. We question whether current Board of Natural Resources policies and objectives used to develop this plan fulfill DNR’s fiduciary trust responsibility.

Please explain why the number of deferred acres has increased over time. Also, the reason why management of these acres is deferred should be explicitly itemized in the FEIS. Please break down by acres or percentage the various types of long-term deferrals. Please provide a separate appendix that identifies the stand polygon that has been deferred, the reason(s) for the deferral, and the trust impacted by that deferral.

**Response:** The DEIS, RDEIS, FEIS, and draft OESF forest land plan were developed with the analysis model. In the analysis model, DNR categorized all DNR-managed lands in the OESF as “operable,” “deferred,” or “partially deferred.”

- Operable areas were available to the model for both thinning and variable retention harvest.
- Partially deferred areas were available to the model for thinning only.
- Deferred areas were not available to the model for thinning or variable retention harvest.

This categorization was necessary to produce a harvest schedule representative of each alternative as well as all current policies and management practices.

Areas deferred in the analysis model (not available to the model for thinning or variable retention harvest) included the following:

- Old growth forests and other areas deferred by current DNR policies.
- Permanent deferrals, which include natural resources conservation areas and natural area preserves.
- Other areas as needed to represent current management practice and guidance:
  - Potentially unstable slopes or landforms, which were identified using a slope stability model. DNR has guidance from both the forest practices rules and the HCP on preventing an increase in the frequency and severity of landslides.
  - Northern spotted owl habitat. Northern spotted owl habitat will be managed in the OESF per the northern spotted owl conservation strategy, which involves restoring and maintaining threshold proportions of habitat in each of the 11

landscapes of the OESF. DNR deferred existing habitat in the model on a short- or long-term basis to represent this strategy in the model.

- Other areas as necessary to represent the HCP conservation strategies in the model.
- Forest stands that are inoperable or of such low commercial value that the cost of harvest would exceed potential revenue.

The total number of acres deferred in the analysis model was 110,832 acres. The second figure cited (107,320 acres) includes all deferred areas except the permanent deferrals (3,512 acres).

The table below lists the areas deferred in the analysis model and their respective acres. **There is a high degree of overlap between the deferrals on this list.** For example, many old-growth forests are also northern spotted owl or marbled murrelet habitat, and some old-growth forests may be located on potentially unstable slopes. Therefore the numbers in this table do not add up to 110,832 acres.

<b>Deferral</b>	<b>Acres</b>
Marbled murrelet occupied sites	58,118
Potentially unstable slopes and landforms	49,233
Old-growth forest	43,419
Mapped Old Forest Habitat	39,674
Young Forest Habitat	18,518
Wetlands and their associated wetland management zones	8,822
Natural areas preserves/natural resource conservation areas	3,512
Research plots	2,259
Low-site stands with no commercial value	1,916
Problem or inoperable stands	726
Upland Wildlife Management Areas	699
Unknown northern spotted owl habitat (at least 50 years old)	665
Seral stage blocks (Old growth research areas)	612
Gene pool reserves	458
Old Forest Habitat (Type A, Type B, and high quality nesting)	373
Protected from harvest (general category)	197
Recreation sites	40
Administrative sites	11

The number of acres reported as deferred in the OESF has increased over the past eight years for many reasons:

- Increased sophistication of DNR’s GIS technology, which results in improved mapping and reporting

- Improved ability to report and map local knowledge, such as haul road access and economic feasibility
- Changes in techniques for calculating and reporting deferred acreage totals
- 2006 Settlement Agreement
- Marbled murrelet policy development and interim guidance
- Land transfers

Deferrals in the OESF are consistent with the HCP as well as all other DNR policies and state and federal laws.

**No.:** 60

**Topic:** Length of Harvest Deferrals

**Source:** Carol Johnson, NOTAC, pages 1 and 2; William Fleck, City of Forks, page 4

Peninsula Cities and Clallam County are struggling with the financial burden of regulations being passed down to already depressed budgets. Clallam County and the City of Port Angeles are being crushed by numerous state and federal environmental clean-up mandates. The Port Angeles School District needs an estimated 70 million dollars to replace schools that are far beyond their life expectancy. How much revenue is being lost on the deferred acres that the school construction fund would have to help fund more school construction? The reality is that 57 percent of the land base that is available for harvest will be significantly reduced by harvest regulations, and that is why it is important for everyone to understand the real cost of ecological protections. We need more certain revenues from state trust lands and we do not see how either of the two alternatives gets us there.

Since deferred acres are being held in reserve until younger areas grow into desired habitat, it should be possible to estimate when this will occur and schedule the harvest of these deferred acres accordingly. We need to understand when these deferred acres will become revenue to the trusts. These identified deferred acres should be cataloged in such a way as to allow DNR's land management division or Olympic region to assess whether the deferral is still valid and/or warranted. In addition, the forest land plan should have a specific policy objective that articulates the manner in which all deferred lands are reviewed to determine whether the deferral remains justified.

**Response:** Areas in the OESF may be deferred for many reasons. Refer to Comment 59 for more information.

How long it takes a landscape to achieve northern spotted owl habitat thresholds depends largely on the landscape's current condition. Some landscapes may take longer to achieve thresholds than others due natural disturbance or intensive past harvest that was carried out under different objectives and policies. In the draft OESF forest land plan (Appendix A to the RDEIS), DNR provided the projected decade in which each landscape is expected to reach thresholds under the Landscape Alternative (Table A-11 on p. 44). This data was based on analysis model outputs.

**No.:** 61

**Topic:** **Compensating Trusts for Harvest Deferrals**

**Source:** **William Fleck, City of Forks, page 4; Carol Johnson, NOTAC, page 2**

Some people expect the long-term deferrals to extend in time beyond the current generation of beneficiaries. As such, a policy needs to be explored that brings a level of compensation to the present generation of trust beneficiaries associated with the deferral of those acres. If the Board of Natural Resources placed a higher ecological value over revenue production for this plan, then we need to know when or if the foregone revenue will ever be recovered.

**Response:** DNR manages state trust lands to produce revenue for trust beneficiaries while also meeting its ecological objectives per the HCP and *Policy for Sustainable Forests*, as well as applicable state and federal laws. DNR’s responsibility as a trust lands manager is to act with undivided loyalty to the trust beneficiaries to the exclusion of all other interests and to manage trust assets prudently (DNR 2006a, p. 15). Setting or exploring new policies is outside of the scope of this forest land planning process.

**No.:** 62

**Topic:** **Harvest Deferrals and Unzoned Forest**

**Source:** **Tom Partin, AFRC, page 3**

We do not understand how taking 110,832 acres (43 percent) of the OESF off base for the next 100 years is different from creating a “zoned forest” and thus violating the first principle of the OESF—that it be managed as an unzoned forest.

**Response:** There have always been harvest deferrals in the OESF, starting with 15,000 acres of old-growth forest deferred for 15 years when the OESF was founded.

The OESF is being managed under an “integrated management” approach. Integrated management includes the use of silviculture to achieve integration of revenue production and ecological values at a stand and landscape level, through practices such as variable density thinning. It includes tailoring riparian buffers to watershed conditions. It includes the “unzoned” approach to northern spotted owl habitat conservation, in which northern spotted owl habitat can be located anywhere within a landscape and can move over time as long as threshold proportions of habitat are maintained. And it involves a research and monitoring program, with a step-by-step process of adaptive management, to learn from all of the above and use that knowledge to improve future management. All of these elements are in place in the OESF.

DNR uses deferrals to help meet its ecological objectives per the conservation strategies. For example, many old-growth stands are also Old Forest Habitat that contributes toward northern spotted owl habitat thresholds. And because deferrals are not co-located in a single contiguous block but interspersed with more actively managed areas, they help DNR realize an important component of integrated management: a working forest with a full-range of forest conditions (DNR 1997 p. IV.81). For more information on deferrals, refer to Comment 59.

**No.:** 63

**Topic:** Actual Size of Operable Area

**Source:** Tom Partin, AFRC, page 4

By the time the draft OESF forest land plan takes 43 percent of the OESF off base, then complies with the HCP requirements for riparian areas (which must be managed on a basis that does not generate significant revenue for the trust beneficiaries, and which contribute toward the 20/40 habitat objective), and meets the 20/40 habitat objective, only 73,269 acres (28 percent) of the OESF is available for what a private land manager would consider commercial management. The assumption of the HCP was that roughly 60 percent of the OESF could be devoted to commercial production using something approaching normal commercial practices under the forest practices rules.

**Response:** The HCP states that DNR would restore and maintain 40 percent of each landscape as northern spotted owl habitat. However, the HCP did not anticipate that the remaining 60 percent of each landscape would be fully operable.

For 60 percent of the land base to be fully operable, the 40 percent of each landscape that is being managed as northern spotted owl habitat would need to align perfectly with all other areas that are deferred from harvest or managed under one of the other conservation strategies. This overlap was not expected to occur. DNR’s 1997 projections showed that more than half of northern spotted owl habitat would be located in riparian areas (DNR 1997, p. IV.106), but the remainder would develop outside of these areas. As a result, in some landscapes less than 60 percent of the acres would be fully operable.

**No.:** 64

**Topic:** Operable Acres with No Harvest Scheduled Versus Long-Term Deferral

**Source:** Tom Partin, AFRC, page 9; John Gold, Sierra Pacific, page 2

Page 71 of the draft OESF forest land plan states that 26,289 acres (18 percent) of the operable area has no harvest activities scheduled. These acres represent 10 percent of the OSEF and seem to be in addition to long-term deferrals. It is not clear how a "no management" prescription for these acres will support commodity production or foster habitat development. DNR should explain how “an expectation that the best pathway to meet conservation objectives is ‘no management’” is different from a long-term deferral, and how a long-term deferral is different from not assigning harvest activities to these acres.

**Response:** Operable areas not scheduled for harvest are still operable and available for harvest (stand replacement or thinning) to produce revenue for trust beneficiaries. By contrast, areas deferred per current DNR policies cannot be harvested as long as the policy that deferred them remains in place.

The primary reason that the analysis model did not recommend most of these 26,289 operable acres for harvest is the funding level. For the estimates on page 71 of the draft OESF forest land plan, DNR used a funding level of \$2.6 million per year, which is the current approximate funding level for the OESF, to provide an estimate of harvest volumes and revenue for the first decade of plan implementation. The analysis model did not select these acres of operable land for harvest because it was constrained by a

lack of financial resources; the model simply selected the optimal set of stands for harvest from the available resources of land and capital. Given a higher harvest level, many of these acres may be recommended for harvest but some would not because the cost of harvesting them would be too high. Some of these 26,289 acres were not selected for harvest because they contribute to other objectives.

The analysis model (and its harvest schedule) will not be used as a tool for plan implementation; refer to Comment 46 for more information.

**No.:** 65

**Topic:** Operable Acres with No Harvest Scheduled

**Source:** Tom Partin, AFRC, pages 4, 6 and 9; Steve Courtney, Interfor, page 2; John Gold, Sierra Pacific, page 2

The model should be adjusted to ensure that all operable acres, including the 26,289 acres with no harvest scheduled, that are not required to meet the riparian strategy, or whatever portion of the 20/40 habitat objective cannot be met by the riparian strategy, are managed for commercial production with the maximum sustained yield. If these acres have negative net present values, the model would show these effects accordingly.

If DNR does not schedule these acres, DNR should explain why the forest estate model calls for over 26,000 operable acres to receive no harvest of any kind during the next 100 years. In our meeting with DNR staff, they had no explanation for this. We believe that if the forest estate model manages only 57 percent of the land in the OESF for commercial forestry, it is incumbent on DNR to understand and explain what causes the forest estate model to leave so much operable land underutilized.

The forest land plan should provide a breakdown of the acres within this category by the various reasons described in the paragraph on page 71 of the draft OESF forest land plan. Also, the reasons or modeling constraints should be clearly identified and explained in the FEIS and forest land plan and any unintended modeling constraints should be corrected in the FEIS. Clearly there must be some limiting factor: budget constraints, net present value, or something; such answers should be provided before any final product is produced. DNR also should indicate if it did a sensitivity analysis to determine any cause for the unscheduled acres. Finally, DNR should explicitly indicate that these no management acres are not a hard target, but rather a best estimate given current model assumptions, and that they are subject to decrease in the future.

**Response:** The primary reason the analysis model did not recommend harvest on 26,289 operable acres was the funding level. Refer to Comment 64 for more information.

**No.:** 66

**Topic:** Habitat Thresholds

**Source:** Tom Partin, AFRC, page 9

With 43 percent of the land base in long-term deferrals, why does it take so long to reach the 20/40 habitat objective in many of the landscapes? Our assumption is that most of the long-term deferrals are due to issues other than habitat, and therefore may be located in younger age classes.

**Response:** How long it takes a landscape to reach the 20/40 northern spotted owl habitat threshold is largely dependent on the landscape’s current condition, which is the result of both natural disturbance and past harvest. Some landscapes will take longer to reach thresholds because of intensive past harvest conducted under different policies and objectives.

In terms of number of acres, the most significant deferrals in the analysis model are northern spotted owl and marbled murrelet habitat and old-growth forests. The majority of these deferrals consist of older, mature forest. Another large category is potentially unstable slopes and landforms, many of which are in younger age classes. For more information on deferrals, refer to Comments 59.

**No.:** 67

**Topic:** Deferred and Operable Acres in Riparian Areas

**Source:** Tom Partin, AFRC, page 9 and 10

How many deferrals are related to or located in riparian areas? Do the operable acres include acreage within riparian areas that can be managed according to various DNR policies and procedures?

**Response:** Unless they are deferred for other reasons (such as old-growth forests), riparian areas are considered operable. However, riparian areas are managed primarily for ecological values. A limited number of forest management activities are allowed in riparian areas, and the activities allowed differ by alternative. For more information, refer to pages 2-16 through 2-21 of the RDEIS.

**No.:** 68

**Topic:** Operable Areas Assigned to Thinning Only

**Source:** Tom Partin, AFRC, pages 4, 5, and 9

The draft OESF forest land plan shows that under the forest estate model, some 26,230 operable acres are not scheduled for harvest of any kind over the 100-year horizon of the plan, and another 23,365 operable acres are scheduled for thinning only. Thus under the forest estate model, another 19 percent of the land base is not to be managed on any commercial basis. We assume, but DNR could not confirm, that the thinning only acres are heavily in the riparian areas. Please explain how stands were assigned to the thinning-only regime, describe or show where they are spatially located on the landscape, and indicate whether they are in riparian areas or associated uplands. If associated with the uplands, what is the reasoning behind assigning them to a thinning-only regime?

**Response:** DNR categorized some stands as thinning only (“partially deferred”) before the analysis model was run. The analysis model assigned other stands to a thinning-only regime as part of its optimal solution.

Regarding the former, DNR designated approximately 11,000 acres to thinning only regimes for ecological reasons. Most (78 percent) of these acres are located in the uplands and the remainder are located in riparian areas. Examples of areas assigned to

thinning only regimes include wetlands, channel migration zones, and certain types of northern spotted owl habitat.

Regarding the latter, the analysis model assigns forest stands to different silvicultural regimes to produce revenue and meet its ecological objectives. The model also must maintain intergenerational equity per the *Policy for Sustainable Forests*. Specifically, the model must maintain the harvest volume for each decade within 25 percent (plus or minus) of the preceding decade. The model may assign a stand to a thinning-only regime to keep harvest levels within these bounds. Refer to Comment 64 for more information on operable acres not scheduled for harvest.

**No.: 69**

**Topic: Rotation Lengths**

**Source: Tom Partin, AFRC, page 9**

Please explain how stands are assigned to the various rotation ages (40, 50, 60, 70, and 80+) and describe or show where they are spatially located on the landscape.

**Response:** The analysis model develops an optimal solution of when, where, and by what method to harvest forest stands to produce revenue and meet its ecological objectives. This optimal solution is expressed as a harvest schedule. For the forest land plan, DNR examined the harvest schedule and summarized the percentage of the land base assigned to different rotation ages (Table A-17) in the analysis model. Rotation ages are an output of the model and are not a function of geographic location.

**No.: 70**

**Topic: Rotation Lengths**

**Source: John Gold, Sierra Pacific, page 2**

Projected rotation lengths vary from 40 to 80 years, with 23,365 acres (nearly 20 percent of the identified operable acres) projected for thinning only. The weighted average rotation length exceeds 60 years (Table A-17). The proportion of large-diameter logs increases proportionate to increased rotation age. The RDEIS relies on average stumpage values and average harvest costs only. However, trends in domestic log demand discount very large diameter logs. Modern mills in the OESF operating area are optimized for logs typical of rotation ages less than 50 years. The RDEIS financial analysis obscures these factors and erroneously assumes equal revenue per unit volume regardless of rotation age. The FEIS should analyze this effect and the forest land plan should match market signals.

**Response:** DNR considered adjusting stumpage values in the analysis model based on product classes such as log diameter. However, DNR conducted a review of 10 years of timber sale bids and did not find information to support this adjustment. Log prices are affected by numerous factors, such as season, harvest and road building costs, and sale type. Also, the Washington State Department of Revenue prices logs by species but not by diameter ([http://dor.wa.gov/Content/FindTaxesAndRates/OtherTaxes/Timber/forst\\_stump10.aspx](http://dor.wa.gov/Content/FindTaxesAndRates/OtherTaxes/Timber/forst_stump10.aspx)). Finally, the majority of DNR's timber sales in the Olympic region are lump sum sales. Per DNR's policy on financial diversification, DNR "will identify and

offer a mix of forest products to take advantage of existing markets and market value fluctuations.”

**No.:** 71

**Topic:** Arrearage and Impact Levels

**Source:** William Fleck, City of Forks, page 5

While the current decadal (2004-2014) sustainable harvest calculation for the OESF is 576 MMBF, it appears from the information the City has available to it that this number has not been reached or obtained due to staffing levels and other legitimate challenges. While the draft OESF forest land plan and its RDEIS do not address this arrearage, a question exists as to what occurs if DNR performs additional harvest activities to meet its statutory obligation regarding this unoffered volume. See RCW 79.10.330. The RDEIS denotes that impacts are determined by the number of forest stand entries that occur within a landscape. However, if additional entries are required to meet future sustainable harvest calculation statutory obligations with the sale of any existing arrearage, do those entries change the impacts noted on Table 3-15? The City recommends that DNR include some discussion of potential additional stand entries arising from addressing potential arrearage issues in the first decade of the forest land plan, which would be the next decadal sustainable calculation period.

**Response:** An analysis of arrearage options and associated environmental impacts is beyond the scope of this forest land plan.

## ■ Subject 12: Marbled Murrelet

*No.:* 72

**Topic:** Basing Marbled Murrelet Interim Strategy on 2008 Science Team Report

**Source:** Connie Gallant, page 1; William Spring, page 1; Brian Windrope and Chris Karrenberg, Seattle Audubon, page 1; Monica Fletcher, Sierra Club, page 2; OFCO (summary), page iv; David Mann, OFCO, page 4; Kara Whittaker, PhD., pages 125 and 126

Protections for marbled murrelet habitat are barely referred to in the RDEIS, and this constitutes a serious omission. The draft must be further revised to fully incorporate the 2008 Science Team Report's recommendations for all landscapes in the OESF. These recommendations should include mandatory retention of all areas of murrelet habitat now in deferred status, as well as habitat buffering and disturbance avoidance. These vitally important measures must not be optional, as proposed by DNR.

In the OESF RDEIS, DNR is using guidance from a 3/7/2013 internal memo titled “Memorandum for Marbled Murrelet Management within the Olympic Experimental State Forest” (Marbled Murrelet OESF Memo). The Marbled Murrelet OESF Memo is inconsistent with the 2008 Science Team Report because it treats all landscapes exactly the same despite wide variability in their ability to support and grow the marbled murrelet population; makes occupied site buffers and timing restrictions from adjacent management activities optional, meaning they may not exist at all in places; makes no effort to block up or restore habitat in marbled murrelet management areas despite the clear conservation benefits of doing so; and does not call for any new protocol surveys despite documented inadequacies with former survey efforts (though this is mitigated for by deferring all occupied marbled murrelet sites, reclassified habitat, Old Forest and science team additional habitat, regardless of survey status).

These inconsistencies may have dire consequences for the marbled murrelet population of the OESF because the Marbled Murrelet OESF Memo fails to help meet the recovery objectives of the HCP and contribute to a stable or increasing population, an increasing geographic distribution, and a population that is resilient to disturbance. It also precludes conservation options for the marbled murrelet LTCS. The Marbled Murrelet OESF Memo could be implemented for another two years or more, further degrading marbled murrelet habitat conditions that will take many decades to restore. This degradation is illustrated by DNR’s recent proposals for the Rainbow Rock Timber Sale (Sale No. 90248) and Goodmint Timber Sale (Sale No. 90599), both of which will result in significant adverse impacts on marbled murrelets and DNR’s ability to protect and recover this species. The failure to consider an interim policy that is more, not less protective than the status quo “no action” alternative is a fatal defect.

In order to contribute to the recovery of the marbled murrelet, it is critical and imperative that the Marbled Murrelet OESF Memo and forest land plan be amended to fully reflect the 2008 Science Team Report for marbled murrelet to make a significant contribution to maintaining and protecting the population—or, at a minimum:

- Require 328 foot (100 meter) buffers around all occupied sites and Old Forest,
- Require timing restrictions from adjacent management activities in a 0.25 mile radius around all occupied sites during the breeding season (1 April – 15 September),
- Designate marbled murrelet management areas as defined by the Science Team and begin to restore habitat within them, and
- Provide opportunities adjacent to marbled murrelet management areas to mitigate for harvest in those areas since the completion of the 2008 Science Team Report.

**Response:** The Marbled Murrelet OESF Memo provides DNR with guidance for implementing the existing HCP marbled murrelet conservation strategy, which is current DNR policy. Changes to DNR policies are outside the scope of this project. DNR currently is developing the marbled murrelet LTCS, which will replace the current HCP strategy, in a separate planning process.

**No.:** 73

**Topic:** Forest Land Plan Premature Without the Marbled Murrelet LTCS

**Source:** David Mann, OFCO, pages 2 and 3; OFCO (summary), page iv

The RDEIS and proposed forest land plan are premature until DNR has completed and implemented its marbled murrelet LTCS. The HCP required prompt study, inventory survey, and development of the long-term strategy “consecutively” and without delay. By failing to promptly complete and adopt the marbled murrelet LTCS and incorporate its requirements into the proposed forest land plan and RDEIS, the RDEIS remains incomplete and fails to present a true alternative that is consistent with the HCP.

The RDEIS erroneously defers analysis of the proposed forest land plan’s impacts on marbled murrelets to an unknown later date. Indeed, rather than address the impacts on marbled murrelets, the RDEIS brushes off concerns by simply asserting that final adoption of the marbled murrelet LTCS may lead to an amendment of the forest land plan. There is no excuse for failing to complete the marbled murrelet LTCS, incorporate its requirements into the proposed forest land plan, and evaluate the impacts of the forest land plan on marbled murrelets through the EIS process.

As explained in the RDEIS, the forest land plan falls into the “tactical” stage of DNR’s planning process. It is not appropriate to move forward into the tactical stage of planning until the “strategic” phase is complete. As the RDEIS explains, “[p]olicies define DNR’s basic operating philosophy, set standards and objectives, and provide direction upon which subsequent decisions can be based.” Because DNR has not completed work on its marbled murrelet LTCS, nor received approval from the federal agencies to implement the marbled murrelet LTCS, DNR had not completed its strategic efforts. It remains premature to move forward with implementation.

The RDEIS should be withdrawn, and once DNR has adopted the marbled murrelet LTCS, the RDEIS should be reissued with an alternative that complies fully with the HCP, the marbled murrelet LTCS, and all federal and state laws and trust duties.

**Response:** Section B.4 of the 2006 Settlement Agreement states that “The Department will proceed with forest land planning for the OESF Planning Unit, second in line behind the South Puget Planning Unit.” DNR began preparing the DEIS for the OESF forest land plan immediately upon completion of the forest land plan for the South Puget HCP Planning Unit. Once the marbled murrelet LTCS has been completed and approved, DNR will amend the OESF forest land plan if and as necessary.

*No.:* 74

**Topic:** **Foreclosing Options for the Marbled Murrelet LTCS**

**Source:** **Brian Windrope and Chris Karrenberg, Seattle Audubon, page 2**

The forest land plan forecloses conservation options. In a 6/7/2011 letter from USFWS’ Ken Berg to DNR’s Commissioner Peter Goldmark, Mr. Berg states the following: “While we do not consider that the marbled murrelet management areas proposed in the Report are the only possible approach for an acceptable long-term strategy, it is very important that DNR not preclude this conservation option while the long-term strategy is completed. Similarly, DNR should not foreclose the option of achieving long-term murrelet conservation in the OESF by applying the [Science Team] Report’s recommendations for the landscape planning units.” DNR has yet to complete the marbled murrelet LTCS. Accordingly, the OESF Plan should not foreclose conservation options and is premature until DNR has completed its marbled murrelet LTCS.

**Response:** Refer to Comment 73.

*No.:* 75

**Topic:** **Forest Land Plan Premature Without Marbled Murrelet LTCS**

**Source:** **Coleman Byrnes, page 1**

The marbled murrelet is listed under the Endangered Species Act. This is no secret. DNR knows this. It is outrageous that DNR does not have a marbled murrelet recovery plan in place. It is also outrageous that DNR refuses to set a deadline for such a plan. How can this plan be implemented without a murrelet recovery plan?

**Response:** Development and implementation of a recovery plan for a listed species, including the marbled murrelet, is the responsibility of USFWS. DNR’s obligation under the HCP is to develop a long-term conservation strategy for marbled murrelet habitat on state trust lands. This strategy is currently in development; until it is completed and approved, DNR will continue managing state trust lands in the OESF under the current HCP marbled murrelet conservation strategy, using the guidance provided in the Marbled Murrelet OESF memo (refer to Appendix F of the RDEIS).

*No.:* 76

**Topic:** **Evaluating Alternatives Without the Marbled Murrelet LTCS**

**Source:** **Carol Johnson, NOTAC, page 1**

Without knowing specifically what the OESF allowable cut will be and without knowing the effect on the allowable cut of the to-be-developed marbled murrelet LTCS, we cannot determine which alternative is best for the beneficiaries. We recognize that these are Board of Natural

Resources policy issues but they have significant effects on the forest land plan and on revenue to trust beneficiaries. They need to be addressed before the final plan is adopted.

**Response:** Long-term revenue for trust beneficiaries is dependent on the sustainable harvest level, which is determined each decade through a separate planning process. The sustainable harvest level will be the same under any alternative chosen for the OESF. For more information, refer to Comment 52.

The marbled murrelet LTCS is being developed through a separate planning process. Once the strategy has been completed and approved, DNR will update the forest land plan if and as necessary.

**No.:** 77

**Topic:** Habitat Configuration Resulting From Integrated Management

**Source:** Kara Whittaker, PhD., OFCO, pages 126 and 127

The landscape patterns that result from the experimental “integrated management” approach of the OESF are likely to perpetuate the decline of the marbled murrelet. DNR describes: “What makes the integrated management approach unique is that deferrals, riparian management zones, and other areas that primarily support ecological values are *interspersed* with more actively managed areas, *not consolidated in large blocks*” (RDEIS, p. 72, emphasis added). This is the opposite of the habitat configuration needed to ameliorate high marbled murrelet nest predation rates and low juvenile recruitment. A long-term shifting mosaic model consistent with integrated management may not allow for successful maintenance and dispersal of species with high site fidelity like marbled murrelets and northern spotted owls until their populations are much closer to recovery.

**Response:** The integrated management approach is based on the requirements of the HCP, which is current DNR policy. Changes to DNR policies are outside the scope of this analysis.

DNR’s wildlife analysis in the RDEIS found that the number of acres of interior older forest on state trust lands in the OESF is project to increase by 12,000 to 14,000 acres under the No Action and Landscape alternatives (refer to Chart 3-74 on p. 3-195 of the RDEIS). Also, DNR’s analysis of patch size indicated that, over time, the number of acres of interior older forest in the largest patch category (over 1,000 acres) is expected to increase from 10,000 to 17,000 acres under the No Action and Landscape alternatives (refer to pages 3-194 through 3-199).

**No.:** 78

**Topic:** Changes to Other Conservation Strategies

**Source:** Kara Whittaker, PhD., OFCO, page 124

It is important to note that “The Science Team assumes that the areas protected under the other conservation strategies will remain protected throughout the life of the HCP. The Science Team recommends that, if other conservation strategies change such that they discontinue benefits to the marbled murrelet, policy be updated to maintain protection of areas important to the marbled murrelet” (Raphael et al. 2008, p. 3-34). In other words, if commitments for the northern spotted

owl and riparian conservation on DNR-managed lands are weakened in the forest land plan, they must not compromise the integrity of important marbled murrelet habitat areas.

**Response:** DNR is not proposing any changes to either the northern spotted owl or riparian conservation strategies as part of this planning process. The purpose of forest land planning is to implement, not change, DNR policies.

Until the marbled murrelet LTCS has been completed and approved, DNR will continue managing state trust lands in the OESF under the current HCP marbled murrelet conservation strategy, using the guidance provided in the Marbled Murrelet OESF memo (refer to Appendix P of the RDEIS).

**No.:** 79

**Topic:** Habitat Loss

**Source:** Connie Gallant, page 1

I have been very concerned with DNR's proposals to continue logging in habitat sensitive areas, particularly marbled murrelet habitat. In a single decade (1996-2006), roughly 243,500 acres (30 percent) of higher suitability nesting habitat was lost on non-federal lands in Washington State (including the OESF), and 94 percent of this loss was due to timber harvest (Raphael et al. 2011).

**Response:** The figure cited includes private as well as state trust lands. DNR manages state trust lands in the OESF under the current HCP marbled murrelet conservation strategy, using the guidance provided in the Marbled Murrelet OESF memo (refer to Appendix F of the RDEIS). Under this strategy, DNR defers from harvest all occupied marbled murrelet sites as well as “old forest,” “reclassified,” and “science team additional” habitat. Per DNR policy, old-growth forests also are deferred from harvest.

**No.:** 80

**Topic:** Basing Marbled Murrelet LTCS on 2008 Science Team Report

**Source:** Kara Whittaker, PhD., OFCO, pages 119 and 124

The 2008 Science Team Report should serve as the foundation for the marbled murrelet LTCS and the forest land plan because it was designed precisely to help meet the recovery objectives of the HCP. The 2008 Science Team Report describes in detail how to manage marbled murrelet nesting habitat to contribute to a stable or increasing population, an increasing geographic distribution, and a population that is resilient to disturbance.

Significant progress toward these three biological goals can be made if the detailed management recommendations of the Science Team are followed. In the OESF specifically, the management strategies recommended by the Science Team are expected to result in a 28 percent increase in population size (as measured by habitat capability), a more stable population due to increased interior habitat, improved ecological distribution, and improved resilience.

A collection of conservation groups has crafted a conservation alternative for the marbled murrelet LTCS that builds upon the 2008 Science Team Report and is consistent with DNR's trust obligations and the need, purpose, and objectives of the marbled murrelet LTCS (“Alternative 4,”

Attachment 1). Alternative 4 makes the following recommendations in addition to those outlined in the 2008 Science Team Report:

- Complete new protocol surveys (Evans Mack et al. 2003) of any reclassified or other high quality habitat prior to it being released for harvest to ensure it is in fact unoccupied by murrelets.
- Limit disturbance in a 0.25 mile radius around occupied sites during the breeding season. Breeding season timing is defined in the most up-to-date Pacific Seabird Group survey protocol as 1 April – 15 September.
- Re-delineate marbled murrelet management areas as needed to account for harvest since the completion of the 2008 Science Team Report, using habitat suitability model output (Raphael et al. 2011) to incorporate existing habitat, stands that are close to habitat condition, or simply structured mature forest that can act as a buffer.

The conservation groups requested that DNR and USFWS first evaluate the proposed conservation alternative in the DEIS for the marbled murrelet LTCS and then ultimately adopt it as the LTCS for the marbled murrelet.

**Response:** The marbled murrelet LTCS is being developed in a separate planning process and is outside the scope of this OESF forest land planning process. Once the LTCS has been approved, DNR will amend its forest land plan if and as necessary.

**No.: 81**

**Topic: Current Interim Strategy as Regulatory Ceiling**

**Source: William Fleck, City of Forks, page 6**

The City understands that DNR is undertaking a long-term strategy for the marbled murrelet as required by the HCP. Currently, DNR is utilizing the existing interim marbled murrelet strategy with some minor modifications in the establishment of buffers around the polygons associated with potential murrelet habitat. The City understands that the interim strategy was developed to provide the greatest level of flexibility for future policies to address murrelet populations on DNR-managed lands. The City wants to state that the existing interim strategy, regarding the need to aid in the stabilization of murrelet populations, must be seen by DNR as a regulatory ceiling under which the marbled murrelet LTCS would fall, rather than a regulatory floor, or starting point for additional regulatory actions that could result in further deferrals of the existing manageable land base within the OESF.

**Response:** The marbled murrelet LTCS is being developed in a separate planning process and is outside the scope of this OESF forest land planning process.

**No.: 82**

**Topic: Development of Marbled Murrelet LTCS**

**Source: Grayson Holmes, CRANE, pages 1 through 27**

CRANE re-submitted comments in response to DNR's request for comments on the scope of an EIS for the development of the marbled murrelet LTCS.

**Response:** The comments submitted were a duplicate of the comments submitted previously for scoping of the marbled murrelet LTCS. Development of the LTCS is outside the scope of this forest land planning process.

**No.:** 83

**Topic:** Development of Marbled Murrelet LTCS

**Source:** Derek Poon, OFCO, pages 59 and 60

The nature and context of DNR-managed lands in the OESF, as well as the OESF mission, suggest an “unzoned” approach to achieving biological goals for marbled murrelet conservation. The unzoned management approach was used as a guiding principal when the Science Team developed OESF conservation objectives. An effective unzoned approach to marbled murrelet conservation should consider the biological goals of a stable or increasing population size, increasing geographic distribution, and increased resilience to disturbances, in the context of other OESF objectives, and the OESF’s patterns of land cover, ownership, and forest zones.

**Response:** The marbled murrelet LTCS is being developed in a separate planning process and is outside the scope of this OESF forest land planning process.

**No.:** 84

**Topic:** Review and Comment on Marbled Murrelet LTCS

**Source:** Gary Bell, WDFW, page 5

It is our understanding that the marbled murrelet LTCS for DNR-managed lands, currently being developed with USFWS, will be additive and incorporated into the basic ground-work initiated by this forest land plan. We respectfully request that any changes in DNR procedures or amendments concerning the integration of the marbled murrelet LTCS be forwarded to WDFW and stakeholders for a review and comment period. It is our understanding that until the final marbled murrelet LTCS is official, the current procedure (“Memorandum for Marbled Murrelet Management within the Olympic Experimental State Forest”) outlined in Appendix F of the RDEIS will remain in place.

**Response:** DNR manages state trust lands in the OESF under the current HCP marbled murrelet conservation strategy, using the guidance provided in the Marbled Murrelet OESF memo (refer to Appendix F of the RDEIS). The current HCP strategy will remain in effect until the marbled murrelet LTCS is approved. All of our stakeholders, including WDFW, will be given opportunities for review and comment during the LTCS environmental analysis process.

**No.:** 85

**Topic:** Balancing Fiduciary Duties and HCP Responsibilities

**Source:** Monica Fletcher, Sierra Club, page 3

The Sierra Club recommends that DNR acknowledge the impacts past forest practices have had on the decline of the marbled murrelet and take the 2008 Science Team Report recommendations seriously as DNR works toward balancing fiduciary duties and responsibilities as the HCP requires. The Sierra Club recognizes DNR’s challenge in managing sometimes competing interests and responsibilities and urges DNR to take very seriously its actions which result in

“take” of federally listed species or preclude future opportunities to contribute to the real recovery of these species. DNR’s vision is to leave a legacy of healthy forests, clean water, and thriving ecosystems while maintaining a vibrant natural resource-based economy. We ask DNR to be true to this vision, which must make room for both people and wildlife as we try to maintain and restore thriving ecosystems for generations to come.

**Response:** The marbled murrelet LTCS is being developed in a separate planning process and is outside the scope of this OESF forest land planning process. DNR manages state trust lands in the OESF in accordance with the HCP, which seeks to achieve a balance between revenue production and ecological values through an integrated management approach. For more information on integrated management, refer to pages 2-4 through 2-9 of the RDEIS.

## ■ Subject 13: Northern Spotted Owl

**No.:** 86

**Topic:** Compliance with HCP

**Source:** David Mann, OFCO, page 4; Dave Werntz, OFCO (and Conservation Northwest), pages 110 and 113; Mike Haggerty, OFCO, page 7

The proposed forest land plan fails to meet the conservation objectives for northern spotted owls and fails to meet the Endangered Species Act-mandated minimization and mitigation contained within the incidental take permits. The proposed landscape-level planning and RDEIS do not ensure that the OESF will be occupied by successfully reproducing northern spotted owls that function as a segment of the Olympic owl population. The forest land plan should be withdrawn until its deficiencies can be resolved.

**Response:** DNR is not required by law or policy to ensure the OESF is *occupied* by successfully reproducing northern spotted owls. DNR’s goal for northern spotted owl conservation, which is stated in the draft OESF forest land plan, is to “restore a level of habitat *capable of supporting* reproducing northern spotted owls that does not appreciably reduce the chances of survival and recovery of the northern spotted owl sub-population on the Olympic Peninsula” (emphasis added). This objective is consistent with the objectives of the northern spotted owl conservation strategy in the HCP.

**No.:** 87

**Topic:** Updating Management with Current Science

**Source:** Dave Werntz, OFCO (and Conservation Northwest), pages 110, 112, 117, and 118

When the HCP was adopted, it launched a unique project in the OESF. It proposed an experiment and crafted a strategy for integrating protection and conservation across the landscape, based on science and policy of the time. As an experiment, systematic application of new knowledge is a core purpose.

The forest land plan operates on the premise that DNR’s only obligation to owl conservation is defined by the working hypotheses and other HCP script. Given the OESF’s experimental design and adaptive management approach, DNR’s interpretation is not sound. Even if it were, DNR cannot ignore or fail to evaluate in its RDEIS the rich trove of biological information related to owl biology, demographics and recovery that has been produced since 1997.

Few of the assumptions underlying DNR’s conservation strategy for the OESF can withstand scrutiny today. Most of the factors related to owl population stability in the Olympics, such as the size and trends of the northern spotted owl sub-population on the Olympic peninsula, the existing distribution of northern spotted owls, and recent trends in occupancy on DNR-managed lands, have changed substantially since 1997. It was believed at the time, for instance, that the Olympic subpopulation of northern spotted owls was substantially larger, interconnected, and 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 population was secure (DNR 1997, p. IV.102). The HCP’s

heightened expectations of a stable owl population prompted “considerable flexibility in developing a conservation strategy for DNR-managed lands” (DNR 1997, p. IV.101).

None of these primary assumptions remain valid. Recent analysis on northern spotted owl demography performance in the Olympics indicate that northern spotted owls are not stable, and have declined at a rate of 4.3 percent a year between 1992-2008 (Forsman et al. 2011). Owl populations in the more rapidly declining populations, including the Olympics, dropped by 40 to 60 percent over a 10-year period (Forsman et al. 2011). Data has not been collected on DNR-managed lands since 2001, but occupancy rates of northern spotted owl territories in adjacent federal lands have declined by 60 percent between the early 1990s and 2008 (Gremel 2008).

Despite an abundance of new information and understanding about northern spotted owl biology and conservation, DNR has made no adjustments or revisions to its assumptions or working hypotheses, and it continues to rely on a scientifically-unsupportable management strategy. The failure to consider and apply best available science informing OESF owl conservation, including barred owl incursion, extreme weather events associated with climate change, importance of nest sites and high-value habitat, landscape habitat patterns and function, the draft salvage logging procedure, proposed changes to habitat definitions, and other factors strongly shaping owl survival and recovery and demographic support of the Olympic owl population, in association with plans to increase fragmentation, degrade, and destroy owl habitat, including nest sites, will have a probable significant adverse environmental impact that was not disclosed in the RDEIS. With new knowledge and information related to northern spotted owl conservation science, DNR must consider adjustments or revisions to its assumptions, working hypotheses, and landscape management techniques intended to provide demographic support to the Olympic northern spotted owl population.

The forest land plan’s reliance on faulty assumptions that conflict with basic and well-documented northern spotted owl biology and its failure to consider substantial owl threats would create conditions that appreciably reduce chances of owl survival and recovery.

**Response:** The HCP is current DNR policy, and changes to policies are outside the scope of this forest land planning process (refer to Comment 2). DNR will continue to implement the HCP in the OESF as long as that policy remains in place.

The OESF is an experimental forest; management is not meant to be static. DNR has a structured research and monitoring program through which it can explore the assumptions, working hypotheses, and landscape management techniques of the HCP. New information gathered through this program can be evaluated and applied to management as needed through the adaptive management process. Refer to Chapter 4 of the draft OESF forest land plan (Appendix A of the RDEIS) for more information

In developing this environmental analysis, DNR used the best data and information available at the time. Refer to Appendix I of the RDEIS, “Northern Spotted Owls,” for a description of the territory and stand-level models DNR used to evaluate habitat for this RDEIS and the scientific assumptions on which those models were based.

**No.:** 88

**Topic:** USFWS Northern Spotted Owl Recovery Plan

**Source:** Dave Werntz, OFCO (and Conservation Northwest), page 113

The forest land plan must incorporate and apply current northern spotted owl conservation policy. Although lands covered by HCPs are typically considered compliant with the Endangered Species Act if they provide for the conservation of key habitat areas and occupied sites (USFWS 2012, p. III-52), the forest land plan is a distinct anomaly. It is unique not just to DNR’s HCP, but to all HCPs. Through this subsequent planning process, which is just now being seriously initiated, DNR must actively adjust its plans and activities to incorporate and apply new social and ecological knowledge to meet its objectives. The planning process is designed to be dynamic, current, and evolving.

In 2012, USFWS issued its *Revised Recovery Plan for the Northern Spotted Owl*, finding that past habitat loss, current habitat loss, and competition from barred owls represented the most pressing threats to the northern spotted owl (USFWS 2012, emphasis added), and that the barred owl threat was “extremely pressing and complex, requiring immediate consideration.” (USFWS 2012, p. 1-8, emphasis added). USFWS reports that west-side provinces, including the Olympic Peninsula, scored high on threats from “the negative effects of habitat fragmentation and ongoing habitat loss as a result of timber harvest” (USFWS 2012, p. 1-8). The recovery plan included several recommendations for dealing with these threats, including conserving and restoring multi-layer forests, occupied sites, and unoccupied, high-value habitat.

With new knowledge and information related to northern spotted owl conservation policy, DNR must consider adjustments or revisions to its assumptions, working hypotheses, and landscape management techniques intended to provide demographic support to the Olympic owl population. DNR’s failure to incorporate new information is likely to have significant adverse environmental impacts that are not disclosed or considered in the RDEIS.

**Response:** The HCP is current DNR policy, and changes to policies are outside the scope of this forest land planning process (refer to Comment 2).

In the OESF, DNR currently defers over 43,000 acres of multi-layered old-growth forest. Also, under all of DNR’s alternatives, the amount of northern spotted owl habitat in the OESF is expected to increase.

Under DNR’s preferred alternative, the Pathways Alternative, DNR will apply management pathways to each landscape to achieve one or more of the following:

- Attain habitat thresholds more quickly than currently projected.
- Increase habitat patch size where possible.
- Where feasible, create habitat or accelerate habitat development in areas categorized as deferred in the tactical model to take full advantage of these areas.

Refer to Comment 87 for a discussion on implementing the HCP, and to Comment 104 for a discussion on competition between barred and northern spotted owls. Refer to Chapter 2 of the FEIS for a description of the Pathways Alternative.

**No.: 89**

**Topic: Even Apportionment Hypothesis**

**Source: Dave Werntz, OFCO (and Conservation Northwest), pages 111, 112, and 117**

One OESF objective for northern spotted owls is landscape management for demographic support: “occupancy by successfully reproducing northern spotted owls that are functional segments of the Olympic Peninsula subpopulation.” Several factors affect this goal, including spatial distribution of habitat, size and connectivity of habitat supporting successfully reproducing owls, and the scale and impacts of owl threats.

The notion (hypothesis) that “even apportionment of forest cover among stands in all stages of development” over time can provide demographic support for owl conservation is antiquated. It has been nullified. Northern spotted owl survival, fecundity, and abundance are higher in areas with greater amounts of Old Forest Habitat (Bart and Forsman 1992, Bart 1995). Large blocks of habitat supporting multiple pairs of owls are more likely to contribute to long-term owl survival and recovery than isolated blocks of habitat supporting only a few individual owls (for example, refer to Thomas et al. 1990, Carroll and Johnson 2008). Fragmentation of large blocks of habitat is associated with reduced demographic performance (Courtney et al. 2004), particularly on the Olympic peninsula where northern spotted owls have larger home ranges due to reliance on northern flying squirrels which have low population densities.

**Response:** Adjustments or revisions to the assumptions, working hypotheses (such as even apportionment), and landscape management techniques of the HCP are best addressed through DNR’s research and monitoring program and adaptive management process. Even apportionment does not necessarily equate to fragmentation; a landscape with fairly even apportionment between stand development stages may include large blocks of interior older forest. DNR’s analysis of the proposed forest land plan demonstrated that, over time, the number of acres of interior older forest in the largest patch category (over 1,000 acres) is expected to increase under the No Action and Landscape alternatives. Refer to pages 3-194 through 3-199 of the RDEIS for more information.

Under the Pathways Alternative, which is the new action alternative added to the FEIS, DNR will assign management pathways to each landscape to meet its objectives (refer to Comment 88). Most management pathways involve selecting forest stands for either active or passive management. In selecting stands, DNR will consider patch size and location relative to existing habitat. The Pathways Alternative is described in Chapter 2 of the FEIS.

**No.: 90**

**Topic: Unzoned Forest Hypothesis**

**Source: Dave Werntz, OFCO (and Conservation Northwest), pages 112 and 117**

Similarly without merit is the notion (hypothesis) that an “unzoned forest” can provide functional nesting habitat (supporting individual territorial northern spotted owls or clusters of northern spotted owl sites for stability and viability) for northern spotted owls. While a jumbled 20/40 habitat scheme may have appeared to provide for owl survival and conservation in 1997, a rich

body of scientific literature developed since then, including analytical techniques, related to northern spotted owl biology and demographics, indicates that is no longer the case. Northern spotted owls exhibit high nest site fidelity. Northern spotted owls with established territories are likely to be more successful if they remain in those territories (Franklin et al. 2000). Circles matter more than ever.

**Response:** With the adoption of the HCP in 1997, DNR transitioned from managing for owl circles to managing for habitat conservation on a landscape basis. This approach to northern spotted owl habitat was analyzed in the DEIS and FEIS for the HCP and approved by the Federal Services. Refer to Comment 91 for more information on owl circles.

The integrated management approach is based on the requirements of the HCP, which is current DNR policy. Changes to DNR policy, including reexamination of the management approach or conservation strategies of the HCP, lie outside the scope of this forest land planning process. Refer to Comment 2 for more information.

Many areas of Old Forest Habitat are also old-growth forests. Because old-growth forests are designated as long-term deferrals per current DNR policy (DNR 2006a, p. 34), they will remain on the landscape for as long as this policy remains in effect.

Under the Pathways Alternative, which is the new action alternative added to the FEIS, DNR will assign management pathways to each landscape. Most management pathways involve selecting forest stands for either active or passive management to help meet habitat thresholds. In selecting stands, DNR will consider patch size and location relative to existing habitat. For more information, refer to Chapter 2 of the FEIS.

**No.:** 91

**Topic:** Harvest and Analysis of Occupied and High-value Habitat

**Source:** Dave Werntz, OFCO (and Conservation Northwest), pages 113 and 115; Brian Windrope and Chris Karrenberg, Seattle Audubon Society, page 2

As currently proposed, the forest land plan aims to log between 3,300 and 16,000 acres of owl nest sites each decade (33,000 to 160,000 acres over 10 decades), despite the fact that owl nest sites are most likely to be re-occupied by recovering northern spotted owl populations. DNR does not utilize updated science on northern spotted owls. Seattle Audubon endorses the OESF RDEIS comment letter focused on northern spotted owls from Dave Werntz, Conservation and Science Director at Conservation Northwest.

Since owls continue to decline, face a severe threat from barred owls, and are experiencing loss in genetic diversity, USFWS recommends “conserving occupied sites and unoccupied, high-value northern spotted owl habitat on State and private lands wherever possible.” (USFWS 2012, p. III-51). USFWS determined that the need to conserve and restore large areas of contiguous, high-quality habitat across the range of the owl has intensified as a result of competitive pressure from barred owls (Fed Reg. Vol. 77, No. 233, p. 71879). Therefore, USFWS recommends “conserving and restoring older, multi-layered forests across the range of the spotted owl.” (USFWS 2012, p. 1 through 9). Retaining northern spotted owls at existing sites is an effective approach to

conserving northern spotted owls because owls in established territories are likely to be more successful if they remain in those locations (Franklin et al. 2000).

Protecting owl sites and high-value (structurally complex, nesting/roosting/foraging) habitat is entirely compatible with the OESF. Although the OESF has a goal of an unzoned forest, it emphasizes that the distinction between zoned and unzoned is not absolute “because there is a physical and biological zonation in forest landscapes that must be respected and that links directly to the processes and functions that the OESF seeks to understand” (DNR 1997, p. IV-81).

Given new scientific and policy information on the importance of existing owl sites and high-value owl habitat to owl survival and recovery, the forest land plan must conserve this habitat on the OESF. If these areas are not protected, the FEIS must evaluate impacts to owl survival and recovery, which are likely to be significant and adverse. Unfortunately, the forest land plan makes no effort to evaluate impacts of logging nest sites on meeting HCP and OESF conservation objectives, including demographic support to the Olympic owl population. Since DNR lacks surveys, impacts to occupied owl sites and unoccupied high-value habitat are unknown and not disclosed in the RDEIS.

**Response:** As part of implementing the HCP, DNR shifted from managing habitat in owl circles to managing habitat on a landscape scale. DNR and USFWS analyzed the impacts of harvest on northern spotted owl circles as part of the 1996 *Draft EIS for the Habitat Conservation Plan* and 1998 *Final (Merged) EIS for the Habitat Conservation Plan* (completed by DNR, USFWS, and NOAA Fisheries), and the USFWS biological opinion (USFWS 1997) completed for DNR’s HCP. All of these documents anticipate that management activities implemented under the HCP would result in incidental take of territorial northern spotted owls (refer to page p. 4-55 through 4-57 of the *Draft EIS for the Habitat Conservation Plan*). The USFWS incidental take permit (USFWS 1997) anticipated that each decade, between 3,330 and 16,300 acres of habitat in owl circles on state trust lands in the OESF would be harvested (owl circle, not nest sites; an owl circle is a simplified representation of an owl’s home range, represented by a circle with a 2.7-mile radius center at a nest or detection point).

In the RDEIS, DNR assessed the amount of harvest the analysis model recommended in owl circles in the **first decade only** of the analysis period under the No Action and Landscape alternatives as a way to assess the potential short-term impacts of the alternatives on northern spotted owls (refer to Table 3-61 on p. 3-220). **The acres shown in this table were used only to assess potential environmental impacts; they are neither management targets nor planned amounts of harvest in owl circles.** The amount of harvest shown in Table 3-61 falls within the range estimated for DNR’s incidental take permit. No Old Forest was recommended for harvest in any Status 1 Owl Circles in the OESF under either the any alternative in the first decade.

Environmental analysis of the proposed forest land plan can be found in the RDEIS. DNR did not include environmental analysis in the draft OESF forest land plan itself.

**No.:** 92

**Topic:** Amount of Structurally Complex Forest

**Source:** Dave Werntz, OFCO (and Conservation Northwest), pages 110, 116, and 117

The HCP requires the forest land plan to provide the necessary quality, quantity, and distribution of owl habitat in each landscape to provide demographic support for the long-term conservation of the Olympic northern spotted owl population. However, under either alternative, less structurally complex forest will be created than anticipated by the HCP. The HCP anticipated that DNR management would result in sufficient amounts of habitat to provide for multi-species conservation across the landscape covered by the HCP. In the OESF, it was expected that 60 to 70 percent of the OESF landscape would have structurally complex forest by 2100 (DNR 1997, p. IV.180). By contrast, the forest land plan predicts that the OESF will have only 26 percent structurally complex forest by 2100 (Chart 3-11, p. 3-41 in the RDEIS). It is not disclosed in the RDEIS how reducing the amount of suitable owl habitat, including nest sites, in the OESF landscape will contribute to northern spotted owl conservation. Given that habitat loss is a major threat to northern spotted owl conservation, the forest land plan will probably appreciably reduce chances of survival and recovery of the northern spotted owl population on the Olympic peninsula and foreclose options for ecosystem support provided by older forests.

As a result, the forest land plan is incompatible with the HCP. 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 RDEIS.

**Response:** The forest land plan was written to implement the HCP as well as all other current DNR policies and state and federal laws.

Table IV.14 on page IV.180 of the HCP used age classes as a surrogate for stand structure because stand age was the best data available at the time. Any stand over age 70 was assumed to be structurally complex. However, DNR does not currently believe that age alone is a good indicator of structure; two forest stands of the same age in different areas may have markedly different structure. Using stand age alone could result in significant overestimates of the amount of structurally complex forest in the OESF.

Today, DNR bases estimates of structurally complex forest on forest structure such as the presence of snags and down wood. To develop these estimates, DNR currently analyzes inventory data that was collected from sample plots in the OESF and projected into the future using forest growth simulators. As technology and methods change, DNR may adopt different methods using remote sensing data. Either way, DNR's current and future estimates likely will be different than those presented in the HCP.

As indicated in the RDEIS, the number of acres of northern spotted owl habitat in the OESF is projected to *increase*, not decrease over time as DNR makes progress toward meeting habitat thresholds. Refer to page 3-212 of the RDEIS for analysis results.

Refer to Comment 91 for a discussion on owl circles.

**No.:** 93

**Topic:** Exclusion of Non-Forested Acres to Calculate Thresholds

**Source:** Mike Haggerty, OFCO, page 23, 24, and 25

The number of acres of deferred and operable areas in each landscape (Table 3-3 in the RDEIS) excludes non-forested areas such as administrative sites, roads, and water bodies. These excluded acres are a major change in the way the OESF acreage is "measured" and is one area in which the forest land plan does not meet the minimum requirements of the HCP.

The HCP requires a minimum of 20/40 northern spotted owl habitat for DNR-managed lands in each landscape, not a subset of DNR-managed lands within the landscape. By excluding non-forested acres, DNR significantly reduces the acreage needed to implement the northern spotted owl conservation strategy in the HCP. Specifically, this approach reduces the minimum number of acres of habitat needed in the OESF to meet the HCP by 5,113 acres or 5 percent. Removal of these acres appears to have been done for the sole purpose of reducing the minimum number of acres of northern spotted owl habitat needed. Using this logic, the more roads you build, the fewer acres of habitat you need restore. Allow an unlimited number of roads, and you will not need to grow any Old Forest Habitat. Also, timber is extracted from the road right-of-ways during the creation of new roads and when old roads are reopened, thus yielding timber from areas that are not accounted for in providing northern spotted owl habitat.

One thing that is not excluded from Table 3-3 in the RDEIS is the actual surface area between stream channel banks of all except the very largest rivers (Hoh, Sol Duc, etc.). For example, the area contained within the bankfull width of the Clallam River upstream of (but not including) the estuary to the confluence with water resource inventory area 19.0144 is 100.4 acres (from Haggerty and NOLT 2011). All acres of DNR-managed lands are classified as forested, even though they are the banks and bed of a river. The total surface area of all stream channels is likely similar to the area of "non-forested" area removed from the "forested" landscape area calculation.

**Response:** The decision to exclude non-forested acres from totals used in the FEIS and RDEIS was specific to the environmental analysis and does not affect future management. To manage the OESF, DNR will not make any distinctions of whether state trust lands are forested or non-forested. Threshold calculations will be based on the number of acres of DNR-managed lands in a landscape.

**No.:** 94

**Topic:** Treating Habitat Thresholds as Targets

**Source:** Mike Haggerty, OFCO, page 24; Dave Werntz, OFCO (and Conservation Northwest), page 116

DNR treats threshold proportions (20/40) as targets, despite HCP direction that thresholds are not intended to be targets but minimum standards. The HCP states, "The currently proposed threshold proportions of potential northern spotted owl habitat are not intended to be targets for management, rather they are minimum standards that reflect the current understanding of forest-ecosystem processes" (DNR 1997, p. IV.88). However, this is not how the forest land plan will be implemented. The Landscape Alternative directly targets the minimum requirements for Old Forest in several of the landscapes, and it fails to meet these minimum requirements in the

Clallam landscape. Table 3-58 shows a projection of 3,485 acres of Old Forest at Decade 9 for the Landscape Alternative. It achieves the minimum target based on DNR's recalculation of the "forested" area within the landscape. The minimum target is achieved in Decade 5 and never exceeds 20 percent for the duration of the plan. By comparison, the HCP estimates that 37 percent of the landscape will be Old Forest by Decade 10. So, not only has DNR redefined how they calculate 20 percent, they are treating this threshold as a maximum management level in the Clallam landscape, when because of the exclusion of non-forested acres, they are not even meeting the minimum management threshold at the end of the planning period. The 3,485 acres of Old Forest they are modeling to exist at Decade 9 is only 19.3 percent of the DNR-managed land within the Clallam landscape. Also, note that modeled habitat often includes stands that have experienced severe windthrow damage and no longer function as habitat. Management to threshold targets is likely to further imperil northern spotted owls.

**Response:** The HCP states that during the maintenance and enhancement phase, DNR will maintain the proportion of Young and Old Forest Habitat at or above 40 percent in each landscape (DNR 1997, p. IV.100). Per the HCP and DNR's incidental take permit, DNR may harvest habitat in excess of thresholds in any landscape of the OESF so long as thresholds are maintained. This flexibility is part of the experimental management concept of the OESF.

DNR anticipates that, due to harvest deferrals in the OESF, some landscapes may exceed Old Forest Habitat thresholds indefinitely. Many areas of Old Forest Habitat are deferred from harvest because they are also old-growth forest, for example. In these landscapes, if Old Forest Habitat develops in other areas that are deferred from harvest, the proportion of the landscape that is Old Forest Habitat may increase.

The HCP based its estimates on stand age, not structure, which was the best information available in 1997. Today, DNR does not consider stand age an effective surrogate for estimating either stand development stage or habitat status; refer to Comment 92 for more information. DNR bases habitat estimates on stand structure instead, which accounts for differences between current estimates and those presented in the HCP.

When DNR implements its forest land plan it will include non-forested acres when calculating habitat thresholds, as discussed in Comment 93.

**No.:** 95

**Topic:** Decades that Old Forest is Retained

**Source:** Gary Bell, WDFW, page 4 to 5

Criteria should be enacted for the number of decades that Old Forest is to be retained and available as ecologically functional habitat prior to harvest as anticipated by the forest estate model (minimum two decades? More?). Both owls and murrelets have site fidelity to established nesting areas, and we have concerns as to whether or not there would be adequate time (number of decades) for owls or murrelets to make use of new, suitable Old Forest patches (that is, successfully reproduce) within their lifespan.

**Response:** DNR appreciates the suggestion but will continue to follow current policy. However, as explained in Comment 94, in most landscapes a large proportion of existing Old Forest Habitat is deferred for other reasons (for example, as old growth stands). Such habitat will remain on the landscape regardless of thresholds so long as current policies remain in place.

**No.:** 96

**Topic:** Time Necessary to Meet Thresholds

**Source:** Mike Haggerty, OFCO, page 28

The model does not appear to have constraints that minimize the time required to achieve Old Forest conditions.

**Response:** DNR did not constrain the analysis model to achieve the Old Forest threshold by a specific decade because the HCP does not require DNR to do so. The constraint used to develop the analysis model is described on page D-79 of Appendix D to the RDEIS.

**No.:** 97

**Topic:** Landscapes That Exceed Habitat Thresholds

**Source:** Tom Partin, AFRC, page 10

Regarding the 20/40 graphs in Appendix A which show the thresholds, why does the percentage of Old Forest continue to climb in some landscapes after those landscapes reach the 20 percent threshold? Would it be incorrect to assume that as the riparian area contribution to the 20 percent threshold increases, the upland contribution could be reduced?

**Response:** Once the 20/40 thresholds are met in a given landscape, Old Forest Habitat not needed to meet or maintain those thresholds becomes available for harvest. Old Forest Habitat that develops in riparian areas may, over time, reduce the amount of habitat needed in the uplands in some landscapes. DNR expects the proportion of Old Forest Habitat in some landscapes to increase over time due to deferrals. Refer to Comments 94 and 95.

**No.:** 98

**Topic:** Timeline for Meeting HCP Requirements

**Source:** Christopher Mendoza, Mendoza Environmental, LLC, page 11

What is unclear is the timeline under which the DNR's incidental take permit is granted (50 years) and whether, and if so how, that timeline factors into DNR's analysis of potential environmental impacts, most of which DNR has determined to be "low."

If one of the HCP's goals is to provide northern spotted owl habitat to meet the owls' life history requirements, meeting that goal by Year 50 will have very different implications for harvest planning (for example, selection of silvicultural regimes) than meeting that objective by Year 90. Chart 3-83 in the RDEIS indicates that projected acres of northern spotted owl habitat for movement remain relatively constant from years 50 through 90, with foraging increasing slightly, and roosting increasing more so, before dropping over the same timeframe. However, total acres

of nesting habitat increases substantially between years 50 and 90, indicating a potential “bottleneck” to species viability and reproduction, since increases in the other three habitat types become irrelevant if nesting habitat is limited to the extent that the species is no longer viable. DNR speculates, “The slow increase in the number of acres for nesting may be due to the time it takes forests to develop elements of structural complexity such as large snags and downed wood” (RDEIS, page 3-215).

The implications for short- and long-term harvest planning under DNR’s silvicultural regimes are substantial if, for example, the projected acres of northern spotted owl nesting habitat from Chart 3-83 in Decade 9 are instead required to be met in Decade 5 (the life of the HCP). That change would directly affect (reduce) the number and type of forest management units that could be harvested if the nesting acreage “target” essentially got moved up 40 years from Decade 9 to Decade 5. Conversely, if the nesting acreage target got moved out to say 150 years, that would affect (increase) harvest rates of potential habitat and older forest stands as forest managers would have more time to meet that target.

The question for the Federal Services would be what, exactly, those targets are (for example, projected acres of northern spotted owl nesting habitat) and when they have to be attained (end of the HCP, 50, 100 years?). The current condition (population viability) of the species in question also should be taken into consideration, and how changes in population dynamics could impact short- and long-term forest management planning.

**Response:** DNR manages each landscape in the OESF per the 20/40 northern spotted owl habitat thresholds. Neither the HCP itself nor DNR’s incidental take permit specify a decade in which thresholds must be met, although the HCP assumed it could take up to 80 years to reach Old Forest Habitat thresholds (DNR 1997, p. IV.100). The HCP bases its estimates on reaching thresholds on stand age alone (refer to Comment 92).

Under the Pathways Alternative, DNR will select stands of non-habitat in deferred and operable areas for active management. These stands will be thinned to create or accelerate the development of Young Forest Habitat. Thinning these stands may also put them on a trajectory to reach Old Forest Habitat status more quickly than if they had not been thinned. DNR anticipates that the Pathways Alternative may result in some landscapes reaching habitat thresholds sooner than currently projected under the No Action or Landscape alternatives.

For an explanation of DNR’s modeling constraints for Old Forest Habitat, refer to Appendix D to the RDEIS.

**No.:** 99

**Topic:** Timeline for Meeting HCP Requirements

**Source:** Gary Bell, WDFW, page 3

We are concerned about whether all of the landscapes can meet the 40 percent young sub-mature forest/Old Forest thresholds by the end of the HCP in 2067 (assuming year 2009 starting as Decade 0, we calculated the HCP end point as roughly Decade 5.7). Assuming the current model predictions under the proposed forest estate model with no modifications, 2 of the 11 landscapes

will not meet the 40 percent minimum threshold by the end of the HCP, and 3 of 11 will not meet the Old Forest 20 percent threshold (Table A-12, page 83 of the forest land plan).

**Response:** Neither the HCP itself nor DNR’s incidental take permit specify a decade in which thresholds must be met.

The time it takes for each landscape to meet the Old Forest Habitat threshold depends largely on current conditions. Extensive harvest on the west side of the Olympic Peninsula began around 1920 and continued through the 1980’s (National Park Service 2016). Areas that were easily accessible and located at lower elevations were harvested first, beginning with areas near the coast and tidal rivers. The method used was clearcutting, in which little to none of the original forest remained after harvest. These harvests were carried out under a different set of policies and objectives than are currently in place. Forests in landscapes that were clearcut and replanted as forest plantations will take the longest to develop the structure required to be considered Old Forest Habitat.

**No.:** 100

**Topic:** Lack of Analysis in Forest Land Plan

**Source:** Dave Werntz, OFCO (and Conservation Northwest), page 114; David Mann, OFCO, page 4

The forest land plan fails to demonstrate how HCP objectives are attained 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 HCP sets an objective of a landscape management that supports “occupancy by successfully reproducing northern spotted owls that are functional segments of the Olympic Peninsula subpopulation.” But the OESF forest land plan’s owl section contains no information, quantitative analysis, or scientific information on whether or not this objective is being pursued or could be achieved. What are the owl’s chances for survival and recovery in the OESF? Is it reduced? Is it appreciably reduced?

**Response:** The purpose of the forest land plan is to provide foresters and managers the information they need to manage the OESF on a day-to-day basis. The draft OESF forest land plan (Appendix A to the RDEIS) includes goals, measurable objectives, and strategies for the northern spotted owl conservation strategy, all of which are based on the requirements of the HCP. Refer to pages 40 through 45 of the draft OESF forest land plan for more information.

DNR will assess the effectiveness of its strategies through the research and monitoring program. If changes need to be made, they will be made through the adaptive management process.

The potential environmental impacts of implementing the forest land plan are assessed in the RDEIS and FEIS. In that document, DNR analyzed the amount of northern spotted owl habitat, support for life history requirements, and modeled, potential northern spotted owl territories that may result from implementing the plan. All potential impacts were rated low.

**No.: 101**

**Topic: Inadequate Analysis in RDEIS: Acres Supporting Life History Requirements**

**Source: Dave Werntz, OFCO (and Conservation Northwest), pages 114**

In modeling acres of northern spotted owl habitat, DNR assigned each landscape an impact rating based on the projected change in habitat amount. However, the rating system is inadequate for evaluating occupancy by successfully reproducing owls, or owl chances of survival and reproduction.

First, DNR does not provide information or analysis on how a minimum score of 50 specifically relates to owl habitat function as roosting, nesting, foraging, or dispersal habitat; nor does it provide any scientific basis for the habitat scores used in its analysis.

Second, whereas the HCP sets an objective for stands ecologically functioning as “dispersal, foraging, roosting, and nesting habitat for spotted owls,” the forest land plan contains no assessment of the composite of ecological functions in stands modeled as movement, roosting, foraging, or nesting habitat. DNR does not provide an analysis of how these stands function in concert as a whole on the landscape to shape owl survival and recovery.

**Response:** For the RDEIS, DNR developed stand-level models to analyze each of the northern spotted owl’s life history requirements (roosting, foraging, movement, nesting) separately. Each stand-level model consisted of a set of measurable indicators. For example, the roosting model consisted of the indicators tree height, forest composition, canopy cover, and thermoregulation. Each indicator was scored individually, and then all indicator scores were normalized within the model and combined for an overall score for the life history requirement being modeled. Scores above 50 indicated support for that life history requirement. Higher scores meant more support. A score below 50 indicated the habitat did not support the requirement in question.

For each indicator, DNR provided the rationale for choosing that indicator, literature cited, data sources used, how the indicator was measured, and the evaluation criteria used. Refer to Appendix I to the RDEIS for more information. DNR provided full documentation of these models, including their scientific basis, to make this analysis process more transparent.

To better understand how well the entire OESF will support northern spotted owls over time, DNR also developed a territory model. The territory model was used to evaluate habitat quality using a habitat score that was averaged from the results of the stand-level model for *all four* life history requirements.

The territory model identified likely areas where viable northern spotted owl territories could exist. While it is unlikely that actual northern spotted owls will behave as predicted by the model, the model provided an objective, repeatable index to assess the effects of forest management. The distribution of potential territories over time indicated an increase in the capability of state trust lands to support northern spotted owl territories in the OESF. The territory model (and its scientific basis) also is described in Appendix I.

**No.:** 102

**Topic:** Distribution of Habitat Analysis

**Source:** Dave Wertz, OFCO (and Conservation Northwest), pages 115 and 116

While the RDEIS does provide some information on the quantity of forest types that are predicted by various DNR models, it does not indicate how the shift of habitat patterns in landscapes over time affects HCP objectives for northern spotted owl survival and recovery.

The forest land plan anticipates increased edge effects (p. 3-195), increased habitat fragmentation (for example, decreased patch size of interior forest conditions) (p. 3-196), and increased abundance of small 100 to 250 acre patches (p. 3-197), but makes no effort to evaluate impacts to northern spotted owls from these well-recognized threats. Failure to provide information on the distribution of owl habitat over time, to ensure that interior forest conditions over time are sufficient to provide northern spotted owl demographic support, 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 RDEIS.

**Response:** For the RDEIS, DNR developed stand-level models to analyze each of the northern spotted owl's life history requirements (roosting, foraging, movement, nesting) separately. To better understand how well the OESF supports northern spotted owls, DNR also developed a territory model. The territory model evaluated habitat quality using a habitat score that was averaged from the results of the stand-level model for all four life history requirements. The territory model identified likely areas where viable northern spotted owl territories could exist. This analysis considered both territory size and potential overlap of territories with neighboring territories. For a detailed description of the stand and territory models, refer to Appendix I to the RDEIS.

In addition, DNR conducted an analysis of interior older forest patch size in "Wildlife" in Chapter 3 of the RDEIS. While interior older forest is not the same as Old Forest Habitat, DNR believes that it supports a range of species dependent on older forest conditions, including northern spotted owls.

**No.:** 103

**Topic:** Active Management to Accelerate Development of Habitat

**Source:** John Gold, Sierra Pacific, page 2; Tom Partin, AFRC, page 9

It is not clear if thinning or other harvest treatments to accelerate development of young forest marginal and Old Forest Habitat were analyzed. Was any modeling conducted to evaluate the potential to accelerate the 20/40 habitat objective through management of stands? The documentation states that the 20/40 habitat objective was modeled using no management activities, and that "no management" was assumed to most quickly reach those goals. It is consistent with OESF goals to utilize active management to further conservation objectives.

**Response:** Although DNR did not model or analyze silvicultural treatments to accelerate habitat development, DNR has the option to apply those treatments. DNR's

new action alternative, the “Pathways Alternative,” includes thinning in some forest stands to create or accelerate development of habitat. Refer to Chapter 2 of the FEIS for more information.

**No.: 104**

**Topic: Analysis of Barred Owls**

**Source: Dave Werntz, OFCO (and Conservation Northwest), pages 113 and 117**

Barred owls compete directly with northern spotted owls for habitat and resources for breeding, feeding, and sheltering. Research has shown that northern spotted owl occupancy and colonization rates decreased as barred owl presence increased and available habitat decreased (Dugger et al. 2011).

The forest land plan acknowledges increasing population size and threats from barred owls including exclusion and displacement of northern spotted owls by barred owls (Gremel 2008) and negative effects on northern spotted owl survival on the Olympic peninsula (Anthony et al. 2006), but makes no effort to adjust management activities or evaluate ongoing and future impacts on northern spotted owls from barred owls.

DNR’s contention that evaluating impacts of competition is not feasible (p. 3-221) lacks credibility given the numerous analyses of barred owl effects on northern spotted owls (for example, refer to Forsman et al. 2011; Anthony et al. 2006).

**Response:** DNR recognizes the challenge posed by competition between barred and spotted owls. Although studies are being conducted, the degree to which competition with barred owls will affect northern spotted owl recovery is not fully understood (Gutierrez and others 2006). Addressing the threat from habitat loss is relatively straightforward with predictable results. However, addressing a large-scale threat of one raptor to another, closely related raptor has many uncertainties (USFWS 2011). For example, although the impacts of barred owls on northern spotted owls are well documented (Duggar and others 2011, Forsman and others 2011, USFWS 2011), little is known about how forest management might influence the competition between these species. Recent studies of barred owl removal from previous northern spotted owl territories have shown that northern spotted owls reoccupy these territories when barred owls are removed (Diller and others 2016). However, this study did not include data on how forest management activities might influence the interaction between these two species. In addition, in long-term demographic studies the National Park Service continues to find barred owls throughout Olympic National Park. These owls are found in territories previously occupied by northern spotted owl in areas where management activities have not taken place.

For these reasons, DNR determined that an analysis of the potential impacts of the alternatives on competition between these two species was not feasible.

**No.: 105**

**Topic: Accuracy of Proposed Northern Spotted Owl Mapping and Modeling Approach**

**Source: Mike Haggerty, OFCO, pages 46 and 47**

Under the Landscape Alternative, DNR proposed a new approach to mapping and modeling northern spotted owl habitat in the OESF using the forest estate model. This approach, which relies on modeled outputs versus on-the-ground conditions, requires a tremendous amount of faith in a model that often does not reflect current conditions. Problems with DNR’s approach can be demonstrated by an examination of northern spotted owl habitat in the Clallam landscape.

One example is a forest stand that is partially included in the “Stumpy’s Ride” timber sale, on which I provided comments earlier this year. During the final SEPA determination (Feb 11, 2013, SEPA File No. 12-11202) DNR concluded that the stand was not structural habitat. Now DNR is mapping the stand as Old Forest. It is difficult to reconcile how two vastly different determinations can be made in a single year.

Overall within the Clallam landscape, the proposed approach yields a significantly different amount of Old Forest Habitat (314 acres) than the current approach (0 acres). Several stands projected to be Old Forest in Decade 6 of the Landscape Alternative have been recently regenerated. In an additional 8 examples, areas predicted to be Old Forest Habitat by Decade 6 in the forest estate model were regenerated between 2001 and 2012, are being regenerated now, or are scheduled for regeneration harvest in 2014. I estimate that roughly 9 percent of the projected Old Forest in Decade 6 will be between 60 and 70 years old, including stands that have experienced greater than 50 percent canopy loss from windthrow. There is a serious problem with the modeling of future Old Forest conditions based on current stand conditions. The modeling work needs to be redone in order accurately predict future Old Forest conditions.

**Response:** For the RDEIS analysis, DNR used the best data available at the time. The tactical model, which will be used during implementation, will be updated with data that accounts for harvest since the analysis model was run.

DNR has developed a new forest inventory system based on LiDAR and PHODAR data and sample plots. This system, called the “Remote Sensing Forest Resource Inventory System” (RS-FRIS), will replace DNR’s existing inventory system and be used as input data for the tactical model. DNR is investigating ways to use RS-FRIS to better characterize older forest stand conditions. Also, for the tactical model DNR will use an updated forest vegetation simulator (FVS) tree mortality model.

Additional information may be gathered from field sampling as part of other ongoing and planned monitoring projects. For example, the project “Status and Trends Monitoring of Riparian and Aquatic Habitat in the OESF” includes tree sampling in one hundred, 30 by 60 meter plots in riparian forests across the OESF.

**No.:** 106

**Topic:** Mapping and Harvesting of Older Stands in the Clallam landscape

**Source:** Mike Haggerty, OFCO, page 29; Don Hamerquist and Janeen Porter, OFCO, page 150

DNR arbitrarily and illogically maps younger and less complex stands as structural habitat while systematically harvesting stands that have structural habitat characteristics or are close to being Old Forest, as illustrated by Unit 1 of the timber sale “Stumpy’s Ride” in the Clallam landscape. Indeed, there appears to be a push to increase the harvest of older stands in the Clallam. Some of the older (90 years or older) stands that have been harvested in the Clallam since 2007 may have been structural habitat but were not mapped as such. Recent harvest of older stands, the more intensive harvest proposed for the future, and reduced buffer widths have delayed the time to reach 20 percent Old Forest conditions and are in part responsible for the high impact rating for the Clallam landscape.

**Response:** For the RDEIS analysis, DNR used the best data available at the time. Refer to Comment 105 for more information.

The high impact rating for the Clallam landscape was for the indicator “harvest method and number of forest stand entries,” which was analyzed under “Forest Conditions.” The number of forest stand entries in the Clallam is based on the analysis model’s optimal solution for producing revenue and meeting its ecological objectives. The analysis model was not constrained to the current sustainable harvest level and represents a harvest level that is higher than the current level of 576 MMBF. Refer to Comment 52 for more information.

**No.:** 107

**Topic:** Harvest of Existing Habitat

**Source:** Coleman Byrnes, page 1

Current DNR timber sales are allowing good owl trees to be cut. These stands too often are not identified as owl habitat on timber sale documents. When owl habitat is delineated in these documents, these delineations too often include trees that make for substandard habitat.

**Response:** For the RDEIS analysis, DNR used the best data available at the time. Refer to Comment 105 for more information.

**No.:** 108

**Topic:** Existing Demographic Models

**Source:** Dave Werntz, Conservation Northwest, page 9

DNR must avail itself of existing demographic models, including the MaxEnt model used by the Northern Spotted Owl Implementation Team and others, to evaluate the effects of its forest land plan on northern spotted owl demography.

**Response:** For the northern spotted owl analysis, DNR chose to use a different model than MaxEnt. For the analysis, DNR developed a territory model based on the movement and territory packing models described in the British Columbia Ministry of

Forest and Range Technical Report #038 (Sutherland and others 2007). The modeling assumptions, process, and spatial output are similar to those described in Sutherland and others (2007). Refer to Appendix I of the RDEIS for more information.

**No.:** 109

**Topic:** Comparison of Mapped and Projected Acres of Habitat

**Source:** William Fleck, City of Forks, page 6

The City requests that DNR compare the number of acres of Old Forest Habitat mapped by Horton et al (discussed on page 41 of the forest land plan) to the number of acres projected by DNR’s northern spotted owl habitat models to determine if both are relatively close in their acreage estimates or widely disparate.

**Response:** This analysis has been completed and can be found in Appendix A-6 of the draft OESF forest land plan (Appendix A of the RDEIS). In this appendix, DNR compares the number of acres of Old Forest Habitat mapped by Horton et al (referred to in Appendix A-6 as the “current approach”) to the number of acres of Old Forest Habitat projected in the analysis model (referred to in Appendix A-6 as the “proposed approach”). The proposed approach includes all the acres of Old Forest Habitat mapped by Horton et al plus additional acres that the analysis model projects will develop over time. Under the proposed approach, DNR identified 42,736 acres of Old Forest Habitat, which is 2,234 acres more than the current approach.

**No.:** 110

**Topic:** Northern Spotted Owl Modeled Home Range Size

**Source:** Dave Werntz, OFCO (and Conservation Northwest), page 114

In modeling northern spotted owl territories or home ranges, the forest land plan allocated 7,400 acres for a northern spotted owl home range and allows those ranges to overlap by 25 percent. As a result, modeled home ranges were 5,550 acres. The median size of an annual home range for a real northern spotted owl on the Olympic peninsula is 12,424 acres (Forsman and others 2007), which is two and a quarter times larger than DNR’s modeled owl home range. These modeling inputs for owl home range size vastly overestimate the OESF’s potential contribution to support for the Olympic population of owls, and vastly underestimate the probability of significant adverse environmental impacts, introducing uncertainty about the scientific rigor of data and assumptions in other models used in the OESF analysis.

**Response:** A home range is the geographic area to which an owl normally confines its activity, while a territory is the portion of the home range that the owl defends.

The approach DNR used to develop the northern spotted owl territory model is consistent with the methodology used in British Columbia Ministry and Forest and Range Technical Report #038 (Sutherland and others 2007). DNR’s territory model uses a territory size of at least 7,400 acres and as many as 27,300 acres (refer to Appendix I, p. I-193). DNR’s lower value (7,400 acres) was modified from the value of 7,435 acres (3,010 ha) found in Table 3 on page 23 of that report (Sutherland and others 2007). The

value DNR used (7,400 acres) represents 52 percent of the median northern spotted owl home range in the Olympic Peninsula (14,232 acre [5,760 ha]).

The value from Table 3 (Sutherland and others 2007) was slightly modified from the value used in Spotted Owl Habitat in Washington: a Report to the Washington Forest Practices Board (Hanson and others 1993), which DNR cited in Appendix I. The value used in the Hanson and others (1993) report was based on telemetry data (unpublished at the time) that Eric Forsman collected for his late 1980s study on the western Olympic Peninsula. Eric Forsman's telemetry data later became the basis for a peer reviewed publication (Forsman and others 2005). The Forsman and others (2005) report found that the annual ranges of paired owls (union of annual male and female) averaged  $2,397 \pm 558$  ha for the 75 percent fixed kernel (FK) (median = 1,570 ha),  $5,449 \pm 1,111$  ha for the 95 percent FK (median = 4,081 ha), and  $5,414 \pm 895$  ha for the minimum convex polygon (median = 5,032 ha).

Forsman and others (2005) did not report on the amount of potential habitat in northern spotted owl home ranges; however, they did note that 4.3 km radius circles (in other words, 2.7 mile "owl circles"), centered on pair sites, encompassed  $3,105 \pm 236$  ha ( $7,673 \pm 583$  ac). This size is consistent throughout the model.

The DNR territory model allowed for up to 25 percent territory overlap, although this overlap was not a condition for all territories. The 25 percent overlap was also from Table 3, page 23 in the British Columbia report (Sutherland and others 2007). In cases where territories overlapped more than 25 percent, DNR eliminated lower quality territories to prevent counting multiple territories in the same location. Not all territories overlapped with other territories.

**No.:** 111

**Topic:** Management Based on Core Areas

**Source:** Dave Werntz, OFCO (and Conservation Northwest), page 114

DNR allowed northern spotted owl home ranges to overlap by 25 percent. While there is evidence of owl home ranges overlapping in the Olympics, researchers emphasized that these overlapping home ranges should not be misconstrued as a recommendation to manage owls based only on "core" areas. In particular, for lands managed for owl survival and reproduction, such as the OESF, management "should be based on amounts of habitat within the entire home-range areas ... not just core areas." (p. 375 in Forsman and others 2005).

**Response:** DNR developed a territory model to analyze the potential environmental impacts of its proposed forest land plan. This model was not intended as a tool for managing the OESF. DNR does not manage the OESF by core areas; DNR manages the OESF by the 20/40 northern spotted owl habitat thresholds.

The territory model was based on territories, which are different than home ranges. Refer to Comment 110 for more information.

**No.:** 112

**Topic:** Habitat Mapping and Modeling/Polygon Misclassification

**Source:** Gary Bell, WDFW, page 2

Based on the tables in Appendix A-6, WDFW calculated some significant differences in predicted northern spotted owl habitat between the current model planning layer and the proposed forest estate model-predicted habitat acres. Depending on the landscape, the proposed forest estate model predicts more (for example, 2.4 times more in Clallam, 1.5 times more in Clearwater, 1.3 times more in Reade Hill, and 3.6 times more in Sekiu) young sub-mature forest than the current model layer. Overall, there are increases in predicted habitat in 10 of 11 OESF landscapes using the proposed model as compared to the current model for both Old Forest and young sub-mature forest. Given the uncertainties of this disparity between predicted acreages, it appears that the current model layer may underestimate habitat or the proposed model may overestimates habitat (for example, Map A6-1, Clallam landscape). It seems most likely that both are occurring, which leads to less confidence in the predicted habitat outcomes.

Another complication that could be occurring is that the forest resource inventory system (FRIS) polygon delineations used to delineate the owl habitat polygons may have multiple age classes within some polygons, and thus, may not always align with forest inventory data plots. WDFW's assessment of marbled murrelet survey polygons (composed of  $\geq 1$  FRIS polygons) in the Straits planning unit demonstrated this to be a source of error when the habitat model was applied to the landscape (in other words, platforms not present; younger age classes next to older age classes within a polygon). We believe this error to be a significant factor in misclassifying marbled murrelet habitat within that landscape (Desimone et al. 2013). While the inventory plot data may be considered by DNR to be adequate for the most part, it is the combination of the above concerns that lead us to propose that DNR conduct some research and monitoring to help reduce model uncertainty and improve habitat predictability. Research and monitoring would allow DNR to take steps on the ground to rectify model prediction inaccuracies for both false positives and false negatives.

If the polygon misclassification problem is inherent and carried forward, it may continue to make future modeled habitat predictions problematic. WDFW recommends a simple model field validation: take a random sample of FRIS polygons predicted by the proposed forest estate model as young sub-mature forest to assess whether these samples meet northern spotted owl habitat definitions. This validation will help determine the degree of risk for incorrect habitat classifications. DNR could then use this data to better inform the model and refine habitat estimates.

**Response:** DNR continues to improve and update the models it uses. For example, for the tactical model DNR will use an updated forest vegetation simulator (FVS) tree mortality model. In addition, DNR has developed a new forest inventory system based on LiDAR and PHODAR data and sample plots. This system, called the "Remote Sensing Forest Resource Inventory System" (RS-FRIS), will replace DNR's existing inventory system and will be used as input data for the tactical model. DNR is investigating ways to use RS-FRIS to better characterize older forest stand conditions.

Additional information may be gathered from field sampling as part of other ongoing and planned monitoring projects. For example, the project “Status and Trends Monitoring of Riparian and Aquatic Habitat in the OESF” includes tree sampling in one hundred, 30 by 60 meter plots in riparian forests across the OESF.

**No.:** 113

**Topic:** Use of Model Inventory Method to Inform Forest Estate Model

**Source:** Gary Bell, WDFW, page 3

WDFW is concerned that using the model inventory method as described in Section 1 of the Washington Forest Practices Board (WFPB) Manual to inform the forest estate model could be a problem because the data used to develop that model was gathered exclusively in Southwest Washington on private industrial forest and may not be appropriate for modeling growing conditions in the OESF. Although used in the WFPB Manual, there has been no further model refinement or validation to substantiate its effectiveness outside of Southwest Washington. The polygon ground-verification study we recommended for reducing model uncertainty and improving habitat predictability could also help refine this part of the model and reduce uncertainty in predicting future forest structure. The “stand structure complexity index” is an untested assumption, and should require some monitoring by DNR.

**Response:** Refer to Comment 112.

**No.:** 114

**Topic:** Habitat in Riparian Areas

**Source:** Marcy Golde and Hellmut Golde, Ph.D., OFCO, page 73

The HCP foresaw interior-core and exterior buffers, with exterior buffers on 75 to 85 percent of streams. Note that these buffers were assumed to provide 50 percent of all northern spotted owl habitat. No additional northern spotted owl habitat has been added as the buffers became smaller over time.

**Response:** Buffer widths have no impact on the amount of habitat DNR must provide under any alternative; regardless of buffer widths DNR must meet the 20/40 northern spotted owl habitat thresholds in each landscape of the OESF. Refer to Comment 151 for a discussion on exterior buffer application.

**No.:** 115

**Topic:** Recovery Plan for Northern Spotted Owls

**Source:** Coleman Byrnes, page 1

DNR, as a signatory party to the HCP, is obliged to have a recovery plan for northern spotted owls. Where is it?

**Response:** Development of a recovery plan for the northern spotted owl is the responsibility of USFWS. The USFWS recovery plan for northern spotted owls was published in 1992 and revised in 2011. DNR remains in compliance with the Endangered Species Act by implementing its HCP.

## ■ Subject 14: Northern Spotted Owl and Marbled Murrelet

**No.:** 116

**Topic:** Habitat Fragmentation

**Source:** Don Hamerquist and Janeen Porter, OFCO, page 150

DNR proposes to meet objectives for northern spotted owl and murrelet habitat through the protection and expansion of Old Forest Habitat suitable for these species. However, DNR management in the Clallam landscape has resulted in substantial reductions of existing owl and murrelet habitat and acceleration of harvest of those stands that are closest to becoming Old Forest Habitat. This reduction been done directly through harvest, and indirectly through the degrading impacts of harvest-related collateral wind damage and segmentation of larger stands into discrete blocks that are too small to function effectively.

For the “Blowder Creek” and “Blowder Ridge” harvests, DNR has, or will soon cut portions of the 70-acre “best habitat” around a previously occupied northern spotted owl nesting site. For other harvests, including “Mustard and Relish,” “Big Country,” “Big Foot,” “Courtyard,” “1600 Blowdown,” “Blew Again,” and “Rooster 30 Thinning,” DNR has cut or degraded significant areas of mapped owl habitat. We doubt that this is a complete list of such harvests. The currently active “Blowder Creek” harvest includes a rebuilt road and a major bridge that bisects one of three occupied murrelet sites in the landscape. “Courtyard,” “Stumpy’s Ride,” “Clallam Combined,” “Clallam Burn,” “Big Country,” “Big Foot,” and a number of earlier forest practices applications impact and segment mapped murrelet habitat, including some stands that are adjacent to the other two occupied murrelet sites in the landscape. Numerous forest practices applications, notably “Stumpy’s Ride” Unit 1, have logged or propose to log in or adjacent to Old Forest murrelet habitat on the flyways up Charley Creek and the Little Hoko River to the three occupied sites. The impacts of these management actions is a substantial reduction of functional habitat for these vulnerable species for decades into the future. These obvious examples of effectively reducing owl and murrelet Old Forest and structural habitat are made more striking by the absence of any meaningful efforts to increase such habitat in other locations.

**Response:** In the RDEIS and FEIS, for each subject area DNR analyzed current conditions, which are the result of past harvest, natural disturbance, and natural forest growth. DNR then considered long-term ecological changes across state trust lands in the OESF that may result from implementing each alternative over time. For example, DNR considered how each alternative may affect riparian conditions across state trust lands in the OESF over 10 decades.

However, DNR analyzed these impacts at a landscape, rather than a site specific scale. DNR did not conduct a site-specific analysis of individual management activities such as individual timber sales or the construction of specific sections of roads because development of a forest land plan is a non-project action. Non-project actions regulate or guide future on-the-ground actions, but do not include design of specific activities.

Under the Pathways Alternative only, DNR will assign management pathways to landscapes to help meet northern spotted owl objectives. For the purposes of this environmental analysis, DNR made a preliminary selection of pathways for each landscape using analysis model outputs.

DNR's preliminary selection for meeting the 20 percent Old Forest threshold in the Clallam landscape was Pathway 4. Under this pathway, DNR will select stands of existing Young or Old Forest Habitat in operable areas for passive management, meaning these stands will not be scheduled for either thinning or stand-replacement harvest for as long as this pathway remains in effect. DNR will consider patch size when selecting stands under this pathway. Refer to Chapter 2 of the FEIS for more information.

**No.:** 117

**Topic:** Collateral Wind Damage

**Source:** Don Hamerquist and Janeen Porter, OFCO, page 150

Numerous DNR harvests, including “Mustard and Relish,” “Courtyard,” “Big Country,” “1600 Blowdown,” and “Blew Again” have resulted in collateral wind damage to mapped habitat for both northern spotted owls and marbled murrelets that is not taken into account in post-harvest stand mappings. In some instances, damage has been limited to edge impacts. In other cases, such as with “Big Country,” there are more substantial management-related habitat blowdown problems that degraded or obliterated substantial blocs of previously mapped habitat.

There also has been major wind damage to habitat associated with earlier commercial and experimental thinnings, particularly the “Rooster 30 Thin,” that contributed to major salvage operations. The harvests “1600 Blowdown,” “Blew Again,” and “Ridges Cleanup” devastated a number of important older stands in the Charley Creek headwaters area, some of which were mapped habitat and others that should have been.

**Response:** Refer to Comment 116.

## ■ Subject 15: Planning History

**No.:** 118

**Topic:** Early History

**Source:** Marcie Golde, OFCO, pages 140 and 141

In 1987, DNR chose to precede the Timber/Fish/Wildlife Resource Management Plan with an internal effort called a Block Plan for the Hoh-Clearwater block with a citizen advisory committee. Perhaps if this thoughtful report, completed in May 1988, had been fully and faithfully implemented, many years of fighting and many lawsuits could have been avoided. We are all still trying to complete the management plan for the OESF.

**Response:** Thank you for your comment. Publication of the RDEIS and draft OESF forest land plan is a major milestone in the management of the OESF. DNR appreciates the diligence of those whose involvement has spanned many years.

## ■ Subject 16: Planning Milestone

**No.:** 119

**Topic:** Recognition

**Source:** William Fleck, City of Forks, pages 1, 2, and 4

DNR and its staff deserve to be commended for bringing forth both an RDEIS and draft forest land plan for the OESF. The fact that the forest land plan has been produced is a significant milestone not only in the OESF, but also within the framework of DNR’s HCP and the history of DNR itself. The Commissioner and his staff deserve to be commended for making this occur in spite of the tremendous level of challenges that they have had to overcome.

The DNR notes its staff, past and present, who were instrumental in the development of this OESF plan in the past. In addition to those individuals, the City believes that there are non-DNR individuals either within the beneficiary and/or timber community, or individuals that the City obtained guidance and information from over the many years, that also deserve to be recognized and/or remembered at this historic junction: John Calhoun, Phil Kitchel, Bob Dick, Will Hamilton, Ann Forest Burns, Nedra Reed, Phil Arbeiter, Bryon Monohon, Bert Paul, Harry Bell, Carol Johnson, Jason Cross, Jeff Connick, Bruce Bare, Bruce Lippke, Sen. Jim Hargrove, Rep. Lynn Kessler (ret.), Diana Reaume, Frank Walter, John Jones, Bruce Thomas, Camille Scott, Joshua Gilmore, Brenda Hood, Heath Heikkla, Gordon Gibbs (DNR), Anastasia Fleck, William Fleck, Howard Thronson (DNR), and Jack Hulsey (DNR).

DNR does correctly explain that the OESF forest land plan and its RDEIS are required by the HCP. While other documents are referenced that required this effort, the information provided does not reflect that at times, under previous administrations, significant involvement, cajoling, at times litigating, and politicking was required to bring about this forest land plan. These unsung efforts were at times done by members of the beneficiary community, predominately the City of Forks, the Quillayute Valley School District, and the Forks Community Hospital, as well as members of the timber community to include the North Olympic Timber Action Committee and the American Forest Resource Council. In addition, similar efforts were undertaken by various individuals and organizations within the environmental community. It is the City’s position that had the diligence and persistence of these individuals and organizations not wavered in the past 17 years, the forest land plan and its RDEIS may never have occurred.

**Response:** DNR agrees and sincerely thanks everyone who has contributed to this effort over the years. A forest land plan of this complexity requires a team effort across many disciplines, ideologies, and jurisdictions.

## ■ Subject 17: Readability

**No.:** 120

**Topic:** Streamlining RDEIS

**Source:** Tom Partin, AFRC, page 7

We want to compliment staff on many improvements in the RDEIS as compared to the DEIS for the forest land plan. Its format is much easier to follow and its graphics much more clearly convey the expected impact of the proposed alternative, and how, if at all, those impacts differ from the No Action Alternative.

However, the heavy reliance on appendices, coupled with poorly designed and/or explained graphs and charts, makes portions of the document difficult to follow or understand. We urge streamlining and simplification in the FEIS.

**Response:** One of DNR’s objectives for the RDEIS was to improve readability. One way to improve readability is to explain technical and scientific concepts as simply as possible in the main document, and move in-depth discussion of these concepts to appendices for readers interested in understanding a topic in greater detail. For the FEIS, DNR clarified sections of the document per comments received.

**No.:** 121

**Topic:** Clarification of Charts

**Source:** Tom Partin, AFRC, page 7; David Bell, WDFW, page 4

In Tables E-11 and E-12 in Appendix E, no explanation is given as to why the No Action and Landscape Alternative number of acres were summed for each number of entries. While it is understandable why DNR would like to compare the two alternatives in these tables, it does not make sense to sum the values for each watershed.

On Chart K1 in Appendix K, values on the y-axis need further explanation about what they represent. This chart seems counter-intuitive and shows increasing edge-to-area ratio over the entire OESF, while each of the landscapes in general show decreasing edge-to-area ratios, which we would support. We suggest clarification or a better explanation.

On charts K-2 to K-15, the captions only indicate forest (generic); is this correct? If the intent is to characterize Old Forest Habitat, we suggest it be clarified, as it is confusing with the subsequent charts.

**Response:** In Tables E-11 and E-12 in Appendix E, the number of acres were summed in error. This mistake has been corrected for the FEIS.

The captions for Charts K-1 through K-15 in Appendix K should read “interior older forest,” not “interior forest.” DNR has corrected these captions for the FEIS. Interior older forest is defined as forest stands that are in the Biomass Accumulation or Structurally Complex stand development stages and are at least 328 feet away from a high contrast edge, such as an ecosystem initiation stand, paved road, water body, rock

pit, or opening created by natural disturbance such as fire or windthrow. Refer to pages 3-189 through 3-191 of the RDEIS for more information.

The y-axis on Chart K1 shows the edge-to-area ratio for patches of interior older forest. The edge-to-area ratio is a relative metric that compares the length of the edge to the area of either a shape or a collection of shapes. Many, smaller patches would have a higher edge-to-area ratio than a single large patch.

DNR has corrected charts K5 through K15 in Appendix K. Over time, under the No Action and Landscape Alternatives the edge-to-area ratio increases or stays roughly the same in the majority of landscapes. When all landscapes are considered together, the trend is an increase in these ratios over time across the OESF. Refer to page 3-190 of the RDEIS for more information on edge-to-area ratios and pages 3-198 through 3-199 for analysis results.

**No.:** 122

**Topic:** Improvements in Readability

**Source:** William Fleck, City of Forks, page 1 and 2

The DNR staff who developed these documents deserve to be commended for ensuring that the forest land plan and much of the RDEIS is presented in a very readable and educational manner. While there is an excessive reliance on appendices that are both complex and very technical in nature, the forest land plan and its associated RDEIS are written in a straight-forward and readable way, helping to ensure a common usage of language and information. One of the quickest examples of this approach is found on page ES-5 of the RDEIS, where DNR's planning process is clearly explained and represented. The document does this repeatedly throughout its many, many pages and in doing so provides a much clearer understanding of the efforts undertaken by DNR.

**Response:** Thank you for your comment. DNR has made further clarifications in the FEIS and draft OESF forest land plan and hopes these improvements help readers navigate and understand these documents.

## ■ Subject 18: Research, Monitoring, and Adaptive Management

*No.:* 123

*Topic:* **Premature to Implement Adaptive Management: Marbled Murrelets**

*Source:* **Derek Poon, OFCO, pages 54 through 63**

I judged adaptive management effectiveness based on a nine-question analysis called a “Problem-Scoping Key for Adaptive Management” from the 2009 Department of the Interior Technical Guide (Williams et al., 2009) to evaluate whether adaptive management is appropriate for the OESF. I assessed whether answers to the nine questions in the checklist key are positive or negative, and whether specific, measurable, achievable, results-oriented, and time-fixed (SMART) objectives from the same Department of the Interior sources are used. For an Endangered Species Act-listed species, marbled murrelets, I then concluded whether adaptive management is appropriate for the OESF.

Question 9 of the nine-question analysis asks if the process fits within the appropriate legal framework, a question not part of DNR’s five-consideration method. The answer to this question is no, because DNR has not completed the Marbled Murrelet LTCS, which is the missing roadmap to marbled murrelet long-term recovery in the marbled murrelet recovery plan. In addition, without the Marbled Murrelet LTCS, the answer to question 3 regarding site-specific, measurable objectives (which also qualify as SMART objectives) is also no.

Arguably, explicit management objectives could be stated without the Marbled Murrelet LTCS because specific OESF habitat characteristics in the OESF interim strategy are the management objectives. However, this is not possible due to the high degree of specificity required for management objectives.

Adaptive management objectives should satisfy the legal requirements for a species to recover, not contribute to recovery or just survive. This means that recovery plan principals, which specify recovery, and not HCP requirements alone must guide planning and implementation. I realize that implementation of recovery plans is voluntary, and that the HCP may or may not equate to species recovery or delisting because recovery is not required for an HCP. HCPs are only required to “make a contribution” to recovery. Yet recovery plans are required for each listed species, so at a minimum, species recovery must be articulated, even if implementation is politically affected.

Recovery plan specifications will be the most difficult to meet without a Marbled Murrelet LTCS because recovery plans must incorporate “site specific management actions necessary to achieve recovery of the species” and “objective, measurable criteria which, when met, would result in a determination that the species be removed from the list.” These questions are directed at recovery or delisting, which go beyond HCP-required minimization and mitigation. I believe these considerations may extend to areas both within and outside the OESF, and that unique, site-specific management prescriptions may be needed that incorporate the concept of “not everything everywhere all the time,” as well as incentives of money, regulatory flexibility, and recognition to identify timber harvests that are consistent with recovery. However, the OESF’s unzoned

approach could make this difficult. Any difference between the HCP’s “contribution” and actual recovery and delisting is probably reconcilable, but this difference cannot be determined without a completed Marbled Murrelet LTCS.

In conclusion, existing OESF information will not meet recovery plan, HCP, or SMART specifications without the marbled murrelet LTCS. Therefore, adaptive management is premature.

**Response:** Section 24.5 of the Implementation Agreement (Appendix B to the HCP) requires adaptive management on state trust lands covered under the HCP.

DNR believes it is reasonable to proceed with adaptive management in the OESF prior to development of the Marbled Murrelet LTCS. DNR has well-defined management objectives and strategies for implementing the northern spotted owl and riparian conservation strategies. Management activities described in the forest land plan can be monitored and the results can be used to evaluate the compliance and effectiveness of those activities. Both the RDEIS and the forest land plan identify key uncertainties (knowledge gaps) to be reduced through research and monitoring, and the forest land plan outlines priority research and monitoring projects in the near-term. The adaptive management process itself is well-developed, with a step-by-step procedure and defined roles and responsibilities for key team members. Therefore, DNR has enough information and the organizational structure it needs to start implementing formal adaptive management on priority topics. When the marbled murrelet LTCS is approved, its elements will be considered for adaptive management following an already established process.

**No.:** 124

**Topic:** Premature to Implement Adaptive Management: Other Listed Species

**Source:** Derek Poon, OFCO, pages 54 through 63

After determining that adaptive management is premature for marbled murrelets, I extrapolated that answer to other listed species with less analysis to determine if adaptive management is an appropriate choice for the OESF.

It is possible but highly unlikely that adaptive management could be judged an appropriate choice for other listed species given the obvious and still unreconciled differences in interpretation of HCP-required minimization and mitigation, as well as required protocols and data updates. For example, just a simple analysis of riparian protection afforded to listed species by different stream types could have diverse interpretations that are magnitudes, not small percentages, different. Such a result is cause for a formal HCP amendment. These differences confound or compromise any attempts to interpret the effectiveness of management actions. Accordingly, the bottom line is that adaptive management in the OESF is premature.

**Response:** Section 24.5 of the Implementation Agreement (Appendix B to the HCP) requires adaptive management on state trust lands covered under the HCP. The Federal Services consider adaptive management a tool to address uncertainty in the conservation of species covered by HCPs (refer to the *Habitat Conservation Planning Handbook*

[USFWS and National Marine Fisheries Service {NMFS} 1996 and its addendum [USFWS and NMFS 2000]].

Adaptive management, as described in Chapter 4 of the draft OESF forest land plan (Appendix A to the RDEIS), will focus on uncertainties (knowledge gaps) ranging from spatial configuration of habitat capable of supporting northern spotted owls to ecological relationships between riparian and upland areas (refer to Table A-46 on p. 150).

Although “differences in interpretation of HCP-required minimization and mitigation” do exist, such differences are a small proportion of the uncertainties considered by DNR and do not render the entire adaptive management process premature. In fact, acquiring scientific knowledge in an adaptive management framework is a good way to resolve these differences.

**No.:** 125

**Topic:** Adaptive Management and Conflicting Management Objectives

**Source:** Derek Poon, OFCO, pages 53 and 63

Adaptive management helps to achieve the OESF goals of environmental protection, indicated by a path to recovery and delisting of Endangered Species Act-listed species; and fiscal accountability, indicated by timber harvest to help fund schools. The major adaptive management question is whether these goals are co-equals as purported by conservationists, or whether fiscal responsibility is a higher priority, as asserted by DNR through policies, actions, and litigation history. OFCO believes these goals are co-equal. DNR, by its funding priorities, harvest decisions, and litigation history, implicitly considers fiscal responsibility a higher priority than environmental protection. Without resolution of these priorities, adaptive management is confounded.

Pragmatically, economics are important to industry and to help fund county schools. But as a legal matter, unless the Endangered Species Act Committee explicitly rules that economics trump species recovery, DNR must abide by the law to recover listed species in the OESF. This means the Conservationists’ co-equal goals of environmental protection and fiduciary responsibilities are more legally defensible than DNR’s preference for fiduciary responsibility over environmental protection. This view is further booster by the legal requirement for effective adaptive management in the HCP, and backed up by specific Department of the Interior adaptive management guidelines.

**Response:** Recovery plans are prepared by USFWS and are completely separate from HCPs. Although recovery plans provide guidance on how to bring about recovery and how to evaluate when recovery has been achieved, they are not regulatory documents, and do not require DNR to achieve delisting of species on state trust lands. DNR meets the obligations of the Endangered Species Act by implementing its HCP.

The Washington State Legislature designated DNR as the manager of state trust lands and directed it to manage these lands to produce perpetual income for the trust beneficiaries. In 1984, the Washington State Supreme Court addressed the state trust relationship in *County of Skamania v. State*, 102 Wn.2d 127, 685 P.2d 576 (1984). The Court found that a trustee must act with undivided loyalty to the trust beneficiaries to the

exclusion of all other interests and must manage trust assets prudently (DNR 2006a p. 15). Refer to Comment 12 for more information on DNR’s trust management responsibilities.

Prudent management of state trust lands means more than ensuring a supply of timber for current and future trust beneficiaries. It means finding the right balance between revenue production and ecological values, including habitat for listed species, to keep the forest ecosystem healthy and productive.

In the OESF, DNR seeks to achieve this balance through an integrated management approach. As stated in the HCP: “The long-term vision for the OESF is of a commercial forest in which ecological health is maintained through innovative integration of forest production activities and conservation” (DNR 1997, p. I.14). DNR’s overall goal for the research and monitoring program and adaptive management process is to provide scientific information to continually improve the integration of revenue production and ecological values by learning from the outcomes of operational and experimental approaches (DNR 2013a, p. 48).

**No.:** 126

**Topic:** Socio-economic Influences

**Source:** Derek Poon, OFCO, page 56

To their credit, DNR acknowledged that socio-economics will affect science findings in adaptive management decision making.

**Response:** DNR did not mean to imply that science findings from DNR’s science-informed adaptive management process will be affected by socio-economics. Instead, DNR meant that managers will consider scientific findings, and make final decisions on management changes in a broader context that includes science as well as other factors. As stated on page 157 of the draft OESF forest land plan (Appendix A to the RDEIS), “Recommendations....will be based on the findings from Step 5 [of the adaptive management process] but will also consider the economic and social consequences and operational feasibility of potential changes.”

Although DNR expects to focus primarily on ecological concerns, it is possible that socio-economic factors may be investigated formally as part of the research and monitoring program and adaptive management process. Refer to Comment 128 for more information.

**No.:** 127

**Topic:** Other Management Approaches

**Source:** Derek Poon, OFCO, page 55

I found it very commendable that the DNR RDEIS acknowledged that while adaptive management is the preferred method, forest management must also use the precautionary and trial and error approaches; this is particularly realistic when long-term strategies either do not exist or are judged with explicit or implicit diverse goals.

**Response:** Adaptive management, the precautionary approach, and the trial and error approach are the three general approaches to managing in the face of uncertainty. In Chapter 4 of the draft OESF forest land plan (Appendix A to the RDEIS), DNR described each approach, but stated its preference for implementing adaptive management over the other two approaches in the future.

**No.:** 128

**Topic:** Adaptive Management Indicators

**Source:** Derek Poon, OFCO, page 57; AFRC, page 10

AFRC points out that most all of the concepts around research are looking at habitat and ecologic outcomes and not the economic results. Are there any thoughts on looking into the commercial goals of the OESF beyond the traditional variable retention harvest/variable density thinning harvests and avoiding expensive road locations?

OFCO suggests that fiduciary responsibility could be an adaptive indicator as timber harvests are indices of economic health of timber counties, although harvests may or may not be consistent with listed species recovery.

**Response:** The research and monitoring program and adaptive management process will focus on reducing key uncertainties (knowledge gaps) and thus increasing DNR’s confidence in ongoing management practices or on testing alternative management practices. Because the majority of the uncertainties identified during the development of the forest land plan are ecological (refer to Table A-46 on p. 150 of the draft OESF forest land plan [Appendix A to the RDEIS]), the focus of the research and monitoring process as described in the draft OESF forest land plan (Appendix A to the RDEIS) also is ecological. DNR may include studies focused on economic and social uncertainties in the future. One example of a study focused on economic uncertainties is a recent effort to develop a forest estate model that incorporates road costs into harvest scheduling decisions. The study is being conducted by the University of Washington in cooperation with DNR, using the Clearwater landscape as the study area.

**No.:** 129

**Topic:** Assistance with Adaptive Management Process

**Source:** Derek Poon, OFCO, page 53

OFCO will work with DNR to effectuate adaptive management and help DNR reach its goals of environmental protection and fiscal accountability as much as practicable by (A) finding and applying incentives of money, regulatory flexibility, and recognition to supplement regulations; (B) applying the ESA recovery principle of “not everything everywhere all the time” to identify timber harvests consistent with Endangered Species Act-listed species recovery; (C) completing certain data or protocol reconciliation and HCP marbled murrelet documents necessary for adaptive management and HCP efficacy; and (D) completing a marbled murrelet recovery plan (USFWS 1997) that currently relies on an incomplete marbled murrelet HCP (DNR 1997) with the marbled murrelet interim strategy. The incomplete information in (C) consists of the Marbled Murrelet LTCS, currently missing from the marbled murrelet recovery plan and HCP, and updated or new HCP “minimization and mitigation” for all Endangered Species Act-listed species.

**Response:** DNR expects to provide opportunities for public involvement in the OESF adaptive management process. The marbled murrelet LTCS, once completed and approved, will be an amendment to the HCP but will not become part of the federal Marbled Murrelet Recovery Plan, which was published by USFWS in 1997. The federal Marbled Murrelet Recovery Plan is completely separate from the HCP.

**No.:** 130

**Topic:** Failure to Implement Research, Monitoring, and Adaptive Management

**Source:** Don Hamerquist and Janeen Porter, OFCO, pages 146, 151, 152, and 153; Colman Byrnes, page 1

The experimental role projected for the OESF has not been implemented, and this draft provides no plausible path to implement it in the future. DNR has not committed to, much less developed, a systematic adaptive management regime in the OESF, and there is no serious program of research in the OESF. If any experimental work has been conducted, the results are not systematized and publicly available and we have no idea what, if any, management changes resulted. We have repeatedly asked for such information—as recently as the past month—and it is never produced.

For example, the bridge removal and road decommissioning project on the 1800 road failed in the middle of the last decade, delivering sediment to the upper Clallam River and raising dangers of a catastrophic failure that, according to DNR geologists, could activate massive deep-seated historic landslides. An inadequate “temporary fix” is still in place, but there has been no systematic review of the mistakes that resulted in the failure or plans for a long-term solution. In addition, there have been three large debris flow landslides that have breached major active sections of the road grid (P1000 and P1700) and delivered substantial sediment to the Clallam and Little Hoko stream network. All of these were initiated from faulty construction on mid-slope roads. Numerous segments of Type 4 buffers associated with the “Courtyard,” “1600 Blow,” and “P1400” harvests, as well as a number of earlier harvests, have been almost completely blown down and cannot be functioning properly. Headwaters initiation wetlands in the “Blowder Ridge” forest practices application were logged and some wetlands in the “Clallam Combined” and the “Stumpy’s Ride” harvests will be logged. Finally, the impact of DNR’s management actions has been a substantial reduction in functional northern spotted owl and murrelet habitat. There is nothing in this document to reverse this trend or even address it as a problem. Each of these situations should have triggered research and monitoring, and there should be some record of an adaptive management response to improve management practices. What is it? We regard this as a clear breach of DNR’s adaptive management obligations.

In addition, there is no plan of research and monitoring that will consider the validity of the assumptions and hypotheses on which DNR’s policies are supposed to rest. Nor has DNR provided the funding to begin the monitoring of changes in baseline environmental conditions that are essential for experimental work in the OESF. Monitoring of trends in basic water quality parameters is still in the planning stages; this effort is underfunded and the study design is inadequate. Although there has been some silvicultural experimentation, very little research has focused on the environmental impacts of management actions. DNR conducts some minimal rules compliance monitoring on its own operation, but there is no program of effectiveness

monitoring that facilitates a systematic evaluation of the effects of management actions in achieving overall ecological goals. Further, DNR has acknowledged that it will be decades before monitoring might begin to produce results that could be linked to specific causes and result in specific management changes.

**Response:** As part of this forest land planning effort, DNR has further developed its research and monitoring program and adaptive management process. Both are described in Chapter 4 of the draft OESF forest land plan (Appendix A to the RDEIS).

DNR also has identified priority research and monitoring activities for the near-term (next five years). These activities are either underway or in the planning stage. Some of these activities are designed as observational studies while others are organized as experiments to assess the effectiveness of specific silvicultural techniques. The current status of these projects is available on DNR's website at <http://www.dnr.wa.gov/programs-and-services/forest-resources/olympic-experimental-state-forest>. Refer to page 162 of the draft OESF forest land plan for more information.

**No.:** 131

**Topic:** Experimentation

**Source:** Colman Byrnes, page 1

This is supposed to be an experimental forest. Is there any experimentation in these plans? Or is it just an excuse to circumvent the rules in order to maximize the cut? This plan is very short on monitoring and so can contribute nothing to adaptive management.

**Response:** Chapter 4 of the draft OESF forest land plan (Appendix A to the RDEIS) includes a section on priority research and monitoring activities in the near-term (next five years). This section lists several monitoring and research activities in the OESF which are either underway or in the planning stage. The current status of these projects is available on DNR's website at <http://www.dnr.wa.gov/programs-and-services/forest-resources/olympic-experimental-state-forest>.

**No.:** 132

**Topic:** Biodiversity

**Source:** Jill Silver, OFCO, pages 142 and 143

The HCP makes a number of references to biodiversity, for example species diversity, diversity of stand features, importance of downed wood, and the multiple species intended to be supported within these forests. Managed forest stands in the OESF have been biologically and structurally simplified from decades of harvest, salvage, slash burning, and mass wasting. Maintaining or restoring biodiversity in industrial forestlands likely requires managers to develop a working definition of biodiversity, identify benchmarks specific to the OESF, incorporate the full suite of species represented in the different ecotones present in the OESF into stand inventories, and measure and monitor the presence and recovery of these species and structures in the forest units or stands.

**Response:** The development of the draft OESF forest land plan was guided by policies such as the HCP and the *Policy for Sustainable Forests*, both of which include

provisions and language about biodiversity. Policies in the *Policy for Sustainable Forests* that emphasize biodiversity include “Forest Ecosystem Health and Productivity” (p. 31), “Old Growth Stands in Western Washington” (p. 33), and “Wildlife Habitat” (p. 35).

The RDEIS defines biological diversity as “The full range of life in all its forms” (p. ES-3). The RDEIS lists biological diversity, together with ecosystem resilience and long-term ecosystem productivity, as one of the ecological values that DNR seeks to provide in the OESF.

The monitoring approach taken by DNR, which is in line with the monitoring programs of other organizations managing large landscapes, is to monitor indicator species, such as salmonids; key habitat attributes, such as large wood in streams; and landscape characteristics, such as the percentage of each landscape that is northern spotted owl habitat.

The draft OESF forest land plan (Appendix A to the RDEIS) lists priority research and monitoring projects for the near-term (next five years); these projects use habitat and biological indicators to characterize past and current conditions and the rate of recovery of ecological values including biodiversity.

**No.:** 133

**Topic:** Biodiversity

**Source:** Jill Silver, OFCO, page 142

Five significant opportunities could present themselves if DNR follows the full definition of biodiversity, which includes genetic, species, ecosystem, and landscape diversity. DNR will be truly managing the OESF for the benefit of our children and grandchildren, and for multiple species thriving at all levels of diversity; DNR will produce a predictable flow of value-added timber as well as healthy, bio-diverse ecosystems, which support all four levels of diversity; DNR can show the world that conservation and commodity production are both possible at the same time, in the same forest, although neither can be pursued to maximum levels without being mutually exclusive; DNR will gain certainty that responses to silvicultural treatments are resulting in desired outcomes; and DNR will provide additional ecosystem services, which, if valued in an economic context, could also provide DNR with additional benefit, credit and income for beneficiaries.

**Response:** The RDEIS defines biological diversity as “The full range of life in all its forms” (p. ES-3). The RDEIS lists biological diversity, together with ecosystem resilience and long-term ecosystem productivity, as one of the ecological values that DNR seeks to provide in the OESF.

DNR’s mission for the OESF is to intentionally learn how to integrate revenue production and ecological values across as much of state trust lands as possible to meet DNR’s vision for forest management. DNR’s vision for forest management in the OESF as well as all other DNR planning units is a productive, healthy, biologically diverse working forest that provides a perpetual supply of revenue to trust beneficiaries as well

as ecological values, including habitat for native species. DNR will achieve this vision in the OESF through the integrated management approach, which includes research and monitoring and adaptive management. Refer to page 18 of the draft OESF forest land plan (Appendix A to the RDEIS) for a description of integrated management.

**No.:** 134

**Topic:** Benchmarks

**Source:** Jill Silver, OFCO, pages 142 and 144

Implementing an experimental combination of conservation and production utilizing adaptive management is not possible without data of sufficient statistical power to establish causative links between timber extraction and impacts on all species and habitats of interest, not just "age class" or other silvicultural benchmarks. The current stand inventories used by DNR (forest resource inventory system) use only silvicultural parameters specific to tree structure, are inadequate and incomplete, and do not support an evaluation of stand condition or recovery in terms of biodiversity or function. Benchmarks must be refined through baseline inventory of representative sample sites for the biodiversity present in specific types or individual forest stands, watersheds, or sub-basins. To accomplish this, it will be necessary to determine the density, range, or population and characteristics of different soils, fungi, plant, and animal species in reference stands of intact old forests. From these inventories, desired future condition metrics can be developed to modify the working benchmarks as necessary to evaluate the community or individual species responses to silvicultural or restoration treatments.

One challenge will be the lack of inventories for most species that exist on the OESF landscape. However, both Olympic National Forest and Olympic National Park have multi-species inventories which can be used. One source of economically and biologically useful research comes from recent work conducted in the Pacific Northwest, reported in the article "Green Tree Retention in Harvest Units—Boon or Bust for Biodiversity?" (PNW Science Findings, Issue 96, 9/07). This study, part of the larger USFS DEMO research program, indicates that the benefits to biodiversity are higher in unharvested patches of 2.5 acres than in dispersed harvest (in other words, thinning), although for some species (for example, northern flying squirrels), access to food sources was improved with dispersed harvest. Begun in 1992 and ongoing, this research was conducted as a large scale, multi-year, interdisciplinary project to examine the effects of various green tree retention strategies on multiple forest types. It was peer reviewed, and the resulting design process was intensive, incorporating many changes. The high degree of rigor incorporated in this project provides an important model; the results inform management strategies in ways that modeled prescriptions based on limited inputs applied at a landscape scale would not. This on-going study is an excellent example of research and monitoring in the OESF.

(<http://www.cfr.washington.edu/research.demo/>)

**Response:** The HCP requires DNR to conduct validation monitoring on the major conservation strategies (northern spotted owl, marbled murrelet, riparian). Validation monitoring is used to evaluate cause-and-effect relationships between habitat conditions resulting from implementation of conservation strategies and the populations these strategies are intended to benefit.

A conceptual framework for implementing riparian validation monitoring was provided in Appendix A-5 to the draft OESF forest land plan (Appendix A to the RDEIS). A riparian validation study (in progress) will assess the population response of salmonids to managed landscapes in the OESF.

The low number of northern spotted owls on the Olympic Peninsula (refer to annual reports of the Northwest Forest Plan Interagency Regional Monitoring program [<http://www.reo.gov/monitoring/reports/northern-spotted-owl-reports-publications.shtml>]) makes it difficult or impossible for any agency, including DNR, to implement a statistically valid cause-and-effect study with sufficient replication to evaluate species response. However, DNR will continue to evaluate alternative ways to test these assumptions.

Marbled murrelet validation monitoring will be considered after the marbled murrelet LTCS is approved.

**No.:** 135

**Topic:** Research and Monitoring Recommendations

**Source:** Jill Silver, OFCO, pages 144, 145

All harvest must be linked to research and monitoring. Roads and road impacts must be incorporated into the research platform. DNR must define how many thinning entries may be made under each rotation. DNR must record and report the actual rotation lengths as opposed to the modeled lengths.

**Response:** Silvicultural activities (including harvest) and road management activities in the OESF (and other HCP planning units) are reported to the Federal Services in annual reports (<http://www.dnr.wa.gov/programs-and-services/forest-resources/habitat-conservation/monitoring-and-reporting>).

DNR conducts implementation monitoring on selected HCP conservation strategies to determine whether the strategies are implemented as written. Monitored activities include timber harvest and road management. Results are reported to the Federal Services annually (<http://www.dnr.wa.gov/programs-and-services/forest-resources/habitat-conservation/monitoring-and-reporting>).

DNR began status and trends monitoring of riparian and aquatic habitat in the OESF in 2012. In this study, DNR selected 50 Type 3 watersheds that were representative of the OESF, so that the monitoring results could be extrapolated across state trust lands in the OESF. At the outlet of each of these watersheds, DNR samples stream reaches for specific riparian and aquatic indicators (for example, shade and large wood). Data collected at the reach level for each riparian and aquatic indicator will be correlated with data on basin conditions and management disturbances (such as harvest and road management) at the watershed level to infer management effects.

In the OESF, DNR will use the tactical model to develop an optimal solution of when, where, and by what method to harvest forest stands produce revenue and meet ecological objectives. Part of that optimal solution should be rotation length and number

of thinning entries for forest stands in operable areas. This solution will be expressed as a harvest schedule. DNR will use the harvest schedule as a starting point for determining when, where, and by what method to harvest, but final decisions will always be based on field-verified conditions. Information gathered in the field as part of timber sale planning will be used to update the tactical model.

**No.: 136**

**Topic: Validation of Northern Spotted Owl Habitat Mapping and Modeling Assumptions**

**Source: Chris Mendoza, Mendoza Environmental, LLC, page 9**

The introduction of snags and down woody debris as a variable driving forest estate model outputs on potential northern spotted owl territories brings with it assumptions about how stand composition and structure will change over time. Since prior estimates of northern spotted owl habitat did not account for such stand attributes that meet habitat requirements, DNR's new estimates based on the forest estate model reflect changes to the amount and location (landscape) of potential northern spotted owl territories that may develop over the next 100 years (RDEIS, pages 3-212 and 3-213). DNR should develop a monitoring plan to help validate model assumptions over the life of the HCP to decrease model error and therefore risk to listed species.

**Response:** DNR has developed a new forest inventory system based on LiDAR and PHODAR data and sample plots. This system, called the "Remote Sensing Forest Resource Inventory System" (RS-FRIS), will replace DNR's existing inventory system and be used as input data for the tactical model. DNR is investigating ways to use RS-FRIS to better characterize older forest stand conditions. Also, for the tactical model DNR will use an updated forest vegetation simulator (FVS) tree mortality model.

Additional information may be gathered from field sampling as part of other ongoing and planned monitoring projects. For example, the project "Status and Trends Monitoring of Riparian and Aquatic Habitat in the OESF" includes tree sampling in one hundred, 30 by 60 meter plots in riparian forests across the OESF.

**No.: 137**

**Topic: Northern Spotted Owl Habitat Mapping and Modeling**

**Source: Chris Mendoza, Mendoza Environmental, LLC, page 10**

Develop a long-term monitoring plan to conduct routine sampling (5-10 years) of forest inventory units within short-term harvest management units to validate forest estate model projections. Develop specific monitoring projects that document and follow "pathways" to older forest stand conditions via routine sampling methods (for example, LiDAR combined with field sampling) to decrease the risk of model error, particularly for long-term model projections of Old Forest Habitat.

**Response:** Refer to Comment 136.

**No.:** 138

**Topic:** Northern Spotted Owl Use of Stands Created by Active Management

**Source:** Dave Werntz, OFCO (and Conservation Northwest), page 116

The forest 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 RDEIS to support the notion that owls will use stands managed in the manner proposed in the forest land plan. There is no proposal to test or verify that owls will use stands created by active management for dispersal, foraging, roosting, or nesting purposes. Similarly, there is no proposal to test or verify that landscapes will support occupancy by successfully reproducing northern spotted owls.

**Response:** Few published studies document the response of northern spotted owls to management treatments designed to create structurally complex habitat. Where habitat treatments have been conducted in the past one to two decades (for example, the Olympic Habitat Development Study led by USFS [Harrington and others 2005], the Density Management Study led by the Bureau of Land Management [Cissel and others 2006], and DNR’s own monitoring studies), not enough time has passed post-treatment for the intended habitat structure to develop, particularly for well-developed mid-stories and vertical canopy continuity. A few studies have documented at least some capacity, under certain conditions, for northern spotted owls to use managed forests that have been thinned (Glenn and others 2004, Irwin and others 2015), but those studies primarily were from California and Oregon and may or may not have applicability to Washington. Most of the literature on thinning and spotted owls has focused on immediate impacts on resident owls from the operation itself, with the studied harvests generally not intended to develop future owl habitat (USFWS 2011 and references therein).

The low number of northern spotted owls on the Olympic Peninsula (refer to annual reports of the Northwest Forest Plan Interagency Regional Monitoring program [<http://www.reo.gov/monitoring/reports/northern-spotted-owl-reports-publications.shtml>]) makes it difficult or impossible for any agency, including DNR, to implement a statistically valid cause-and-effect study with sufficient replication to evaluate species response. However, DNR will continue to evaluate alternative ways to test these assumptions.

In the draft OESF forest land plan, DNR identified key uncertainties (knowledge gaps) to be reduced through research and monitoring. These uncertainties include the effectiveness of silviculture to restore and maintain habitat for northern spotted owls, and the spatial configuration of habitat capable of supporting northern spotted owls in managed landscapes (refer to Table A-46, p. 150 in the draft OESF forest land plan [Appendix A to the RDEIS]). All uncertainties are prioritized for research and monitoring per the criteria in Text Box A-12 on page 148 of the draft OESF forest land plan.

**No.:** 139

**Topic:** Adaptive Management to Increase Amount of Northern Spotted Owl Habitat

**Source:** Gary Bell, WDFW, page 4

Regarding forest management and northern spotted owls, we agree that forest management designed to expedite development of structurally complex forest conditions has the potential to increase functional northern spotted owl habitat across the OESF. We support DNR’s proposal to employ variable density thinning and variable retention harvest treatments as a means to accelerate the rate of understory development and structurally complex stand types within mature forests. It seems likely that incorporating such harvest strategies will diversify stand structure more quickly than would forest stands left to develop under natural conditions. Applying these harvest strategies will provide important habitat for a suite of wildlife species on a shorter time scale, particularly for those associated with snags and other structures that are generally limited within intensively managed (even-aged harvest) landscapes.

Results of the modeling for the four northern spotted owl indicators (movement, nesting, roosting and foraging) as they relate to life history requirements and forest management, appear to provide nominal gains in northern spotted owl habitat over the duration of the planning period (as does the No Action Alternative); the overall difference between the two alternatives is negligible.

However, the projected increase in acres of northern spotted owl habitat under the Landscape Alternative would likely lend itself to more opportunities for adaptive management that may increase northern spotted owl habitat in the OESF sooner than predicted by the modeling.

**Response:** The effectiveness of silviculture to restore and maintain habitat for northern spotted owls was identified as a key uncertainty (knowledge gap) in the draft OESF forest land plan (refer to Table A-46, p. 150 in the draft OESF forest land plan [Appendix A to the RDEIS]). All uncertainties are prioritized for research and monitoring according to the criteria in Text Box A-12 on page 148 of the draft OESF forest land plan.

DNR started two projects in 2014 to assess the effects of silvicultural practices at the stand level. In the first project, “The Influence of Repeated Alternative Biodiversity Thinning Treatments on Coastal Forests,” DNR is quantifying the effects of alternative pre-commercial thinning treatments and subsequent thinning on stand complexity and growth. In the second project, “Mind the Gap: Developing Ecologically Based Guidelines for Creating Gaps in Forest Thinning on the Olympic Peninsula” DNR is assessing the effects of silvicultural practices, specifically variable density thinning and canopy gap treatments, at the stand level. In this study, DNR is evaluating vegetation and stand structure responses in and around management-created gaps, and the degree to which those gaps can be made to emulate those found in natural old-growth forests. More information on these projects is available on DNR’s website at [http://www.dnr.wa.gov/ResearchScience/Topics/TrustLandsHCP/Pages/lm\\_hcp\\_oesf\\_research\\_interest.aspx](http://www.dnr.wa.gov/ResearchScience/Topics/TrustLandsHCP/Pages/lm_hcp_oesf_research_interest.aspx).

**No.: 140**

**Topic: Monitoring and Validation of Old Forest Habitat Patches**

**Source: Gary Bell, WDFW, page 4 to 5**

As part of monitoring and validation, we envision that DNR would track blocks of current and future Old Forest Habitat through time to assess the likelihood that those patches remain functional and viable through the life of the HCP, as is planned on some other HCP planning units.

We agree that monitoring forest stands that receive early treatments (variable retention harvest or variable density thinning) to track development into Old Forest Habitat conditions is a crucial aspect of the plan. This will be a critical measure of success in reaching the maintenance and enhancement phase of the strategy, in which the minimum of 20 percent Old Forest and 20 percent young sub-mature forest (40 percent overall minimum threshold) structure is attained.

**Response:** The effectiveness of silviculture to restore and maintain habitat for northern spotted owls was identified as a key uncertainty (knowledge gap) in the draft OESF forest land plan (refer to Table A-46, p. 150 in the draft OESF forest land plan [Appendix A to the RDEIS]). All uncertainties are prioritized for research and monitoring according to the criteria in Text Box A-12 on page 148 of the draft OESF forest land plan.

In 2014, DNR started a project titled “Mind the Gap: Developing Ecologically Based Guidelines for Creating Gaps in Forest Thinning on the Olympic Peninsula” to assess the effects of silvicultural practices, specifically variable density thinning and canopy gap treatments, at the stand level. In this study, DNR is evaluating vegetation and stand structure responses in and around management-created gaps, and the degree to which those gaps can be made to emulate those in natural old-growth forests. The aim is to perform repeated monitoring of these stands through time. More information on this project is available on DNR’s website at [http://www.dnr.wa.gov/ResearchScience/Topics/TrustLandsHCP/Pages/lm\\_hcp\\_oesf\\_research\\_interest.aspx](http://www.dnr.wa.gov/ResearchScience/Topics/TrustLandsHCP/Pages/lm_hcp_oesf_research_interest.aspx).

In addition, DNR has developed a new forest inventory system based on LiDAR and PHODAR data and sample plots. This system, called the “Remote Sensing Forest Resource Inventory System” (RS-FRIS), will replace DNR’s existing inventory system. DNR is investigating ways to use RS-FRIS to better characterize older forest stand conditions and track them over time.

**No.: 141**

**Topic: Field Reviews and Verification**

**Source: Dave Wertz, OFCO (and Conservation Northwest), page 114**

DNR has conducted no field reviews or field verification, so there is no way to know if and how model results correspond to physical conditions on the ground (for example, owl nesting or foraging) or northern spotted owl survival and recovery.

**Response:** DNR has developed a new forest inventory system based on LiDAR and PHODAR data and sample plots. This system, called the “Remote Sensing Forest Resource Inventory System” (RS-FRIS), will replace DNR’s existing inventory system and be used as input data for the tactical model. DNR is investigating ways to use RS-FRIS to better characterize older forest stand conditions. Also, for the tactical model DNR will use an updated forest vegetation simulator (FVS) tree mortality model.

Additional information may be gathered from field sampling as part of other ongoing and planned monitoring projects. For example, the project “Status and Trends Monitoring of Riparian and Aquatic Habitat in the OESF” includes tree sampling in one hundred, 30 by 60 meter plots in riparian forests across the OESF.

The low number of northern spotted owls on the Olympic Peninsula (refer to annual reports of the Northwest Forest Plan Interagency Regional Monitoring program [<http://www.reo.gov/monitoring/reports/northern-spotted-owl-reports-publications.shtml>]) makes it difficult or impossible for any agency, including DNR, to implement a statistically valid cause-and-effect study with sufficient replication to evaluate species response. However, DNR will continue to evaluate alternative ways to test these assumptions.

**No.: 142**

**Topic: Habitat Monitoring**

**Source: Coleman Byrnes, page 1**

The RDEIS admits that owl habitat will be reduced over the next few decades but then increase afterwards. How will this affect the northern spotted owl’s chances of long-term survival? No one knows because DNR does not plan to do on-the-ground monitoring. There are numerous studies that have determined the environmental needs of northern spotted owls. DNR has ignored them. How will DNR know if their plan is working? They will not. There is no scientific justification for this plan and the lack of monitoring will only make the problem worse.

**Response:** Refer to Comment 141.

## ■ Subject 19: Riparian

**No.:** 143

**Topic:** Analysis Methodology/Reliance on Flawed Models

**Source:** Mike Haggerty, OFCO, page 7

The analysis presented in the RDEIS is not credible. The analysis relies upon models, but models are not substitutes for real-world data and solutions, nor are they substitutes for experimentation and adaptive management. Realistic model inputs, valid model assumptions and constraints, and faith in the analysts are necessary to consider model predictions to be trustworthy and reasonable. None of these are present in the RDEIS.

**Response:** The use of computer models for ecological analysis is well established (for example, Benda and others 2007, Welty and others 2002), and is suggested in the SEPA Handbook (Ecology 2016) as a means of analyzing the probable impacts of a proposal and its alternatives. DNR respectfully submits that its analysis is both credible and consistent with published scientific literature. DNR’s riparian analysis used criteria and indicators commonly cited in the scientific literature as measures of riparian function, and the “composite watershed score” was patterned after published decision support models (Reeves and others 2004, Gallo and others 2005, Mathews 2007). DNR’s analysis methodology is fully documented in Appendix G with supporting citations from the scientific literature. Uncertainties and the means of addressing them through DNR’s research and monitoring program and adaptive management process are described in Chapter 4 of the draft OESF forest land plan (Appendix A of the RDEIS).

**No.:** 144

**Topic:** Riparian Buffers in the OESF Versus West-Side Units

**Source:** Don Hamerquist and Janeen Porter, OFCO, page 151

Buffers under the existing riparian conservation strategy for the OESF offer substantially less protection than those specified in the HCP for the other five west-side planning units. In addition, the current buffering strategy is so complicated and arbitrary that is practically impossible to conduct effective compliance monitoring.

**Response:** The existing riparian conservation strategy for the OESF is distinct from that of other HCP planning units because of the unique physical and ecological features of the western Olympic Peninsula. The need for special protective measures stems from a high potential throughout the OESF for mass wasting (landslides, debris torrents, channel-bank collapse) and tree blowdown. A principle working hypothesis of the existing riparian conservation strategy is that buffers designed to minimize mass wasting and blowdown will be sufficient to protect other key physical and biological functions of riparian systems (DNR 1997, p. IV.106). DNR’s current practice is to implement the riparian conservation strategy in accordance with this working hypothesis.

**No.: 145**

**Topic: Inadequacy of Riparian Buffers Under the No Action and Landscape Alternatives**

**Source: Chris Byrnes, WDFW, pages 1 and 2**

The proposed riparian buffer widths under both the No Action and Landscape alternatives are considerably narrower than those described in the *Management Recommendations for Washington's Priority Habitats: Riparian* (Knutson and Naef 1997). Given this discrepancy, we do not understand how the proposed buffer widths can meet DNR's conservation objective of protecting, maintaining, and restoring habitat capable of supporting viable populations of salmonids and other species dependent on instream and riparian environments. We recommend that DNR increase buffer widths to more closely reflect those identified in Knutson and Naef (1997). In addition, both alternatives propose management activities for a number of purposes within riparian buffers. We recommend that you clearly state that management activities within these buffers are intended to meet the conservation objective.

**Response:** While smaller than those described in the *Management Recommendations for Washington's Priority Habitats: Riparian*, the interior-core (riparian) buffers proposed under the No Action and Landscape alternatives are consistent with the terms of the HCP, the *Policy for Sustainable Forests*, and all applicable local, state, and federal laws.

**No.: 146**

**Topic: Reduction in Riparian Buffers Under the Landscape Alternative**

**Source: Mike Haggerty, OFCO, pages 7 and 10**

The RDEIS fails to clearly acknowledge that the Landscape Alternative involves a drastic reduction in riparian buffer protections throughout the OESF. Riparian buffers under the Landscape Alternative are much smaller than either the expected average buffer widths for Type 3 streams described in the HCP or those described within the minimization and mitigation measures of the incidental take permits issued to DNR. Such substantial differences should require an amendment to the HCP.

**Response:** The interior-core (riparian) buffer protections along Type 3 streams under the Landscape Alternative are consistent with the HCP and the minimization and mitigation measures of DNR's incidental take permit. As described in Table IV.5 on page IV.58 of the HCP, interior-core buffers along Type 3 streams are expected to measure 100 feet, on average, from the outer edge of the 100-year floodplain. As described in the PRT 812521 Biological Opinion, "... interior-core buffers on Type 3 waters ... would average 100 feet on each side" (USFWS 1998).

**No.: 147**

**Topic: Interior-core Buffer Under No Action Alternative**

**Source: Mike Haggerty, OFCO, pages 11 and 12**

The description of the riparian management zone for the No Action Alternative provided on page 2-17 of the RDEIS lacks sufficient detail to determine the extent of the interior-core buffer. I cannot tell what is being protected. The description can be interpreted to mean that only the floodplain and potentially unstable slopes are included in the interior-core buffer. This approach is

flawed. The interior-core buffer is inadequate and as a result, this approach depends on the exterior buffer to achieve a portion of the required riparian function.

**Response:** The No Action Alternative is intended to reflect DNR’s current practice of implementing the riparian conservation strategy in accordance with the principle working hypothesis that buffers designed to minimize mass wasting and blowdown will be sufficient to protect other key physical and biological functions of riparian systems (DNR 1997, p. IV.106). An interior-core buffer is applied to floodplains and potentially unstable slopes; an exterior buffer is applied to all interior-core buffers. The average width of the exterior buffer is specified in Table IV.8 on page IV.117 of the HCP (DNR 1997).

**No.:** 148

**Topic:** Current Implementation of Riparian Buffers

**Source:** Mike Haggerty, OFCO, page 11

DNR’s current method of implementing the OESF riparian conservation strategy is to only include the floodplain and potentially unstable slopes in the interior-core buffer. For many harvest units, interior-core buffers average 0 to 20 feet in width, with an exterior buffer approximately 150 feet in width along Type 1 through 3 streams. This implementation is significantly different from the HCP, which states: “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 chapter (DNR 1997, p. IV.111).”

It is unclear how DNR’s current method meets the commitments contained within the incidental take permits issued to DNR by the Federal Services. PRT 1168, issued in 1999, states: “The principal function of the riparian buffer is protection of salmonid habitat; the principal function of the wind buffer is the protection of the riparian buffer.”

As described in PRT 1168, Type 1 through 3 streams are to receive a conservatively managed buffer equal in width (measured from the 100-year floodplain) to a site potential tree height (derived from 100-year site index curves) or 100 feet, whichever is greater. This prescription should result in average riparian buffer widths of 150 to 160 feet.

The USFWS incidental take permit, amended for bull trout, describes the following minimization and mitigation measures: “All fish-bearing streams receive a conservatively managed 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 150 feet, whichever is greater. The first 25 feet is a non-harvest zone. Perennial streams without fish (Type 4) receive a 100-foot buffer.”

**Response:** DNR’s current implementation of its riparian conservation strategy is guided by the principle working hypothesis that buffers designed to minimize mass wasting and blowdown will be sufficient to protect other key physical and biological functions of riparian systems (DNR 1997, p. IV.106). An interior-core buffer is applied to floodplains and potentially unstable slopes; an exterior buffer is applied to all interior-core buffers.

DNR submits that this implementation is consistent with its incidental take permit, which was issued contingent upon DNR conducting its management activities as described in the HCP and associated Implementation Agreement. As stated in the HCP, “Widths of the interior-core buffer (Table IV.5) are given as average values because the lateral extent of riparian corridors varies locally with channel size, valley confinement, and landform characteristics. Furthermore, these widths should not be interpreted as maximum or minimum target values because site conditions might call for enlarging or reducing the buffer locally based on the extent of stable ground” (DNR 1997, p. IV.111).

Under DNR’s current implementation, interior-core buffers along streams on *stable* ground encompass the 100-year floodplain. As noted by the commenter, the interior-core buffer is narrower than the expected average buffer widths specified in Table IV.5 of the HCP at these locations. Interior-core buffers on potentially *unstable* slopes or landforms, however, are typically wider than the specification of Table IV.5. The calculation of the average width of the interior-core buffer includes streams on both stable ground and potentially unstable slopes or landforms. On average, interior-core buffers under DNR’s current implementation are consistent with Table IV.5.

Both passages cited by the commenter describing riparian buffers are specific to the five west-side planning units, excluding the OESF. Although PRT 1168 only includes riparian buffer descriptions for the five west-side planning units, both the PRT 812521 Amendment Biological Opinion (bull trout) and the PRT 1168 Biological Opinion, on which PRT 1168 is based, recognized that the riparian conservation strategy for the OESF is different than the strategy for other HCP planning units.

DNR was unable to locate the passage the commenter attributed to the USFWS incidental take permit. DNR interprets the passage as an excerpt from the *Notice of Application to Amend an Endangered Species Act Incidental Take Permit: Inclusion of Bull Trout on the Washington Department of Natural Resources Permit for Western Washington* (Federal Register Volume 63, Number 116 [Wednesday, June 17, 1998]), which goes on to state that “...provisions for the Olympic Experimental State Forest are described in the Plan on pages IV 81-86, 106-121.”

Neither passage should be construed as a change to the riparian protection measures described in the HCP for the OESF. Such a change would be subject to Section 25.0 of the Implementation Agreement, which addresses amendments and modifications to the HCP.

**No.:** 149

**Topic:** Recommended Expansion of Riparian Buffers

**Source:** Monica Fletcher, Sierra Club, pages 1 and 2

The Sierra Club recommends that DNR place even greater emphasis on protecting headwaters, safeguarding and supporting “core” unroaded forest lands, and providing buffers that sometimes serve as corridors connecting core areas. Buffers to protect core habitat and water systems are crucial at every scale, and should be expanded.

**Response:** Following is a summary of DNR’s approach to headwater streams, core unroaded areas, and corridors.

### ***Headwater Streams***

DNR uses the term “headwaters” to refer collectively to the entire non-fish-bearing stream network, including Type 4 and Type 5 streams. Under the Landscape and Pathways alternatives, DNR applies an interior-core buffer to Type 5 streams on potentially unstable slopes or landforms; the interior-core buffer on these streams encompasses the stream and the potentially unstable slope or landform on which the stream is located. Type 5 streams on stable ground do not receive an interior-core buffer. Type 5 streams on both stable ground and potentially unstable slopes or landforms will be protected with a 30-foot equipment limitation zone. DNR does not apply exterior buffers to Type 5 streams on stable ground or potentially unstable slopes or landforms.

Under the Landscape and Pathways Alternatives, along Type 4 streams DNR will apply an interior-core that extends an average of 100 feet outward horizontally from outer edge of the 100-year floodplain. Along segments of the interior-core buffer that have the potential for severe endemic windthrow, DNR will either apply an 80-foot exterior buffer or reconfigure the shape and orientation of the harvested edge, distribution of leave trees, or both to reduce severe endemic windthrow risk.

DNR submits that the Landscape and Pathways alternatives increases protection to headwater streams, compared to DNR’s current implementation, through a re-interpretation of how interior-core buffers are applied. DNR’s current implementation of its riparian conservation strategy is guided by the principle working hypothesis that buffers designed to minimize mass wasting and blowdown will be sufficient to protect other key physical and biological functions of riparian systems (DNR 1997, p. IV.106). An interior-core buffer is applied to floodplains and potentially unstable slopes or landforms; an exterior buffer is applied to all interior-core buffers. Under the current implementation, Type 4 streams on stable ground receive an interior-core buffer that encompasses the 100-year floodplain, and an exterior buffer that measures, on average, 50 feet per side of the stream.

### ***Core Unroaded Areas***

None of the alternatives (No Action, Landscape, Pathways) include explicit provisions for the maintenance of unroaded areas. DNR manages its road network in accordance with Policy PO14-028 *Developing and Maintaining Roads*, which directs DNR to minimize adverse environmental impacts by relying on the requirements of the HCP, state forest practices rules, and SEPA, and to minimize the extent of the road network, consistent with other Board of Natural Resources policies.

### ***Corridors***

None of the alternatives (No Action, Landscape, Pathways) include explicit provisions for providing connectivity among habitat patches. Instead, DNR expects that connectivity may result from managing forest stands and landscapes to meet its

conservation objectives for riparian ecosystems, northern spotted owls, and marbled murrelets.

**No.: 150**

**Topic: Infrequent Application of Exterior Buffers Under Landscape Alternative**

**Source: Mike Haggerty, OFCO, page 12**

The proposed action alternative essentially removes the exterior buffer from the riparian management zone. Type 1 through 4 streams contain numerous reaches with little or no area classified as potentially unstable. If exterior buffers are not applied to these stream segments, there would be no riparian forest protection.

**Response:** Under the Landscape and Pathways alternatives, on Type 1 through 4 streams DNR will apply an interior-core buffer similar to those listed in Table IV.10 of the HCP. In addition to this protection, the interior-core buffer on Type 1 through 4 streams will encompass potentially unstable slopes or landforms that have the potential to deliver sediment or debris to the stream network. On Type 1 through 4 streams, along segments of interior-core buffers that have the potential for severe endemic windthrow, DNR either will apply an exterior buffer or reconfigure the shape and orientation of the harvested edge, distribution of leave trees, or both to reduce severe endemic windthrow risk.

Additional riparian protection is provided by implementing DNR's other conservation strategies, which results in partial or complete deferral of much of the area in which exterior buffers would be located if they were applied. Approximately 47 percent of the area located between 150 and 300 feet from Type 1 and 2 streams, between 100 and 250 feet from Type 3 streams, and between 100 and 150 feet of Type 4 streams is partially or completely deferred from harvest. These areas would retain forest cover regardless of whether DNR's assessment concluded an exterior buffer was necessary.

**No.: 151**

**Topic: Infrequent Application of Exterior Buffers Under Landscape Alternative**

**Source: William Spring, page 1; David Mann, OFCO, page 4; Mike Haggerty, OFCO, page 11; Marcy Golde and Hellmut Golde, Ph.D., OFCO, page 73**

The Landscape Alternative essentially removes exterior buffers from the riparian management zone; only 1 percent of streams would have exterior buffers. This is inconsistent with the riparian conservation strategies of the HCP, which foresaw exterior buffers on 75 to 85 percent of streams, and will not be protective of bull trout.

The retention of such buffers on 1 percent of streams is not even a token presence, and constitutes an affront to the objectives and philosophy of the OESF. With exterior buffers essentially excluded, the Landscape Alternative results in a significant decline in the expected average riparian buffer width along multiple stream types. Type 1 and 2 streams will receive half of the expected average buffer width of 300 feet as described in the HCP; Type 3 streams will receive less than 40 percent of the expected average width of 250 feet.

This proposal, if implemented, would assure rapid degradation of riparian habitat and water quality, thus further degrading salmonid survival in OESF rivers and streams and compromising habitat restoration values at the core of the OESF mission. Extreme winter rainfall events combined with periodic extreme wind events associated with Pacific storms make the presence of these exterior buffers critically important to both restrict episodic sediment loads from reaching streams and rivers and to prevent windthrow damage to interior-core buffers.

All buffers must be fully retained in undisturbed condition, consistent with HCP riparian management zone specifications.

**Response:** DNR’s HCP described two approaches for applying exterior buffers in the OESF: a standard approach, and an experimental approach. Under the standard approach, “...wind buffers are placed on all riparian segments for which stand wind-firmness cannot be documented by historical information, windthrow modeling, or other scientific means” (DNR 1997, p IV.117). The HCP anticipated the standard approach would be applied on approximately 75 to 85 percent of riparian areas. The standard approach does not require exterior buffers on all riparian segments. Instead, it directs DNR to apply exterior buffers only on those riparian segments for which wind-firmness cannot be documented.

Under the Landscape and Pathways alternatives, DNR will use a windthrow probability model (along with remote reconnaissance and field assessments as needed) to identify segments of interior-core buffers with the potential for severe endemic windthrow. In identified areas, DNR will either apply an exterior buffer or reconfigure the shape and orientation of the harvested edge, distribution of leave trees, or both to reduce severe endemic windthrow risk.

DNR submits that its use of windthrow modeling to document wind firmness is consistent with the HCP. Since exterior buffers are not necessary at all locations, the total riparian buffer width specified by the HCP is not the sum of the expected average widths of the interior-core and exterior buffers, as the commenter suggests.

Additional riparian protection is provided by implementing DNR’s other conservation strategies, which results in partial or complete deferral of approximately 47 percent of the area where exterior buffers are located (refer to Comment 150 for more information). These areas would retain forest cover regardless of whether DNR’s assessment concluded an exterior buffer was necessary.

**No.:** 152

**Topic:** Infrequent Application of Exterior Buffers Under Landscape Alternative

**Source:** Mike Haggerty, OFCO, page 10

By essentially eliminating exterior buffers, the Landscape Alternative has established new management prescriptions and policies for implementing the riparian conservation strategy without following the guidance established in the HCP.

The HCP directs DNR to conduct experiments in the exterior buffer to gain new knowledge to improve management techniques in riparian forests (DNR 1997, p. IV.112). Such knowledge was

to be applied to the design and layout of exterior buffers. However, experimentation on exterior buffers never occurred.

**Response:** DNR believes that its use of a windthrow model to document wind firmness is consistent with its HCP, which directs that “...wind buffers are placed on all riparian segments for which stand wind-firmness cannot be documented by historical information, windthrow modeling, or other scientific means” (DNR 1997, p IV.117).

To date, DNR has not conducted experiments on wind buffers in the OESF. However, the windthrow model DNR utilized for its analysis (Mitchell and Lanquaye-Opoku 2007) is built from empirical data. The model was developed through a retrospective analysis of the extent, severity, and causal factors of windthrow in the outer Washington coast over a 10 year period. DNR believes that its development and application of the model is in keeping with the HCP direction of “gaining new knowledge to improve management techniques in riparian forests.”

**No.:** 153

**Topic:** Addressing Windthrow for Riparian Buffers Under Landscape Alternative

**Source:** Mike Haggerty, OFCO, pages 9, 10, and 26; Marcy and Hellmut Golde, Ph.D., page 69

The measurable objective presented in the forest land plan of protecting the integrity of riparian forest from severe endemic windthrow is a significant divergence from the HCP’s riparian conservation strategy for the OESF. DNR has redefined exterior buffers to only address one narrow category of windthrow. This contrasts with one of the primary working hypotheses of this strategy, which addresses both endemic and catastrophic windthrow.

In the RDEIS, DNR defines endemic windthrow as that which results from routine peak winds with short return intervals (less than 5 years between events); and catastrophic windthrow as that which results from longer return periods (typically greater than 20 years between events). The RDEIS states that DNR cannot and will not protect against catastrophic windthrow.

DNR’s proposal to only protect for endemic windthrow is flawed. This proposal is analogous to designing a culvert to pass a 2-year flood, but not 5, 10, 20, 50, or 100-year flood events. Only protecting for high recurrence interval winds (frequent but less severe) and not moderate or low recurrence interval winds (less frequent but more severe) is inconsistent with the HCP goal of minimizing the damaging effects of windthrow on the riparian area. The RDEIS fails to consider wind events with a recurrence interval of 5 years or greater. This failure likely violates the intent and protections of DNR’s HCP. It appears that DNR lacks a model to estimate moderate and low recurrence interval windstorms and therefore did not analyze their impacts.

As described in the HCP, the exterior buffers are supposed to have several functions in addition to minimizing windthrow. These functions include maintaining channel-floodplain interactions, moderating microclimate, shielding interior-core buffers from physical and ecological disturbances, and maintaining diverse habitat for riparian and upland biota. These functions will not be met under DNR’s narrowly-defined proposal of when to apply an exterior buffer.

DNR’s approach also fails to consider how significantly reduced riparian buffer widths would affect wildlife and the development of northern spotted owl habitat. The HCP describes the combined expected average width of the interior-core and exterior buffers as 250 feet on each side of Type 3 streams. Under the Landscape Alternative, these streams will only receive a 100-foot buffer. In addition, it appears that this buffer may be reduced to 97 feet during the first decade, which is a 60 percent reduction in riparian buffer and the habitat that it provides along these streams. This reduction will confine habitat to smaller stands with a large amount of edge.

Changing the way in which the HCP is implemented in such a significant way without any attempt to estimate the impact on the environment or to minimize or mitigate impacts to listed species is unlikely to comply with the Endangered Species Act.

**Response:** Under the Landscape and Pathways alternatives, DNR will use a windthrow probability model (along with remote reconnaissance and field assessments as needed) to identify segments of interior-core buffers with the potential for severe endemic windthrow. Endemic windthrow results from routine peak winds with short return intervals. Endemic windthrow is strongly influenced by site conditions and silvicultural practices, and can therefore be predicted (Lanquaye 2003). Catastrophic windthrow, by contrast, is not correlated with stand and site conditions (Zielke and others 2010). DNR cannot and does not protect against catastrophic windthrow. DNR submits that its focus on endemic windthrow is consistent with its HCP, which, in describing exterior buffers, states: “Widths for exterior buffers were estimated by qualitatively evaluating historical patterns of windthrow resulting from average winter storms in the OESF...” (DNR 1997, p IV.112).

The windthrow probability model (Mitchell and Lanquaye-Opoku 2007) DNR uses calculates the exceedance probability of severe endemic windthrow, defined as endemic windthrow in which 90 percent of the area experiences 50 percent canopy loss. Exceedance probability is the probability that the specified level of windthrow is met or exceeded; the model calculates the probability that the threshold of “90 percent of the area experiencing 50 percent canopy loss” is met or exceeded. All severe endemic windthrow events at or above this threshold are included in the calculation, regardless of their return interval.

Although the windthrow probability model indicates the probability of severe endemic windthrow is very low, DNR may conclude that an exterior buffer is necessary for other reasons, including field assessments or remote reconnaissance, as described above. In addition, as a result of implementing DNR’s other conservation strategies, approximately 47 percent of the area in which exterior buffers are located is partially or completely deferred for other reasons and would retain forest cover regardless of whether DNR’s assessment concluded an exterior buffer was necessary (Refer to Comment 151 for more information).

DNR’s HCP does not require exterior buffers on all riparian segments. Instead, it directs DNR to apply exterior buffers only on those riparian segments for which wind firmness cannot be documented. Since exterior buffers are not necessary at all locations, the total riparian buffer width specified by the HCP is not the sum of the expected average widths

of the interior-core and exterior buffers (for example, 250 feet along all Type 3 streams), as suggested by the commenter.

**No.: 154**

**Topic: Application of Exterior Buffers Under the Landscape Alternative**

**Source: William Fleck, City of Forks, page 6**

The analysis concerning the application exterior buffers appears to be properly applied and would only impact at most approximately 26 acres within the OESF. The City of Forks supports the analysis and its method of applying exterior buffers to riparian areas whose probability of experiencing severe endemic windthrow is greater than 5 percent. Establishing a higher probability threshold would require additional analysis and literature support.

**Response:** Comment noted.

**No.: 155**

**Topic: Methodology for Predicting Windthrow**

**Source: Mike Haggerty, OFCO, page 10**

DNR's method for calculating the probability of windthrow is in error. In its analysis, DNR only examines the wind prone area (the portion of the riparian area within 25 meters of an edge) and not the entire riparian area as is done outside of the OESF.

**Response:** The windthrow probability model limits its area of analysis to within 25 meters of the forest edge based on published studies of windthrow along harvest edges on Vancouver Island, British Columbia. Lanquaye (2003) observed that the likelihood of windthrow declined with increasing distance from the forest edge. Windthrow was observed in 13 percent of segments within the first 25 meters, but only 1 percent of segments located between 50 and 75 meters. Lanquaye also observed that the severity of windthrow declined with distance: less than 25 percent of the damage occurred further than 25 meters from the edge, and less than 10 percent occurred further than 50 meters from the edge.

It is neither expected nor intended that the exterior buffer will prevent all windthrow from occurring in the interior-core buffer. Windthrow in streamside forests is a normal occurrence, and serves as an important mechanism for the recruitment of large woody debris to the stream channel. However, DNR relies on interior-core buffers to maintain a range of ecosystem functions, which may be compromised if excessive windthrow occurs.

**No.: 156**

**Topic: Determining Riparian Buffers Using Current Methods Versus Landscape Alternative**

**Source: Fawn Sharp, Quinault Indian Nation, page 5**

The Quinault Indian Nation would like to better understand DNR's current, on-the-ground methods for determining buffer configuration versus those proposed under the Landscape Alternative.

**Response:** For a description of the design and implementation of riparian management zones, refer to “Implementation of the Riparian Conservation Strategy” on pages 2-16 through 2-21 of the RDEIS.

**No.:** 157

**Topic:** Riparian Assessment Area in Forest Estate Model

**Source:** Fawn Sharp, Quinault Indian Nation, page 2

The “riparian assessment area,” used to assess riparian function within the forest estate model, is patterned after the expected average width interior-core and exterior buffers described in the HCP. However, the actual riparian buffers resulting from implementing the forest land plan may differ from the riparian assessment area due to experimentation and variation in on-the-ground conditions. Using a riparian assessment area that differs from the actual buffers is misleading; the buffers are not clearly defined. The RDEIS uses language such as “similar” and “generally” when comparing the proposed buffers to those described in the HCP. This is troubling. The forest land plan uses language that could allow harvest in important riparian zones and such harvests are not accounted for in the forest estate model or the impact analysis.

**Response:** DNR uses the term “riparian assessment area” to refer to the area within which riparian function is assessed. The term “riparian buffer” refers to the forested area adjacent to a stream channel that remains following a timber sale. Riparian function within the riparian assessment area is evaluated (both internally to the analysis model and again as part of the EIS) regardless of whether a riparian buffer is present. This method is by design, and ensures that the effects of the presence or absence of a riparian buffer is properly reflected in the environmental analysis.

The location, size, type, and timing of all proposed harvests, known as the “harvest schedule,” is an output of the analysis model, and therefore, by construction, is accounted for in the analysis model. In developing the harvest schedule, the analysis model is subject to a series of ecological objectives (known as “constraints” and “goals”) including the maintenance and restoration of large woody debris recruitment, riparian shade, and the prevention of detectable increases in peak flow. For a further description, refer to Appendix D, Modeling, p. D-81 through D-85. The harvest schedule is further evaluated in the RDEIS, including an analysis of a suite of riparian functions (large woody debris recruitment, leaf and needle litter recruitment, coarse and fine sediment delivery, peak flow, stream shade, microclimate, and watershed condition). Refer to Riparian, page 3-45 of the RDEIS. Timber sales are also subject to SEPA review before they are implemented.

**No.:** 158

**Topic:** Increased Riparian Harvest Under Landscape Alternative

**Source:** Dave Werntz, OFCO, page iv; Miguel Perez-Gibson, OFCO, page v; David Mann, OFCO, page 4; Mike Haggerty, OFCO, page 31; Marcy Golde and Hellmut Golde, Ph.D., OFCO, pages 69, 71, and 72; Monica Fletcher, Sierra Club, page 2; Gary Bell, WDFW, page 3

The Landscape Alternative significantly increases harvests in riparian buffers compared to the HCP. The HCP only allows very limited harvest in the interior-core buffer and states that 1) no timber harvest shall occur within 25 feet of the 100-year floodplain, 2) the next 75 feet shall be a minimal-harvest area where the only silvicultural activities are ecosystem restoration and selective removal of single trees, and 3) the remaining portion of the riparian buffer shall be a low-harvest area (DNR 1997, p. IV 59-60). Riparian buffers under the Landscape Alternative, in contrast, are subject to extensive, repeated harvests, such as multiple thinnings and limited clearcutting in the interior-core buffer.

In the first decade, 192 out of 587 (32.8 percent) Type 3 watersheds will suffer some degree of clearcutting in the riparian buffer. Because of these harvests, none of these 192 watersheds will receive the full interior-core buffers specified in the HCP. Under DNR’s proposal, clearcut harvests will reduce the interior-core buffer to an average of 135.5 feet along Type 1 and 2 streams in 53 watersheds, with a minimum of 98 feet; and reduce the interior-core buffer to an average of 91 feet along Type 3 and 4 streams in 192 watersheds, with a minimum of 64 feet.

The Landscape Alternative increases the number of stand entries within most landscapes, purportedly to decrease stand densities, address forest health, and help move a stand from the Competitive Exclusion to the Understory Development stage of stand development. Increased stand entries in riparian areas, compared to the No Action Alternative, will result in significant adverse impacts if done without appropriate mitigation measures.

Riparian buffer zones are fragile and functionally important. DNR should avoid harvest in these areas as such harvests would harm fish populations, destabilize stream conditions, and increase the frequency of flooding. Riparian habitats are extremely sensitive to disturbance related to sediment delivery. Such disturbances could adversely affect water quality, stream-associated amphibian habitat, and instream fish habitat. The Landscape Alternative’s proposal for increased riparian stand entries will have both project-specific and cumulative impacts.

Forest management that results in a decline in the potential to recruit large woody debris to a fish bearing streams should only happen in conjunction with restoration actions. Clearcut harvests should not occur in the area from which large woody debris is recruited to Type 1 through 3 streams.

**Response:** The commenter’s citation (DNR 1997, p. IV 59-60) concerning timber harvest in riparian management zones applies to the five west-side HCP planning units; it does not apply to the OESF. As stated in the HCP, “No specific restrictions on management activities are given in the riparian conservation strategy [for the OESF], other than on road-building” (DNR 1997, p. IV.128). Harvesting in interior-core buffers can occur, provided that management activities are consistent with the conservation

objectives (DNR 1997, p. IV.109). The HCP states that “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” (DNR 1997, p IV.127).

DNR’s proposal for the Landscape Alternative does not include clearcut harvests within the interior-core buffer. It does, however, propose a limited amount of variable retention harvest in the interior-core buffer. For a description of the distinction between clearcut and variable retention harvests, refer to Text Box 3-1, “Examples of Harvest Methods” on page 3-23 of the RDEIS.

The amount of variable retention harvest in the interior-core buffer is determined through a watershed assessment process in the forest estate model. The amount is generally very small. Based on the environmental analysis presented in the RDEIS, DNR concluded that this level of harvest would not result in probable significant adverse environmental impacts.

**No.: 159**

**Topic: Justification of Riparian Harvests Under Landscape Alternative**

**Source: Mike Haggerty, OFCO, pages 12 and 13**

The process and justification for clearcut harvests in the interior-core buffer is poorly defined for the Landscape Alternative. Figure 2.2 in the RDEIS implies the process might include reducing the width of the riparian buffer along Type 1 and 2 streams where unstable slopes exceed 150 feet in width, or along Type 3 streams where unstable slopes exceed 100 feet in width.

Harvest levels for the Landscape Alternative are higher than the No Action Alternative. It appears this is mainly a result of reduced riparian protection along Type 3 streams, but the RDEIS doesn’t contain this information. No description of the acres of riparian habitat protected by each alternative, or how this compares to the HCP is provided.

**Response:** DNR’s proposal for the Landscape Alternative does not include clearcut harvests within the interior-core buffer. It does, however, propose a limited amount of variable retention harvest in the interior-core buffer. For a description of the distinction between clearcut and variable retention harvests, refer to Text Box 3-1, “Examples of Harvest Methods” on page 3-23 of the RDEIS.

The amount of variable retention harvest in the interior-core buffer is determined through a watershed assessment process in the forest estate model. The amount is generally very small. Based on the environmental analysis presented in the RDEIS, DNR concluded this level of harvest would not result in probable significant adverse environmental impacts.

Under the Landscape Alternative, the interior-core buffer will encompass potentially unstable slopes or landforms with the potential to deliver sediment and debris to the stream network. DNR does not reduce the buffer width based on the extent of the potentially unstable area.

**No.:** 160

**Topic:** Riparian Harvests

**Source:** Mike Haggerty, OFCO, page 26

Silvicultural activities should not appreciably reduce the riparian habitat potential, especially not within the area from which large woody debris is recruited. The management goal should be to maintain and aid the restoration of riparian function. Short- and medium-term reductions in habitat potential should be limited to activities conducted for the purpose of restoring riparian function; DNR should not simply clearcut portions of the riparian area for timber production.

**Response:** As stated in DNR’s HCP, “No specific restrictions on management activities are given in the riparian conservation strategy, other than on road-building” (DNR 1997, p. IV.128). Harvesting in interior-core buffers can occur, provided that management activities are consistent with the conservation objectives (DNR 1997 IV.109). As stated in DNR’s HCP, “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” (DNR 1997, p IV.127).

DNR submits that the analysis presented in the RDEIS demonstrates that the proposed level of riparian harvest does not result in probable significant adverse environmental impacts to riparian function, including the recruitment of large woody debris. In keeping with the stated objectives, DNR’s analysis of riparian function, including large woody debris recruitment potential, is reported at the watershed level as shown in Charts 3-22 through 3-24, on pages 3-68 and 3-69 of the RDEIS. These charts show the distribution of watershed-level large woody debris recruitment potential for approximately 400 Type 3 watersheds within the OESF, and illustrate a gradual, but steady improvement in conditions over time.

DNR’s proposal for the Landscape and Pathways alternatives does not include clearcut harvests within the riparian area. It does, however, propose a limited amount of variable retention harvest in the interior-core buffer. For a description of the distinction between clearcut and variable retention harvests, refer to Text Box 3-1, “Examples of Harvest Method” on page 3-23 of the RDEIS.

**No.:** 161

**Topic:** Riparian Harvests

**Source:** William Fleck, City of Forks, page 6

DNR’s HCP firmly established the concept of managing riparian areas within the OESF. Harvest activities are permitted, as long as they encourage riparian function or do not detract from the objectives of the riparian conservation strategy. The City of Forks supports such activities and believes that DNR must ensure that available management options are utilized.

**Response:** Comment noted.

**No.:** 162

**Topic:** Riparian Buffers Inadequate Under the Landscape Alternative to Supply Large Woody Debris

**Source:** Mike Haggerty, OFCO, page 31

The Landscape Alternative allows for a significant reduction in large woody debris recruitment to Type 3 streams. The proposed 100-foot riparian buffers would only supply 74 percent of the large woody debris for a 170-foot tall stand. It is unclear how this reduction maintains or restores riparian function for stands that are already functioning properly.

**Response:** DNR’s analysis indicates that implementation of the Landscape Alternative would not result in probable significant adverse impacts to large woody debris recruitment. DNR analyzed the effects of harvest within the area from which large woody debris is recruited along all stream types (including Type 3 streams) and concluded that watershed-level large woody debris recruitment would steadily improve over time under the Landscape Alternative (refer to pages 3-67 through 3-70 of the RDEIS).

Under the Landscape Alternative, along Type 3 streams DNR will apply an interior-core buffer that will extend 100 feet outward horizontally from the outer edge of the 100-year floodplain. This width may be adjusted by the number of acres of regeneration harvest (“allotted acres”) that may occur each decade without impeding riparian function within the interior-core buffers of Type 1 through 4 streams in each Type 3 watershed (refer to Chapter 2 of the FEIS for more information). The interior-core buffer also will encompass potentially unstable slopes or landforms that can deliver sediment or debris to the stream network.

Aside from application of interior-core buffers, a number of additional factors contribute to the improvement of watershed-level large woody debris recruitment over time: 1) harvest would not occur along all Type 3 streams, 2) some Type 3 streams would also receive exterior buffers, and 3) some Type 3 streams would be deferred from harvest for other reasons.

The commenter’s statement that 100-foot interior-core (riparian) buffers would supply 74 percent of large woody debris for a 170-foot tall stand is consistent with the general trigonometric model of large woody debris recruitment presented in McDade and others (1990). As a conservative measure, DNR incorporated this trigonometric model into its analysis. This methodology, however, likely overestimates the wood recruitment potential of areas located further from the stream. Several more recent studies published since the HCP was adopted attribute 50 to over 95 percent of large woody debris recruitment to areas within 30 meters of the channel (Bragg 2000, Welty and others 2002, Gregory 2003, May and Gresswell 2003, Benda and others 2003, Liquori 2006). Martin and Grotfendt (2007) found that approximately 80 percent of trees that fell into Type 4 streams originated from within 10 meters (33 feet) of the bank. Johnston and others (2007) reviewed 137 source distance curves from 13 separate studies, most from coniferous forests along the Pacific Coast of the United States. They report the median source distances for 90 percent of the cumulative large woody debris volume inputs

varied between 20 to 65 feet for the three dominant delivery mechanisms (bank erosion, tree fall, and landslides).

**No.:** 163

**Topic:** **Riparian Buffers Inadequate Under the Landscape Alternative to Provide Riparian Function**

**Source:** **Mike Haggerty, OFCO, pages 12 and 13**

The proposed 100-foot buffers along Type 3 streams are narrower than those recommended in literature for large woody debris recruitment, stream shade, microclimate, and water quality. While the HCP also called for 100-foot buffers along Type 3 streams, additional riparian function is provided by the presence of an exterior buffer. The reduced buffers of the Landscape Alternative, coupled with the absence of an exterior buffer to provide additional riparian function, do not appear to comply with the requirements or intent of the HCP riparian conservation strategy or the associated incidental take permits.

The Landscape Alternative reduces the current status quo management for Type 1 through 3 streams without providing any logical rationale. This is a major change in how the HCP is implemented and should require an amendment to the HCP. It seems illogical to apply the same riparian protection to non-fish-bearing waters (Type 4) as Type 3 streams containing salmon stocks listed as depressed or critical, or threatened or endangered under the Endangered Species Act. It appears the HCP took this into account by providing 150-foot exterior buffers along Type 3 streams, compared to 50-foot exterior buffers along Type 4 streams.

Interior-core buffers along Type 1 through 3 streams should be no less than the 100-year site potential tree height or 150 feet, whichever is greater. There is little to no scientific rationale for varying buffer width by stream type.

**Response:** DNR submits that the proposed interior-core buffers along Type 3 streams are consistent with those proposed in the literature for large woody debris recruitment, stream shade, and water quality, as summarized in this response. Although the proposed buffers are narrower than the width of microclimate gradients described in the scientific literature, DNR's analysis of riparian microclimate indicated that implementing the Landscape Alternative would not result in probable significant adverse environmental impacts for that indicator.

#### ***Large Woody Debris Recruitment***

The interior-core (riparian) buffers described in the HCP are based, in part, on studies of large woody debris recruitment in "old-growth conifer" stands in the Cascade and Coast Ranges of Oregon and Washington as described in McDade and others (1990). Their findings indicate that approximately 45 percent of large woody debris originates within 10 meters (33 feet) of the stream, 85 percent within 30 meters (100 feet), and 100 percent within 50 to 55 meters (165 to 182 feet). For mature hardwoods, they estimated that 100 percent of large woody debris originates within 25 meters (83 feet) of the stream. Murphy and Koski (1989) suggest that buffers 30 meters (100 feet) wide will provide an adequate supply of large woody debris; however, their study was conducted in Alaska where the height of riparian trees is less than in Washington.

Several more recent studies published since the HCP was adopted attribute 50 to over 95 percent of large woody debris recruitment to areas within 30 meters of the channel (Bragg 2000, Welty and others 2002, Gregory 2003, May and Gresswell 2003, Benda and others 2003, Liquori 2006). Martin and Grotefendt (2007) found that approximately 80 percent of trees that fell into Type 4 streams originated from within 10 meters (33 feet) of the bank. Johnston and others (2007) reviewed 137 source distance curves from 13 separate studies, most from coniferous forests along the Pacific Coast of the United States. They report the median source distances for 90 percent of the cumulative large woody debris volume inputs varied between 20 to 65 feet for the three dominant delivery mechanisms (bank erosion, tree fall, and landslides).

### ***Shade Source Distance***

The degree of shade provided by streamside buffers varies with the species, age, and density of riparian vegetation. Buffer width also is important, but by itself may not be a good predictor of stream shading (Sullivan and others 1990). Wooldridge and Stern (1979) and Beschta and others (1987) recognized the importance of direct solar radiation to stream heating and suggested a measure of shade which they called angular canopy density (ACD). They defined ACD as the portion of the sky occupied by canopy along the sun's path, usually between 10 am and 2 pm. In the Oregon Coast Range, Brazier and Brown (1973) found that buffers approximately 70 feet wide had ACDs similar to that of old-growth stands.

### ***Water Quality***

The principal causes of declining water quality in the OESF are water temperatures that exceed state and federal standards and turbidity associated with stream sedimentation (DNR 1997, p. IV.125). While there are still vigorous debates in the Pacific Northwest about the thermal impacts of forestry and how to manage them (Larson and Larson 1996, Beschta 1997, Ice and others 2004, Johnson 2004; as cited in Moore and others 2005), the conventional approach is to retain a forested buffer strip along the stream in an effort to shield streams from an increase in solar radiation, which is one factor driving summertime stream warming (Moore and others 2005). As described above, Brazier and Brown (1973) found that buffers approximately 70 feet wide had ACDs similar to that of old-growth stands. Studies of the efficacy of forest buffers in protecting against sediment impacts indicate that buffers ranging from 33 to 98 feet wide had relatively small increases in sediment yield (Gomi and others 2005).

### ***Microclimate***

Data on the magnitude and extent of microclimate gradients is limited. DNR based its analysis on the findings of Brosofske and others (1997), who demonstrated that streams exert a cooling effect on both soil and air temperatures at distances up to 164 feet from the stream, and increased relative humidity up to 122 feet from the stream. While these gradients exceed the width of the interior-core buffers along Type 3 streams proposed under the Landscape Alternative, DNR expects that additional factors will contribute to

the maintenance of riparian microclimate: 1) a subset of Type 3 streams will also receive exterior buffers, 2) harvest would not occur along all Type 3 streams, and 3) some Type 3 streams would be deferred from harvest as a result of implementing DNR's other conservation strategies.

**No.: 164**

**Topic: Riparian Buffers Under Landscape Alternative Inadequate to Protect Water Temperature**

**Source: Fawn Sharp, Quinault Indian Nation, page 4**

Water temperature exceedances evident in available data suggest the proposed experimental riparian buffers and other practices (under the Landscape Alternative) are insufficient to protect fish habitat in the Queets River watershed. Data gathered from Quinault Indian Nation monitoring efforts in 2013 show wide-spread temperature impairments in the Queets and Clearwater River watersheds that qualify for listing as impaired under Section 303d of the Clean Water Act. The analysis should address the presence of impaired water bodies within the management area.

**Response:** DNR's strategy for meeting state water quality temperature standards is to retain a forested buffer strip (buffer) along the stream in an effort to shield them from an increase in solar radiation. The width of the buffers under DNR's riparian conservation strategy are consistent with those suggested in scientific literature as sufficient to maintain suitable stream temperatures.

Documented occurrences of water temperature exceedances in areas where buffers were applied in accordance with DNR's conservation strategy warrant further investigation, and are best addressed through DNR's research and monitoring program and adaptive management process.

The commenter's statement of widespread water temperature impairments in the Queets River watershed is based on a data set collected in 2013, after DNR had completed its riparian analysis for the RDEIS. As described in the materials submitted with the public comments:

“Eighty-nine (89) total project thermistors were installed in 2013. Eighty-seven (87) of the eighty-nine (89) thermistors logged sufficient data to compute station 7DADM value. Sixty (60) of the 87 units (68.9%) with 7DADM values were determined to fail either the 12° C or 16° C criteria by at least 0.4° C. Another 3 of the 87 thermistors were determined to have 7DADM values that were within the accuracy specifications of the thermistors (+/- 0.3° C).”

The thermistors (temperature sensors) were installed across a variety of ownerships. Of the 63 that indicated stream temperatures in excess of state water quality standards (3 of which were within the margin of error of the thermistors), it appears that 14 were located on DNR-managed streams.

In 2012, DNR initiated a riparian status and trends monitoring project in the OESF, including continuous stream temperature monitoring and calculation of 7DADM. DNR's

monitoring includes 23 sample basins in the Queets River watershed, although none are coincident with the sites monitored by the Quinault Indian Nation.

**No.: 165**

**Topic: Operational Impacts Not Adequately Addressed**

**Source: Fawn Sharp, Quinault Indian Nation, pages 2 and 3**

The impact analysis does not adequately consider operational practices and what actually happens on the ground. Cumulative ecological impacts cannot fully be analyzed without considering operation practices and limitations. The analysis relies on the assumption that current practices have been meeting the intent of the HCP without any supporting data or monitoring results. Has a performance audit or other monitoring been conducted of harvest units completed since the HCP went into effect in 1997? Unless the results of the site-specific prescriptions are monitored, there is no way of determining if the practices are detrimental or beneficial to natural resources. It is not clear what monitoring has occurred and whether the results and impacts of the actual harvest are taken into account in the RDEIS analysis.

**Response:** DNR's impact analysis assumes all proposed, future forest management activities in the OESF will be conducted in accordance with the management strategies identified under each management alternative, as well as DNR policies, procedures, and applicable federal, state, and local laws. For an analysis of past forest management activities, refer to Chapter 4 of the RDEIS and FEIS (cumulative impacts).

DNR will conduct monitoring as part of implementing the forest land plan, and will use the information gathered through monitoring as well as research to evaluate potential changes in management through the adaptive management process. Refer to Chapter 4 of the draft forest land plan (Appendix A to the RDEIS) for a full discussion on these topics.

For a summary of recent implementation monitoring of the riparian conservation strategy in the OESF, refer to the 2007 Implementation Monitoring Report (DNR 2008): [http://wa-dnr.s3.amazonaws.com/publications/lm\\_hcp\\_im\\_report2007.pdf](http://wa-dnr.s3.amazonaws.com/publications/lm_hcp_im_report2007.pdf).

**No.: 166**

**Topic: Operational Impacts From Management Flexibility**

**Source: Fawn Sharp, Quinault Indian Nation, page 2**

The forest land plan allows flexibility during implementation to modify operational practices and vary riparian prescriptions on a site-specific basis without environmental review. The impacts of such flexibility are not adequately analyzed in the RDEIS or addressed in the forest land plan. The forest land plan should define strict guidelines to mitigate negative impacts from harvest operations. We understand that the forest land plan uses a phased review approach with site specific prescriptions identified later, but we question how environmental impacts of the plan are analyzed if procedures and occupational practices are ultimately not consistent within the plan. The level of flexibility within the plan and the lack of hard prescriptions raise the issue of whether the actual activities match the assumptions of the HCP.

**Response:** In accordance with SEPA, forest management activities are subject to additional environmental review prior to implementation.

**No.:** 167

**Topic:** Riparian Management Recommendations

**Source:** Fawn Sharp, Quinault Indian Nation, page 2

The Quinault Indian Nation recommends 1) clearly defining riparian management zone boundaries and the activities allowed within them, including no-cut zones; 2) limiting variable retention harvest and thinnings within the riparian zone; 3) no harvests within 150 feet of Type 1 through 3 streams; 4) no variable retention harvests within riparian zones on Type 1 through 3 streams.

**Response:** Within the OESF, DNR delineates riparian management zone boundaries in accordance with PR 14-006-093, *Timber Sale Marking and Painting Standards*. DNR follows a set of standardized marking practices along important features (such as riparian management zones) associated with timber sales and other management activities to avoid confusion on the ground.

DNR respectfully disagrees with the commenter’s recommendation of no harvests within 150 feet of Type 1 through 3 streams. As stated in the HCP, “No specific restrictions on management activities are given in the riparian conservation strategy, other than on road-building” (DNR 1997, p. IV.128). Harvesting in interior-core buffers can occur, provided that management activities are consistent with the conservation objectives (DNR 1997, p. IV.109).

DNR has proposed riparian thinning harvest and a limited amount of variable retention harvests within interior-core buffers under the Landscape Alternative. DNR submits that riparian thinning harvests can be an effective means of achieving riparian conservation objectives. Both uniform and variable density thinning can be used to promote habitat development and wind-firm trees.

The amount of variable retention harvest in the interior-core buffer was determined through a watershed assessment process in the analysis model. The amount is generally very small. Based on the environmental analysis presented in the RDEIS, DNR concluded this level of harvest would not result in probable significant adverse environmental impacts. These variable retention harvests must be located at least 25 feet from the outer edge of the 100-year floodplain.

**No.:** 168

**Topic:** Failure to Identify Impacts of Climate Change

**Source:** Fawn Sharp, Quinault Indian Nation, page 4

The conclusion that neither alternative will result in probable significant adverse environmental impacts to water quality fails to consider adverse hydrologic effects and predicted increases in air temperature in the next 50 to 100 years resulting from climate change.

**Response:** New scientific literature suggests that climate change could affect forest conditions, watershed processes, fish, and northern spotted owls. However, DNR has determined that this new information on the potential effects of climate change does not provide a basis for meaningful environmental analysis. A primary reason is the lack of specificity or consensus on the timing and severity of climate change. The extent to which Pacific Northwest forests and the plant, fish, and wildlife species associated with them may be affected by climate change is still an emerging science, and although modelling efforts are underway, detailed models of these potential impacts at spatial scales meaningful to this proposal are not available at this time. DNR has determined that it is too speculative to predict exactly how or to what extent the conclusions of this analysis will be altered by climate change and therefore did not do so in this RDEIS.

For the FEIS, DNR added information to the climate change analysis about how climate change may affect state trust lands. The new information includes a discussion about potential changes to riparian areas and fish survival (refer to “Climate Change” in Chapter 3 of the FEIS).

**No.: 169**

**Topic: Weighting Composite Watershed Score**

**Source: David Montgomery, Ph.D., OFCO, page 81**

DNR applies arbitrary weighting to various indicators to arrive at a composite watershed score. This approach fails to consider the varying importance of different features and indicators in different portions of the same watershed. The lack of a spatial structure to the composite assessment makes it a very crude tool indeed. Why, for example, would "coarse sediment" amount to less than 10 percent of the impact score for a place like the channels downstream from Huelsdonk Ridge, where the coarse sediment impacts were devastating for certain salmon bearing streams, but did indeed only cover a small portion of that basin?

**Response:** The framework of the model used to calculate the composite watershed score was based on a review of available literature (Reeves and others 2004, Gallo and others 2005, Mathews 2007), as adapted to work with the available data, and the professional judgment of DNR scientific staff.

**No.: 170**

**Topic: Stream Typing/Compliance with HCP**

**Source: Chris Mendoza, OFCO, pages 84, 85, 86, and 93**

DNR is failing to comply with the physical criteria specified in the HCP for classifying Type 4 and 5 streams and consequently, may not be providing adequate stream buffer protection. Studies of non-fish-perennial waters by Pleus and Goodman (2003) and Palmquist (2005) indicate that the vast majority of stream channels were greater than 2 feet wide all the way upstream to the perennial initiation point, and in many cases to the channel head where the well-defined channel ends.

In addition, a retrospective study of the Trust Lands HCP Interim Type 5 Conservation Strategy, conducted by DNR and presented to CMER in February 2009, reveals that many streams on

DNR-managed lands meet the physical criteria for Type 4 waters, but are incorrectly classified as Type 5.

Based on these findings, coupled with 15 years of personal experience with field-validating DNR’s hydro layer, the Conservation Caucus strongly believes that a substantial portion of Type 5 waters in the OESF, as well as those located on other DNR-managed state lands, meet the physical criteria for Type 4 waters (ordinary high water mark greater than 2 feet wide) and should be buffered accordingly.

DNR must accurately and completely map all typed waters prior to approving forest practice permits. Accurate stream typing is critical for aquatic conservation. A 100-foot buffer is required along each side of Type 4 waters; Type 5 waters may be clearcut or only partially buffered depending on their proximity to unstable slopes. The large difference in the required protection of Type 4 versus Type 5 streams mandates that typing is accurately enforced and validated prior to approving forest practice permits.

**Response:** Verification of stream typing done in the field on individual timber sales is addressed through implementation monitoring or other means, not through the forest land planning process.

DNR conducts implementation monitoring as part of its HCP commitments. Refer to the 2007 Implementation Monitoring Report (DNR 2008) for a discussion of implementation monitoring of the riparian conservation strategy in the OESF: [http://wa-dnr.s3.amazonaws.com/publications/lm\\_hcp\\_im\\_report2007.pdf](http://wa-dnr.s3.amazonaws.com/publications/lm_hcp_im_report2007.pdf). Refer to Comment 171 for more information on stream typing.

**No.:** 171

**Topic:** Stream Mapping Data Quality

**Source:** Mike Haggerty, OFCO, page 14; Chris Mendoza, OFCO, pages 84, 89, 90, 93, 94, and 98

DNR’s existing hydro layer fails to accurately depict headwater (Type 4 and 5) streams. The existing hydro layer grossly underestimates their length and fails to accurately locate these streams on the landscape. This is a huge problem not adequately discussed in the RDEIS, given the complexity of the modeling effort. No meaningful discussion regarding the accuracy of the stream channel network as currently mapped is provided. A footnote stating that the current hydro layer is believed to underestimate Type 5 streams is a misrepresentation of what is known. For example, on DNR-managed lands in the OESF, Forest Practices classifies 39 percent more stream length as fish-bearing (Type F) than is shown on DNR’s hydro layer (Type 1 through 3). This is a significant difference. While DNR accounts for this discrepancy in a portion of the modeling that was conducted, it remains entirely hidden from readers of the document.

DNR’s hydro layer was largely generated and updated from a Cooperative Monitoring Evaluation and Research (CMER) committee study that attempted to model the extent of fish habitat (Fish Habitat Model Validation Study, CMER 2005). Channel gradient, one of four main input variables used in the fish habitat model, was derived from a 10-meter digital elevation model (DEM). However, the study concluded the 10-meter DEM was unable to adequately portray the subtle changes in topography and channel gradient often encountered in the Puget Sound

lowlands and foothills surrounding the Olympic Mountains. The study examined DNR’s hydro layer and found Type 4 and 5 streams were mistyped and needed to be “upgraded.” Inaccuracies in DNR’s hydro layer were also highlighted in an unpublished 2009 version of the DEIS which similarly concluded that Type 4 and 5 streams should be “upgraded.” In addition, a retrospective analysis of the Trust Lands HCP Interim Type 5 Conservation Strategy, conducted by DNR and presented to CMER in February 2009, clearly shows that DNR’s hydro layer grossly underestimates the extent of headwater channels and fails to correctly show their location on the landscape.

Maybe even more important is the total lack of discussion regarding the length of Type 4 streams present within the OESF. The RDEIS reports that 14 percent of the mapped stream network is Type 4 and over 61 percent is Type 5 (less than 2 feet wide). However, no attempt has been made to understand the inaccuracies in the hydro layer. What portion of the mapped Type 5 network is actually Type 4? Data collected within the Hoh River watershed as part of the 2001 and 2002 Perennial Initiation Study (Haggerty 2001, Haggerty 2003, Palmquist 2005) showed that fewer than 5 percent of the channel measurements were less than 2 feet wide, yet the RDEIS projects that 82 percent of mapped non-fish-bearing streams are less than 2 feet wide. As has been presented to DNR in multiple documents (Haggerty 2001, Haggerty 2003, and Haggerty 2004) and discussed in detail during the development of the forest land plan, it appears that much of the Type 5 channel network is actually Type 4.

Correcting for gross inaccuracies in water typing could potentially affect both individual indicator and watershed composite scores, given that the greatest proportion of the channel network is composed of Type 4 and 5 waters. It appears that thousands of hours have been spent modeling the impacts at the reach level across the landscape, yet no time has been spent trying to define the real-world channel network. Based on DNR’s inability to accurately locate and map the extent of headwater streams, until LiDAR replaces DNR’s existing hydro layer, any and all analysis of impacts from timber harvest along Type 4 and 5 streams included in the RDEIS should be rendered invalid.

**Response:** DNR relies upon its current GIS database for information on the location and typing of streams on DNR-managed lands. While the GIS database is periodically updated to correct inaccuracies using field surveys, DNR concurs that it is incomplete, with streams missing or mistyped.

DNR partially addresses the issue of mistyped streams by reconciling discrepancies between DNR’s state trust lands water typing and forest practices water typing systems. As described on page G-14 of Appendix G, Type 4, 5, and 9 streams (non-fish-bearing) with a Forest Practices water type code of ‘F’ (fish-bearing) were treated as if they were Type 3 streams.

The riparian impact analysis relies upon stream typing in only two ways: stream typing forms the basis of the estimated width of the 100-year floodplain, and defines the channel sensitivity to leaf and needle litter input. In both cases, the differences within headwater streams are minor: the 100-year floodplain for Type 4 streams was estimated as 3.75 feet per side of the channel for Type 4 streams, and 0 feet for Type 5 streams; both Type 4 and Type 5 streams were assigned a high sensitivity to leaf and needle litter

input. All streams, regardless of their type, were included in the riparian analysis. Aside from the differences in the 100-year floodplain described above, the area analyzed for each riparian indicator (the “area of influence”) did not vary by stream type. DNR therefore expects that mistyping of streams had a relatively minor effect on its impact analysis.

No correction was made for missing streams, however. Results from unpublished DNR studies of its stream network indicate that the majority of unmapped stream segments consist of headwater streams (Type 4 or 5). In the OESF, headwater streams are located largely, but not entirely, on potentially unstable slopes or landforms and are therefore protected by interior-core buffers. This protection partially offsets their omission from DNR’s GIS database.

SEPA rules outline the circumstances under which an agency may proceed with an analysis of significant adverse environmental impacts when faced with incomplete or unavailable information (WAC 197-11-080). Per WAC 197-11-080(2), the RDEIS acknowledges the information is lacking and substantial uncertainty exists. DNR acknowledges inaccuracies in the data in a footnote on page 3-20 of the RDEIS, and identifies the issue as a key uncertainty in the forest land planning process in Chapter 4, Adaptive Management, of the Forest Land Plan.

DNR is currently working on developing a LiDAR-derived, typed, synthetic stream layer for western Washington as a means of addressing inaccuracies in its current GIS database. A pilot project in Capitol Forest, completed in 2013, demonstrated the efficacy of the modeling technique. In 2014, DNR contracted for additional LiDAR coverage for the OESF. DNR did not complete a synthetic stream layer in time to be incorporated into the FEIS analysis. However, it is anticipated to be included in the tactical model in the future.

**No.:** 172

**Topic:** Stream Mapping Data Quality

**Source:** Mike Haggerty, OFCO, page 17

Numerous examples of conflicting results are evident in the data and models DNR used in its riparian analysis. The model DNR uses to calculate shade (Appendix G, Equation G-22) projects that stream width is greater than 2 feet once the contributing basin exceeds two acres. This suggests that most streams mapped as Type 5 on DNR’s hydro layer are actually Type 4 streams. For example, in Falls Creek (water resource inventory area 19.0143, located in the Clallam landscape) there is a stream with a basin area of 125 acres. Equation G-22 indicates the channel is 11.6 feet wide, while DNR’s hydro layer classifies the stream as Type 5 (less than 2 feet wide). Yet another model (the Forest Practices fish habitat model) estimates 1,000 feet of the Type 5 water is fish bearing.

The contributing basin upstream of the modeled fish/no fish break on Falls Creek is 74 acres. Here Equation G-22 estimates the channel to be 9.4 feet wide, but DNR’s hydro layer classifies the stream as Type 5 (less than 2 feet wide). Furthermore, an intrinsic potential model used in the fish analysis indicates 1,500 feet of “essential coho summer rearing habitat” is located in this sub-

basin, upstream of a known and mapped anadromous fish barrier. This example is not an isolated problem. A comparison of stream typing and basin areas suggests this issue is widespread throughout the OESF.

**Response:** DNR recognizes that the equation in question (Appendix G, Equation G-22) may over-predict bankfull width in small contributing basins, which could lead to questions about the accuracy of stream typing. However, DNR did not use this equation to determine stream type. Instead, this equation was used only to estimate the width of the canopy opening along stream segments as part of the stream shade and microclimate analyses. Over-predicting bankfull width would lead to an underestimate in both the shade and microclimate potentials, since the analysis would assume a larger canopy opening than actually exists. The result of underestimating shade and microclimate would mean that actual impacts are less than those projected in the RDEIS.

**No.:** 173

**Topic:** Stream Mapping Data Quality

**Source:** Chris Mendoza, OFCO, page 85, 93, 94, and 98

We applaud the use of LiDAR as a remote sensing tool directed at validating DNR's hydro layer and water typing system. We support the acquisition of full LiDAR coverage for all state trust lands managed under the HCP, and replacement of DNR's existing hydro layer with one derived from LiDAR.

**Response:** Comment noted. Refer to Comment 174.

**No.:** 174

**Topic:** Stream Typing Data Quality

**Source:** Chris Mendoza, OFCO, pages 94 and 98

The riparian impact analysis presented in the RDEIS will likely be affected by changes in water typing if LiDAR is acquired and utilized on the OESF. It is unclear to what extent LiDAR was used in the analysis.

**Response:** DNR relies upon its current GIS database for information on the location and typing of streams on DNR-managed lands. While the GIS database is periodically updated to correct inaccuracies using field surveys, DNR concurs that it is incomplete, with streams missing or mistyped.

The portion of DNR's GIS stream layer located in Clallam County was derived from LiDAR data. Otherwise, LiDAR data was not used in the riparian impact analysis. DNR is currently working on developing a LiDAR-derived, typed, synthetic stream layer for western Washington as a means of addressing inaccuracies in its current GIS database. A pilot project in Capitol Forest, completed in 2013, demonstrated the efficacy of the modeling technique. In 2014, DNR contracted for additional LiDAR coverage for the OESF. DNR did not complete a synthetic stream layer in time to incorporate it into the FEIS analysis. However, it is anticipated to be included in the tactical model in the future.

**No.:** 175

**Topic:** Measured Buffer Widths on Previous Harvests

**Source:** Marcie Golde and Hellmut Golde, Ph.D., OFCO, pages 70 and 72

Based on data from forest practices applications and SEPA documents, the average buffer widths on harvests between 2004 and 2010 were smaller than specified in the HCP. The average measured buffer widths were 58.8 feet on Type 1, 57.5 feet on Type 2, 25.4 feet on Type 3, and 19.9 feet on Type 4 streams. There is a dramatic discrepancy between the average interior-core buffer widths in the HCP and the widths of buffers on actual timber sales in this period. Three sales had interior-core buffers of 0 to 15 feet, thus averaging 7.5 feet. The main difference between the HCP and the measured averages from 2004 to 2010 was in the reduced average width of the interior-core buffer.

**Response:** DNR implements its current riparian conservation strategy in accordance with the principle working hypothesis that buffers designed to minimize mass wasting and blowdown will be sufficient to protect other key physical and biological functions of riparian systems (DNR 1997, p. IV.106). An interior-core buffer is applied to floodplains and potentially unstable slopes or landforms; an exterior buffer is applied to all interior-core buffers.

DNR believes its current implementation is consistent with the expected average width for interior-core and exterior buffers specified in the HCP. As stated in the HCP, “Widths of the interior-core buffer (Table IV.5) are given as average values because the lateral extent of riparian corridors varies locally with channel size, valley confinement, and landform characteristics. Furthermore, these widths should not be interpreted as maximum or minimum target values because site conditions might call for enlarging or reducing the buffer locally based on the extent of stable ground” (DNR 1997, p. IV.111).

Under DNR’s current implementation, interior-core buffers along streams on stable ground encompass the 100-year floodplain. At these locations, the interior-core buffer is narrower than the expected average buffer widths specified in Table IV.5 (DNR 1997, p. IV.58). However, interior-core buffers along streams on potentially unstable slopes or landforms are typically wider than the specifications in Table IV.5. The calculation of the average width of the interior-core buffer includes streams on both stable and potentially unstable ground. On average, interior-core buffers under DNR’s current implementation are consistent with Table IV.5.

DNR conducts implementation monitoring as part of its HCP commitments. DNR has previously conducted implementation monitoring of the OESF riparian conservation strategy, including stream typing and buffer measurements. Refer to the 2007 Implementation Monitoring Report (DNR 2008): [http://wa-dnr.s3.amazonaws.com/publications/lm\\_hcp\\_im\\_report2007.pdf](http://wa-dnr.s3.amazonaws.com/publications/lm_hcp_im_report2007.pdf).

**No.: 176**

**Topic: Classifying Streams as Type 4 Based on Channel Definition**

**Source: Mike Haggerty, OFCO, page 19**

At the policy level, DNR has changed or reinvented the definition of a stream channel to exclude all channel forms that are not "well defined" from classification as Type 4 (Sackett 2013). The unilateral decision to only consider well-defined channel reaches as Type 4 water excludes poorly defined channels from being classified as Type 4 water. This policy ignores state law relative to measuring and identifying ordinary high water width. DNR concludes that poorly defined channels are a type of channel but due to the nature of being poorly defined, the ordinary high water mark concept is not applicable (Sackett 2013).

**Response:** DNR’s method of stream typing is described in forest practice rules and the HCP. As stated in the cited memo (Sackett 2013):

“...the measurement protocol is the same for all streams having a defined channel. The definition for Type 2 and 3 waters states ‘defined channel,’ whereas the definition for Type 4 water states only ‘channel.’ The definition for type 5 water states ‘with or without well-defined channels;’ this is the only typed water definition where the definition includes consideration of channels that are not well defined.”

Stream typing methods are not addressed through this forest land planning process.

**No.: 177**

**Topic: Mistyping Streams in the Field**

**Source: Don Hamerquist and Janeen Porter, pages 151 and 152; Mike Haggerty, OFCO, pages 19 through 23**

DNR systematically mistypes a significant number of Type 3 or 4 channel segments which must be buffered. These streams are mapped as Type 5 water or as “not channels” which receive less protection, in many cases none at all.

Field-based stream typing issues can be categorized into three categories: [1] Type 3 water upstream of Type 4 or 5 water, [2] Type 3 water terminating at the end of well-defined channels, and [3] application of Type 5 water classification to stream channels with an ordinary high water width greater than 2 feet.

DNR currently has no guidance on how to distinguish between well-defined and poorly defined channel types. It appears to be left to the call of the field forester conducting the stream typing. In addition, DNR's ability to measure ordinary high water width in the field is questionable. This results in frequent under-typing of stream channels. In one example from the field, DNR’s average channel width was less than 23 percent of the ordinary high water mark that would be measured using strict protocols. DNR's width measurements underestimated ordinary high water width, scoured width, and wetted widths at average winter-time discharges.

DNR does not use stream hydrologists or fish biologists for stream typing in the OESF. The use of qualified hydrologists and biologists would help ensure streams are correctly typed on the

ground. DNR staff also need training in stream typing and identification of ordinary high water width.

**Response:** Stream typing methods and verification and the use of hydrologists or biologists for stream typing are issues specific to the implementation of individual timber sales; such issues were not addressed through this forest land planning process.

As part of its HCP commitments, DNR conducts implementation monitoring of individual timber sales. Refer to the 2007 Implementation Monitoring Report (DNR 2008) for a discussion of implementation monitoring of the riparian conservation strategy in the OESF: [http://wa-dnr.s3.amazonaws.com/publications/lm\\_hcp\\_im\\_report2007.pdf](http://wa-dnr.s3.amazonaws.com/publications/lm_hcp_im_report2007.pdf).

**No.:** 178

**Topic:** Adverse Impacts of Mistyped Streams

**Source:** Don Hamerquist and Janeen Porter, page 152; Mike Haggerty, OFCO, page 22

OFCO has exhaustively documented the undertyping of Type 3 and 4 streams as Type 5 in units of the current “Stumpy’s Ride” and “Clallam Combined” harvests, and can provide uncontroverted photographic evidence that this practice has resulted in sediment delivery to typed waters in clear violation of state clean water standards. These impacts are significant and adverse. The Clallam Combined forest practices application did not map the stream at all. The Stumpy's Ride forest practices application mapped the stream as a Type 5 (labeled stream 5x) up to the edge of the harvest unit. When right-of-way timber harvest was conducted for the Clallam Combined forest practices application Unit 4, road conditions were highly degraded and sediment and sediment-laden waters were routed into this stream. At the downstream end of the road, crossing turbidity readings averaged 978 nephelometric turbidity units (NTUs), while the background turbidity in the downstream receiving water was 5 to 6 NTUs (stream 5W; see Haggerty 2013).

**Response:** Stream typing methods and verification are issues specific to the implementation of individual timber sales; such issues were not addressed through this forest land planning process.

As part of its HCP commitments, DNR conducts implementation monitoring of individual timber sales. Refer to the 2007 Implementation Monitoring Report (DNR 2008) for a discussion of implementation monitoring of the riparian conservation strategy in the OESF: [http://wa-dnr.s3.amazonaws.com/publications/lm\\_hcp\\_im\\_report2007.pdf](http://wa-dnr.s3.amazonaws.com/publications/lm_hcp_im_report2007.pdf). Refer to Comment 171 for more information on stream typing.

**No.:** 179

**Topic:** Stream Width Data

**Source:** Chris Mendoza, OFCO, pages 85, 86, and 89

Based on the fact that Type 4 waters are, by definition under the HCP, channels that are greater than 2 feet wide at ordinary high water mark, and therefore being incorrectly identified as Type 5 streams, the Conservation Caucus requested that DNR provide the channel width data from the

streams included in both DNR’s compliance monitoring program and the “Retrospective Analysis of the Trust Lands HCP Interim Type 5 Conservation Strategy.” We made this request after DNR’s 2009 presentation to the Conservation Caucus on the headwaters conservation strategy, and on multiple occasions over the past three years.

Based on DNR’s 2009 presentation, DNR’s Type 5 retrospective analysis collected a myriad of other channel profile data (for example, channel gradient, channel substrate composition, channel depth, pool frequency, etc.), so it stands to reason that field crews must have also collected channel width data, particularly since they were by definition conducting a “Type 5” analysis. The Conservation Caucus has yet to receive any data from DNR on channel attributes (for example, channel width) from either of these projects.

Instead, DNR provided a critique of the Conservation Caucus’ comments on the Type 5 retrospective analysis 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 analysis when channel width is the defining criteria in the HCP for defining Type 5 waters. Please, send the Conservation Caucus the data.

**Response:** DNR’s 2006 “Retrospective Analysis of the Trust Lands HCP Interim Type 5 Conservation Strategy” is outside of the scope of this forest land plan and RDEIS.

**No.:** 180

**Topic:** Desired Future Condition

**Source:** Fawn Sharp, Quinault Indian Nation, page 5

We recommend that DNR define a desired future condition for riparian areas. More discussion of DNR’s concept of managing riparian ecosystems for habitat complexity versus a desired future condition is needed. We contend that natural disturbances and natural variability in stream attributes will cause sufficient habitat variability within a riparian area managed for a desired future condition.

**Response:** A primary benefit of using an explicit riparian desired future condition (DFC) is that it provides a convenient means of assessing progress toward achieving a given vision or goal. In this capacity, DNR incorporated a DFC into its riparian impact analysis. For the FEIS, both large woody debris recruitment potential and leaf and needle litter recruitment potential are calculated as a percentage of what would be provided by a stand that meets the DFC specified in DNR’s 2006 *Riparian Forest Restoration Strategy*.

However, the vision for the riparian conservation strategy for the OESF is to protect, maintain, and restore habitat capable of supporting viable populations of salmonid species and other non-listed and candidate species dependent on instream and riparian environments. The OESF riparian conservation strategy seeks to achieve this vision not by protecting an idealized set of conditions (in other words, a riparian DFC), but instead by conserving habitat complexity as afforded by natural disturbance regimes on the western Olympic Peninsula.

It is important to note that a range of watershed conditions is desirable. A key principle of managing riparian ecosystems for habitat complexity is to focus on natural processes and variability, rather than attempting to maintain or engineer a desired set of conditions through time (Lugo and others 1999, Dale and others 2000 as cited in Bisson and Wondzell 2009).

DNR submits that it is possible to measure progress toward its vision for the riparian conservation strategy without resorting to the use of a DFC. DNR assesses a suite of riparian and watershed parameters to calculate a watershed score for each Type 3 watershed. DNR examines the distribution of watershed scores for all Type 3 watersheds in the OESF and assesses how that distribution changes over time. DNR is not working toward a set threshold for the number of watersheds in a specific condition. Rather, DNR's objective is to achieve a range of conditions that provide habitat variability and complexity. The USFS utilizes the same technique to assess watershed conditions under implementation of the Northwest Forest Plan (Gallo and others 2005).

**No.: 181**

**Topic: Use of Surrogate Versus Empirical Data**

**Source: Fawn Sharp, Quinault Indian Nation, pages 3 and 4**

The models used to evaluate the alternatives are based on surrogate data that do not necessarily reflect on the ground negative ecological impacts. For example, stream temperature is not added into the model, and therefore, the model does not accurately depict water quality results. The analysis should include current empirical data rather than theoretical surrogate data. The riparian, fish habitat, and water quality models and analysis should be based on real empirical data to ensure the protection and recovery of treaty right protected organisms.

Numerous data are available and should be incorporated into the model. A significant and usable dataset for stream temperature does exist in the Queets River watershed and should be used instead of surrogates. Moreover, these data indicate widespread impairment; numerous streams are not meeting state water quality standards and qualify for listing as impaired under Section 303(d) of the Clean Water Act. It is likely that logging activities have contributed to these impairments and related pollution to waters.

Because the RDEIS relies on surrogates of water temperature when real data exist that show widespread impairment, the Quinault Indian Nation questions DNR's conclusion that the No Action and Landscape Alternatives have a "medium" impact to streams. The Quinault Indian Nation does not agree that neither alternative will have probable significant adverse environmental impacts on water quality.

**Response:** DNR's conclusion that the No Action and Landscape alternatives have a medium impact to streams is based on an analysis of stream shade as a surrogate measure for stream temperature. DNR did not measure stream temperature directly, or use temperature measurements as input to its analysis. Instead, DNR relied on published nomographs (relationships between shade and temperature) to make predictions about the stream temperature that would result from a given level of shade. The use of

surrogates as indicators of ecological function or habitat quality is well established (Murtaugh 1996, National Research Council 1986, Noss 1990, Messer and others 1991).

DNR’s strategy for meeting state water quality temperature standards is to retain a forested buffer along streams to shield them from an increase in solar radiation. The width of the buffers under DNR’s riparian conservation strategy are consistent with those suggested in scientific literature as sufficient to maintain suitable stream temperatures.

Documented occurrences of water temperature exceedances in areas where stream buffers were applied in accordance with DNR’s conservation strategy warrant further investigation, and are best addressed through DNR’s research and monitoring program and adaptive management process.

The commenter’s statement of widespread water temperature impairments in the Queets River watershed is based on a data set collected in 2013, after DNR had completed its riparian analysis for the RDEIS. As described in the materials submitted with the public comments:

“Eighty-nine (89) total project thermistors were installed in 2013. Eighty-seven (87) of the eighty-nine (89) thermistors logged sufficient data to compute station 7DADM value. Sixty (60) of the 87 units (68.9%) with 7DADM values were determined to fail either the 12° C or 16° C criteria by at least 0.4° C. Another 3 of the 87 thermistors were determined to have 7DADM values that were within the accuracy specifications of the thermistors (+/- 0.3° C).”

The thermistors (temperature sensors) were installed across a variety of ownerships. Of the 63 that indicated stream temperatures in excess of state water quality standards (3 of which were within the margin of error of the thermistors), it appears that 14 were located on DNR-managed streams.

In 2012, DNR initiated a riparian status and trends monitoring project in the OESF, including continuous stream temperature monitoring and calculation of 7DADM. DNR’s monitoring includes 23 sample basins in the Queets River watershed, although none are coincident with the sites monitored by Quinalt Indian Nation. More information on the riparian status and trends monitoring project can be found at the following link: <http://www.dnr.wa.gov/programs-and-services/forest-resources/olympic-experimental-forest/ongoing-research-and-monitoring>.

**No.: 182**

**Topic: Riparian Management, Compliance Monitoring**

**Source: Coleman Byrnes, pages 1 and 2**

The riparian section has a lot of impressive graphs and equations. But when one looks beyond the smoke and mirrors, one sees an attempt to decrease riparian protection. LEAVE THE RIPARIAN VEGATATION ALONE. It is too important. It is important not only for fish and aquatic organisms but for most other forest ecosystem vertebrates as well. It is ridiculous to think that someone sitting in front of a computer at a desk in Olympia can make valid decisions concerning

riparian management. Stream typing and riparian delineation needs to be ground-truthed and the personnel that perform this task have to be trained to do the job properly. In other words, on-the-ground monitoring is needed. Too many people out of the Forks office mistype streams. In addition to biological function, the riparian vegetation has an important role to play in managing the hydrological regime of the watershed that they are a part of. Stay out of the riparian vegetation.

**Response:** The HCP allows forest management activities within the riparian area, provided those activities are consistent with the objectives of the riparian conservation strategy.

In the RDEIS, DNR analyzed the locations, timing, and intensity of harvest proposed under either alternative and concluded that neither alternative would result in probable significant adverse environmental impacts to riparian function. In addition, each timber sale is subject to a SEPA review process prior to implementation. Any significant impacts identified through these processes must be mitigated in order for a timber sale to occur.

DNR will conduct monitoring as part of implementing the forest land plan, and will use the information gathered through monitoring as well as research to evaluate potential changes in management through the adaptive management process. Refer to Chapter 4 of the draft forest land plan (Appendix A to the RDEIS) for a full discussion on these topics.

For a summary of recent implementation monitoring of the riparian conservation strategy in the OESF, refer to the 2007 Implementation Monitoring Report (DNR 2008): [http://wa-dnr.s3.amazonaws.com/publications/lm\\_hcp\\_im\\_report2007.pdf](http://wa-dnr.s3.amazonaws.com/publications/lm_hcp_im_report2007.pdf).

**No.:** 183

**Topic:** Representation of the 100-year Floodplain

**Source:** Mike Haggerty, OFCO, page 32

The method used to represent the width of the channel and 100-year floodplain in the riparian impact analysis is flawed. In its analysis, DNR applied a standard size for each stream type: Type 1 = 300 feet, Type 2 = 120 feet, Type 3 = 30 feet, and Type 4 = 7.5 feet. This method is prone to numerous errors at the reach scale. Type 1 streams can vary from large rivers to medium sized streams with confined valleys. The channel of the upper Clallam River, for example, is approximately 45 to 60 feet wide. The river is confined and the 100-year floodplain is less than 100 feet wide. In this example, DNR's method overestimates the width of the channel and 100-year floodplain by at least 200 feet. For some Type 3 streams, such as lower Blowder Creek, the width is greater than 30 feet; whereas a very small, confined Type 3 stream might only be 5 feet wide.

A model linking bankfull width to contributing basin and channel confinement could have been used to more accurately reflect the expected width of the 100-year floodplain.

An analysis of reach-scale impacts requires an accurate determination of the area of influence for each riparian indicator and an accurate mapping of the 100-year floodplain for typed waters. This is not possible in the OESF.

**Response:** While DNR concurs that detailed mapping of the 100-year floodplain is preferred, no such data exists in a comprehensive and readily available form for the OESF. DNR’s method of applying a standard size floodplain to each stream type was used to address the lack of data. DNR believes this method is consistent with SEPA rules outlining the circumstances under which an agency may proceed with an analysis of significant adverse environmental impacts when faced with incomplete or unavailable information (WAC 197-11-080).

**No.:** 184

**Topic:** Terrestrial Riparian Habitat

**Source:** Mike Haggerty, OFCO, page 32

DNR’s method of calculating a watershed-level impact score does little to evaluate the impacts around the (terrestrial) habitat within the riparian area

**Response:** For its riparian analysis, DNR evaluated conditions within streamside forests based on their ability to influence instream conditions. Terrestrial habitat is analyzed in “Wildlife” in the RDEIS and FEIS.

**No.:** 185

**Topic:** Watershed-level Reporting of Impact Analysis

**Source:** Mike Haggerty, OFCO, page 32

DNR’s method of reporting a watershed-level impact score as a length-weighted sum of reach-level impact scores makes it difficult or impossible to evaluate changes to actual fish habitat.

**Response:** DNR did not include reach-level results of the riparian and fish analyses in the RDEIS. Instead, DNR summarized the results of its riparian impact analysis at the watershed level for two primary reasons.

The first reason was to ensure the analysis was in keeping with DNR’s HCP, which states that “the objectives of the OESF riparian conservation strategy are to maintain and aid restoration of riparian function at the watershed scale, rather than at the site-specific level. Implementing these objectives, therefore, requires an evaluation procedure by which the aquatic and streamside conditions at a given site can be assessed in relation to the known influences of physical, biological, and land-use factors throughout the watershed. 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.” (DNR 1997, p. IV.127).”

The second reason was to reduce to volume of data to a manageable level more easily understood by the reader. DNR concluded that publishing reach-level results would be untenable. The reach-level results exceeded 2.8 million data points (20,577 stream reaches x 7 riparian indicators x 2 alternatives x 10 decades). Including results at that

level of detail would not be in keeping with WAC 197-11-425(2) of SEPA, which directs that environmental impact statements shall be concise, written in plain language, and not excessively detailed or overly technical.

While data on individual stream reaches is not included in the RDEIS, the fish analysis presented in Chapter 3 does report impacts by total stream miles and as a proportion of essential fish habitat. In addition, DNR provided a 214-page table (Table G-36 of Appendix G to the RDEIS) which summarized all riparian indicators by alternative and decade.

For the DEIS, DNR presented detailed results of its riparian impact analysis in a 4,802 page appendix and received numerous public comments that the document was overly long and unreadable. The more concise summary presented in the RDEIS was intended to address these concerns.

**No.:** 186

**Topic:** Length Weighting

**Source:** Mike Haggerty, OFCO, page 32

DNR calculates a watershed-level impact score as a length-weighted sum of reach-level impact scores. A weighting method based on habitat area is preferred and would better reflect the amount of habitat found in each reach.

**Response:** DNR has updated its analysis methodology for the FEIS. In calculating the watershed-level impact score, each stream reach was weighted by its area (length x width) instead of its length.

**No.:** 187

**Topic:** Distance Weighting

**Source:** Mike Haggerty, OFCO, page 34

DNR's method of applying distance weighting in its reach-level riparian impact analysis is flawed. DNR used distance-weighting factors that correspond to an analysis area of 170 feet, but the actual area being examined is only 150 feet. The distance weights should sum to 1 (DNR's weights sum to 0.963), and the weight for each zone should account for its relative contribution within the total area examined (150 feet not 170 feet). DNR's distance weighting factors of 0.599, 0.150, and 0.214 for the "75i," "100i," and "150i" zones, respectively, are in error. The corrected distance weighting factors are as follows: "75i" =  $0.599/0.963 = 0.622$ ; "100i" =  $0.150/0.963 = 0.156$ ; and "150i" =  $0.214/0.963 = 0.222$ . This error is so significant that it undermines the entire riparian impact analysis. The analysis is fatally flawed and must be redone using the correct formulas. This flaw applies to all portions of the assessment that use reach-level scores and distance-weight multiplied by area weight.

**Response:** For its analysis of large woody debris in the RDEIS, DNR used source distance relationships developed by McDade and others (1990) to calculate the relative contribution of selected distance intervals along each stream segment. DNR conducted its analysis assuming a site potential tree height of 170 feet. With this assumption, the

20-foot-wide interval between 150 and 170 feet accounts for 3.7 percent of total large woody debris recruitment.

To simplify geoprocessing calculations in the riparian impact analysis, and to best align with the spatial data set used in the forest estate model, large woody debris recruitment from beyond 150 feet was not analyzed. Only the area within 150 feet of and including the 100-year floodplain was analyzed. All subsequent calculations were performed such that the area within 150 feet of, and including, the 100-year floodplain could contribute (at most) 96.3 percent of large woody debris recruitment. DNR’s estimate is therefore conservative. By ignoring any potential contribution of large woody debris from the area located between 150 and 170 feet of the 100-year floodplain, DNR slightly underestimates large woody debris recruitment and slightly overstates the level of impact. The use of the weighting factors suggested by the commenter would effectively attribute all large woody debris recruitment to the innermost 150 feet, ignoring the contribution of the outermost 20 feet.

For the FEIS, DNR modified its method of analyzing riparian indicators whose ability to influence instream function varies with distance from the stream channel. The analysis was updated to include all areas within 200 feet of the 100-year floodplain, sub-divided into 25-foot wide distance bands. The distance weighting factors used in the RDEIS were replaced with an explicit calculation of the probability of a stand in each distance band to provide riparian function based on published (McDade and others 1990, FEMAT 1993) source-distance relationships.

**No.: 188**

**Topic: Area Weighting**

**Source: Mike Haggerty, OFCO, pages 34 and 35**

DNR’s method of applying area weighting to its reach-level riparian impact analysis is flawed. At the reach scale, if the areas within the three analysis zones (“75i,” “100i,” “150i”) are proportional to the distance-weighted zones, there is no need to apply area weighting when calculating the reach-level potential score. In situations where the area analyzed is not proportional to the distance-weighted zones, the correct formulas for area weighting each zone are:

$$AreaWtZone150i = \frac{\left(\frac{Area75i + Area100i + Area150i}{Area150i}\right)}{0.333}$$

$$AreaWtZone100i = \frac{\left(\frac{Area75i + Area100i + Area150i}{Area100i}\right)}{0.167}$$

$$AreaWtZone75i = \frac{\left(\frac{Area75i + Area100i + Area150i}{Area75i}\right)}{0.5}$$

The method of area weighting, as done in the RDEIS, produces erroneous results that negate the validity of the entire riparian analysis. This error is so significant that it undermines the entire

riparian impact analysis. The analysis is fatally flawed and must be redone using the correct formulas. This flaw applies to all portions of the assessment that use reach-level scores and distance-weight multiplied by area-weight.

**Response:** DNR conducts its riparian analysis by examining conditions within the “area of influence”: the area adjacent to each stream reach that, due to its proximity to the stream, is considered capable of influencing instream conditions. Because DNR tracks various attributes within this area using an overlay of multiple GIS layers, the area often consists of a multitude of GIS polygons. Each polygon is examined separately and assigned a score, and the scores for all polygons within the area of influence are combined to form a reach-level assessment. To accurately assess reach-level conditions, the process of combining the scores of individual polygons must account for variations in their size through area weighting. DNR must also take into account the location of each polygon, since riparian function declines with distance from the stream channel. For the RDEIS, DNR used distance-weighting factors (the subject of this comment). For the FEIS, DNR updated its analysis methodology by replacing distance weighting factors with an explicit calculation of the probability of a given polygon to provide riparian function based on published (McDade and others 1990, FEMAT 1993) source-distance relationships.

For the RDEIS, DNR’s calculation was a two-step process. First, an intermediate value, which DNR calls the “preliminary distance and area weighted sum,” was calculated. The details of the calculation are described in Appendix G, page G-33. The distance-weighting incorporated into the intermediate value assumes a uniform width of the analysis area (Breipohl 1970, as cited in McDade and others 1990). For the reasons described below, this assumption does not hold, and accordingly, DNR’s calculation involved an additional step.

Because of the complexity of the GIS overlay, the width of a polygon often varies with distance from the stream. To account for such variations, DNR used a second step in the calculation to normalize the intermediate value based on the minimum and maximum value possible given the spatial configuration of the area of influence. This additional step was described in Appendix G, page G-34, using equation G-10. This additional step addresses the concern raised by the commenter for situations where “the area analyzed is not proportional to the distance-weighted zones.” For additional detail, refer to equation G-10, Appendix G, p. G-34.

The method of area-weighting suggested by the commenter is simpler than the one DNR used and has merit. However, DNR believes that the numerator is inverted in the equation suggested by the commenter. That is, to calculate the area weighting for a zone (j) the commenter suggest the equation is:

$$AreaWtZone_j = \frac{\left(\frac{\sum Area}{Area_j}\right)}{\left(\frac{\sum Width}{Width_j}\right)}$$

DNR submits that the equation is:

$$AreaWtZone_j = \frac{\left(\frac{Area_j}{\sum Area}\right)}{\left(\frac{Width_j}{\sum Width}\right)}$$

**No.: 189**

**Topic: Invasive Species**

**Source: Fawn Sharp, Quinault Indian Nation, page 5**

Except for two brief responses to a general comment (Appendix B, “Scoping Notice and Response to Scoping Comments,” p. 12; and Appendix L, “Summary of Comments on 2010 DEIS,” p. L-30) the RDEIS fails to discuss the potential impacts caused by non-native, invasive species. Such an analysis is warranted. The causes of the spread and transmission of invasive species need to be addressed in ecological terms, with binding solutions enacted, to prevent the spread and transmission of invasive species and to detect and treat invasive species where they are known or suspected to exist. Specifically, the RDEIS fails to address the potential impacts of multiple species of knotweed to ecological values and forest production.

Knotweed infestations are known to kill Sitka spruce, western hemlock, and red alder seedlings. These tree species are common to the riparian zones, wetlands, and floodplains of the OESF. Widespread knotweed infestations may adversely impact a multitude of ecologically-based activities and resources, and the Quinault Indian Nation has been detecting and treating knotweed infestations in water resource inventory area 21 since 2008. The Quinault Indian Nation has confirmed almost 31 river miles of knotweed in the Queets River watershed and is treating these areas. The most upstream infestation originated on DNR-managed lands in the OESF near the confluence of the Clearwater and Sollecks rivers, extending downstream to the Clearwater River to the Queets River and then to the Pacific Ocean.

Knotweed is easily spread by heavy equipment. Small pieces of the plant become lodged in the tracks and are spread as equipment moves from one site to another. Once present in a riparian area or floodplain, knotweed spreads easily and rapidly downstream by flowing water. Left unchecked on the OESF over the 100-year time frame of the forest land plan, knotweed will expand and take over riparian habitat, kill native tree seedlings, and convert riparian zone stands of trees that presently provide the shade necessary to maintain cool water temperatures.

The RDEIS fails to analyze the threat knotweed poses to the documented and widespread impaired water temperatures observed in the Queets River watershed (and possibly elsewhere). Further, the RDEIS fails to examine other potential adverse ecological impacts from knotweed such as competition with or conversion of native, culturally important plants, or the overtaking of important wildlife habitat along rivers needed by elk and other animals.

DNR needs to incorporate information on knotweed in the RDEIS, examine the potential adverse impacts of knotweed on multiple ecological-based values, discuss what measures are in place (contractual, binding, or desired) to ensure that further spread of knotweed does not occur, and

make provisions to detect and treat areas that are either known or suspected to be impacted by knotweed.

**Response:** DNR did not include an analysis of knotweed in the RDEIS. Neither alternative includes changes to DNR’s existing procedures for controlling either invasive plants or noxious weeds on forested state trust lands.

As part of the SEPA checklist completed for each timber sale, DNR is required to list all noxious weeds and invasive species known to be on or near the site of proposed forest management activities. In addition, DNR is directed under PR 14-006-050, *Controlling Invasive Plants and Noxious Weeds*, to participate in control efforts for invasive plants and noxious weeds in concert with or in support of county and other governmental authorities. As budgets and staffing allow, DNR may participate in other types of cooperative partnerships that address invasive species and/or noxious weeds in an integrated manner across ownerships.

DNR is a member of the Olympic Knotweed Working Group, a consortium of about 20 government agencies, tribes, non-profits and private landowners working to eliminate knotweed from waterways on the Olympic Peninsula. DNR has also allowed other organizations to treat knotweed on state trust lands.

**No.: 190**

**Topic: Riparian Land Classification**

**Source: Mike Haggerty, OFCO, pages 26 and 27**

Table 3-10, “Acres of State Trust Lands in the OSEF by Landscape and Land Classification,” on page 3-32 of the RDEIS does not accurately represent the riparian land classification by alternative. The area located between 100 and 150 feet along Type 3 streams for the No Action alternative is not shown in the table for comparison. This area comprises an estimated 6,000 to 7,000 additional acres and accounts for approximately 10 percent of the riparian area within the riparian land classification. The same error is found in the charts presented in Appendix E, “Forest Conditions and Management.” The riparian area is not the same for both alternatives. The RDEIS should be changed to reflect the difference between alternatives.

**Response:** The analysis model divides the OESF into two land classes: “riparian” and “uplands.” The riparian land class was based on specifications from the HCP. It includes potentially unstable slopes or landforms, wetlands, floodplains, and an additional interior-core buffer whose width varies by stream type. All other areas were classified as uplands.

The riparian impact analysis used in the RDEIS examines a somewhat different area. Instead of analyzing the riparian land class, it analyzed the area in which each indicator is expected to have an influence on the stream channel. This “area of influence” was based on a review of scientific literature. For example, large woody debris recruitment generally takes place within one tree height of the stream channel (McDade and others 1990, FEMAT 1993).

Since the area of influence was defined differently than the riparian land class, summaries of conditions within these areas will vary depending on which classification was used. In some cases, the riparian land class is larger than the area of influence; in other cases, it is smaller.

For example, in keeping with Table IV.5 of the HCP, along Type 3 streams the riparian land class extends 100 feet outward from the 100-year floodplain. Any area beyond 100 feet is considered part of the uplands land class. However, a portion of this area is within one tree height of the stream channel and does, in fact, have an influence on instream large woody debris recruitment. For the FEIS, the large woody debris area of influence incorporates all areas within 200 feet of, and including, the 100-year floodplain, and as such, includes both the riparian land class and portions of the uplands land class.

DNR recognizes that its use of two similar terms (riparian land class, and riparian area of influence) for different areas in the RDEIS has caused confusion. For the riparian analysis in the RDEIS and FEIS, DNR included a description of the area analyzed for each indicator. Also for the FEIS, DNR removed the riparian land class discussion from “Forest Conditions and Management.” DNR removed this information because impacts to riparian areas are analyzed in “Riparian.”

**No.: 191**

**Topic: Riparian Area**

**Source: Mike Haggerty, OFCO, page 27**

The Landscape Alternative appears to protect 29,216 fewer acres of riparian habitat described in the HCP. The riparian area for the Landscape Alternative measures 69,532 acres, calculated by summing the 1) assumed channel and floodplain width, 2) an area measuring 150 feet on either side of Type 1 and 2 streams and 100 feet on either side of Type 3 and 4 streams, and 3) unstable slopes. This contrasts with the 98,747 acres expected under the HCP, calculated by including average-width exterior buffers to the above total.

**Response:** DNR respectfully submits that the commenter’s calculation above is in error for three reasons. First, it overestimates the extent of riparian buffers required in the HCP. Exterior buffers are not required on all streams, only on those streams for which wind firmness cannot be documented by historical information, windthrow modeling, or other scientific means (DNR 1997, p. IV.117). The calculated value of 98,747 acres therefore overestimates the extent of riparian habitat by assuming exterior buffers are applied to all riparian segments. Secondly, the calculated value of 69,532 acres for the Landscape Alternative does not include any exterior buffers. Along segments of the interior-core buffer that have the potential for severe endemic windthrow, DNR will either apply an 80-foot exterior buffer or reconfigure the shape and orientation of the harvested edge, distribution of leave trees, or both to reduce severe endemic windthrow risk. Lastly, some riparian areas may receive additional protection because they are located within areas that are deferred from harvest. These areas were not included in the commenter’s calculation.

**No.:** 192

**Topic:** Peak Flow

**Source:** Mike Haggerty, OFCO, pages 8 and 9

The impact analysis of peak flow is inconsistent with the measurable objective stated in the forest land plan. The measurable objective is to prevent detectable increases in water quantity (peak flow) during storm events. However, this is not what the analysis evaluates. The RDEIS evaluates the potential for changes in peak flow within each Type 3 watershed and assigns a numerical score from 1 to 3. A score of 3 indicates a less than 10 percent increase in peak flow (the detection limit). Any score less than 3 indicates a detectable (that is, 10 percent or greater) increase in peak flow. Since the peak flow sensitivity rating assigned to each stream reach is held constant, any decline in the stream reach score also indicated a detectable increase in peak flow.

To be consistent with the measurable objective, the potential score should never decline. A declining potential is a detectable increase in peak flow and a failure to meet the conservation objective. Such a decline occurs in Type 3 watershed #102. The watershed-level peak flow impact score indicates a 13.5 percent increase in peak flow occurs in Decade 5, yet the impact is rated very, very low.

Furthermore, the model DNR used in its analysis only examines one variable to determine changes in peak flow and is unlikely to detect other factors that can influence changes in peak flow, such as roads.

**Response:** DNR assigned a numerical score (the “peak flow potential rating”) to the percent change in peak flow projected for each watershed under each alternative for each decade. The peak flow potential rating is assigned using a mathematical construct known as a “fuzzy curve,” which has been suggested by several authors (Openshaw 1996, Saliski and Sperlbaum 1991 as cited in Reeves and others 2004) as a means of dealing with ecological complexity. Fuzzy curves are especially applicable to categorizing states or conditions of ecosystems, which typically have no arbitrary point at which “fair” conditions give way to “good” conditions. Instead, DNR submits that a gradient exists where “fair” transitions into “good.” This vague transition or gradient is what a fuzzy curve is intended to represent.

DNR developed its fuzzy curves based on the professional judgement of its scientific staff and a reading of the scientific literature. As recommended by Grant and others (2008), a 10 percent increase in peak flow is considered the minimum detectable change. Changes in peak flow below this level are within the experimental and analytical error of flow measurement and cannot be ascribed as a treatment effect (Grant and others 2008). DNR modified the fuzzy curve used in the FEIS to be rather conservative. Changes in peak flow less than 5 percent were assigned a score of 1 (the highest score, indicating “good” condition); a change in peak flow at the detection limit of 10 percent was assigned a score of 0.5 (a neutral score); and changes in peak flow greater than or equal to 15 percent were assigned a score of 0 (the lowest score, indicating a “poor” condition).

DNR's analysis of peak flow considers multiple parameters at the stand, reach, and watershed levels. The potential for detectable increases in peak flow within each watershed is based on the proportion of hydrologically immature forests the watershed contains. Hydrological immaturity is assessed through an examination of stand age and density. Each hydrologic zone within each watershed is evaluated separately, as the peak flow response varies by zone. All areas without vegetation, such as roads, are included in the analysis and are classified as hydrologically immature.

The impact analysis considers not only the magnitude of the detectable increases in peak flow, but also the expected channel response to such changes. The channel response, or sensitivity, is based on the confinement and gradient of each stream reach.

**No.: 193**

**Topic: Methodology for Assessing Large Woody Debris Recruitment Potential**

**Source: Mike Haggerty, OFCO, page 36**

The large woody debris recruitment potential ratings used in DNR's analysis of riparian function do not accurately represent riparian forests or differentiate between them. For example, a large, dense, conifer-dominated stand is rated as having the same large woody debris recruitment potential as a medium, dense, mixed-species stand. The desired future condition for most riparian areas is a large, dense, conifer-dominated stand. The ability of a medium-size stand to provide large woody debris is not the same as that of a large-size stand.

**Response:** For the FEIS, DNR revised its methodology for classifying large woody debris recruitment potential. The revised classification, patterned after Haggerty and North Olympic Land Trust (2011), applies a unique rating to each forest type. Large, dense conifer stands are assigned a higher recruitment potential score than medium, dense mixed-species stand. For a description of the updated methodology, refer to Appendix G of the FEIS.

**No.: 194**

**Topic: Methodology for Assessing Large Woody Debris Recruitment Potential**

**Source: Mike Haggerty, OFCO, page 36**

DNR's method of assessing large woody debris recruitment potential is overly complex. The modeling solution is simple. DNR should assess large woody debris recruitment potential relative to a desired future condition. DNR should manage the riparian area to maximize large woody debris recruitment potential relative to the desired future condition potential.

**Response:** DNR has implemented the suggested technique as part of the riparian impact analysis for the FEIS. Using the updated technique, both large woody debris recruitment potential and leaf and needle litter recruitment potential are calculated as a percent of what would be expected from a stand meeting the riparian desired future condition as specified in DNR's 2006 *Riparian Forest Restoration Strategy* (DNR 2006b).

**No.: 195**

**Topic: Large Woody Debris Recruitment from Distances That Exceed Tree Height**

**Source: Mike Haggerty, OFCO, page 36**

The method DNR uses to assess large woody debris recruitment is flawed. It allows for recruitment by trees from distances that exceed their height. DNR’s recruitment model is based on the predicted potential of a 170-foot tall site potential tree height stand. For sub-mature and mixed-species stands, however, the recruitment potential is dependent on proximity. This is unaccounted for in DNR’s analysis.

For example, a western hemlock/Douglas-fir stand, with a quadratic mean diameter of 12 inches, and a Curtis’ Relative Density of 63, is categorized as “CMD” (conifer, medium-sized, dense) and assigned a high recruitment potential rating. However, this stand is only 100 feet tall. DNR assigns a high recruitment potential rating to this stand type, even if it is located more than 100 feet from the 100-year floodplain. The recruitment should instead be rated as low since it has no potential to provide large woody debris to the floodplain. This issue is extensive and true for many stand types across the OESF, which illustrates how DNR’s analysis of large woody debris recruitment is fatally flawed.

**Response:** The methodology for calculating the large woody debris recruitment potential rating was updated for the FEIS to correct for this issue. For the FEIS, DNR calculated the large woody debris recruitment potential for a given stand based, in part, on the probability of trees in that stand reaching the floodplain. Stands whose distance exceeds their height were assigned a probability of zero. That is, the impact analysis considered these stands unable to provide large woody debris to the floodplain.

A review of the data used in the RDEIS indicates between 2.5 and 6.4 percent of the area included in the large woody debris analysis is affected by the issue, depending on the alternative and decade in question. The overwhelming majority of affected polygons (between 92.7 and 99.6 percent by area) are located in the outermost analysis band, which lies between 100 and 150 feet from the 100-year floodplain. This partially offsets the effect of the error, since the large woody debris contribution of these polygons is diminished by the application of a distance weighting factor.

**No.: 196**

**Topic: Critique of Generic Channel Sensitivity Rating**

**Source: Mike Haggerty, OFCO, page 31**

The RDEIS continues to use a generic channel sensitivity rating based on gradient and confinement. This rating is methodologically incorrect for evaluating impacts at the reach or sub-basin scale. Multiple stream types with different sensitivities may occur within and between gradient and confinement classes. Sensitivities to inputs are directly linked to channel geomorphic units and fish habitat, 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 (Washington Forest Practices Board [WFPB] 1997). The channel analyst must interpret the dominant channel- and habitat-forming processes, and determine the stream segment’s sensitivity to each input variable (WFPB 1997). A generic sensitivity analysis has no

direct linkage between the inputs and dominant channel- and habitat-forming processes at the stream reach scale. A strictly gradient and confinement-driven assessment totally disregards fish habitat-forming processes, which is a key goal of any channel assessment. DNR’s generic sensitivity ratings do not incorporate fish habitat rule calls which, according to the standard methods for watershed analysis, should override channel sensitivity ratings. Failure to include habitat considerations in the channel sensitivity ratings calls into question the accuracy of the impact ratings for some of the most important fish habitat found in the OESF.

**Response:** DNR updated the riparian impact analysis for the FEIS to incorporate, where available, channel sensitivity ratings from watershed analyses that were performed (either completed and approved, or initiated) in the OESF per the forest practices rules. Such sensitivity ratings are linked to geomorphic units and fish habitat as described in the comment. For stream reaches where such data were not available, DNR specialists developed a generalized classification of expected channel response by reviewing the watershed analyses. Each unique combination of gradient and confinement was assigned a qualitative rating (high, medium, or low) describing its sensitivity to changes in the input of large woody debris, fine sediment, coarse sediment, and elevated peak flow. This technique is supported by the Standard Methodology for Conducting Watershed Analysis, which states: “Lacking more detailed information about stream channels, we may expect those with similar gradient and confinement to respond similarly to changes in input variables. (WFPB 1997, p. E15).”

**No.:** 197

**Topic:** Peak Flow Channel Sensitivity Rating

**Source:** Mike Haggerty, OFCO, page 9

The peak flow channel sensitivity ratings used in the RDEIS are in error. Low gradient (less than 1 percent), unconfined channels are erroneously given a low sensitivity rating. These channels are often the most productive for salmonids and can be highly sensitive to changes in peak flow. The low sensitivity rating applied to these channels in the RDEIS deviates from ratings found in watershed analyses conducted in the OESF, such as the middle Hoh Watershed Analysis (Kennard 1999) which assigns a high sensitivity rating.

**Response:** DNR updated the riparian impact analysis for the FEIS to incorporate, where available, channel sensitivity ratings from watershed analyses that were performed (either completed and approved, or initiated) in the OESF per the forest practices rules. For stream reaches where such data were not available, DNR specialists developed a generalized classification of expected channel response by reviewing the watershed analyses. Refer to Comment 196 for more information.

**No.:** 198

**Topic:** Large Woody Debris Channel Sensitivity Rating

**Source:** Mike Haggerty, OFCO, pages 25, 30, and 31

The large woody debris channel sensitivity ratings used in the RDEIS are in error. Low gradient (less than 1 percent) unconfined channels are erroneously given a low sensitivity rating. Forced pool riffle channels, which occur in streams with gradients between 1 and 3 percent, are

especially sensitive to large woody debris. When roughness elements such as large woody debris are lost, these channels can convert from a pool-riffle structure to a plane-bed structure. Such a conversion results in a significant reduction in salmonid spawning and rearing habitat and often negatively affects coho salmon habitat in small and medium-sized stream. The RDEIS assigns a medium large woody debris sensitivity rating to unconfined channels with a gradient of 1 to 2 percent. This does not make sense.

The channel sensitivity ratings used in DNR’s analysis are unsubstantiated by the references cited in the 2010 DEIS. Additional analyses, omitted in the 2010 DEIS, include comparative channel sensitivity ratings which are substantially different than those used by DNR.

**Response:** DNR updated the riparian impact analysis for the FEIS to incorporate, where available, channel sensitivity ratings from watershed analyses that were performed (either completed and approved, or initiated) in the OESF per the forest practices rules. For stream reaches where such data was not available, DNR specialists developed a generalized classification of expected channel response by reviewing the watershed analyses. Refer to Comment 196 for more information.

**No.:** 199

**Topic:** Large Woody Debris Recruitment

**Source:** Mike Haggerty, OFCO, page 25

The proposed riparian buffer widths under the Landscape Alternative are insufficient to provide adequate large woody debris to Type 3 streams. The proposed riparian buffers supply less than 75 percent of the large woody debris from areas where the site potential tree height is 170 feet, and less than 60 percent of the large woody debris where the site potential tree height is 225 feet.

**Response:** The statement that 100-foot riparian buffers would supply less than 75 percent of large woody debris for a 170-foot tall stand is consistent with the trigonometric model developed by McDade and others (1990), a study whose findings DNR incorporated into its analysis.

More recent studies suggest that McDade and others (1990) may overestimate the source area required to provide for large woody debris recruitment. Numerous authors have examined the buffer widths necessary to maintain large woody debris input to streams since the McDade study was published; these authors attribute 50 to over 95 percent of large woody debris recruitment to areas within 30 meters of the channel (Bragg 2000, Welty and others 2002, Gregory 2003, May and Gresswell 2003, Benda and others 2003, Liquori 2006). Martin and Grotefendt (2007) found that approximately 80 percent of trees that fell into Type 4 streams originated from within 10 meters (33 feet) of the bank. Johnston and others (2007) reviewed 137 source distance curves from 13 separate studies, most from coniferous forests along streams of the Pacific Coast of the United States. They report that the median source distances for 90 percent of the cumulative large woody debris volume inputs varied between 6 to 20 meters for the three dominant delivery mechanisms (bank erosion, tree fall, and landslides).

In addition, DNR expects that most Type 3 streams would likely retain forest cover beyond 100 feet. Harvest is only expected to occur along a portion of Type 3 streams in

any given decade. In addition, some Type 3 streams would also receive an exterior buffer, and areas beyond 100 feet from some Type 3 streams would be deferred from harvest as a result of implementing DNR’s other conservation strategies.

**No.: 200**

**Topic: Site Potential Tree Height**

**Source: Mike Haggerty, OFCO, page 32**

The RDEIS defines site potential tree height as 170 feet, citing the 1993 Forest Ecosystem Management Assessment Team report which described the site potential tree height as the average maximum height of the tallest dominant trees, 200 years of more in age. However, in Appendix G, “Riparian,” page G-27, the RDEIS states that the average site potential tree height is 168 feet for Type 1 and 2 streams and 165 feet for Type 3 through 5 streams at age 120, which seems to contradict the 170 foot site potential tree height used in the impact analysis. Is it assumed that trees only grow 2 to 5 feet in the 80 year period between age 120 and age 200?

The value used to represent site potential tree height greatly influences the analysis of large woody debris recruitment. For example, for a site potential tree height of 170 feet, less than 75 percent of the large woody debris is contributed by the riparian zone located 0 to 100 feet from the stream. For a site potential tree height of 225, less than 60 percent is contributed by this zone.

The 170 foot site potential tree height used in DNR’s analysis is less than what is described in the vegetation module of the North Fork Calawah Watershed Analysis, which states the site potential tree heights at age 200 along the majority of streams in the North Fork Calawah watershed range from 170 to 229 feet, with 211 feet being very common.

**Response:** For the FEIS, DNR modified the site potential tree heights used in its large woody debris and leaf and needle litter analyses to better correspond with what was described in the HCP:

“Representative site potential tree heights for each stream type were calculated by identifying streams of known type on soil survey maps registered by orthophotos, determining average site indices for growth potential from survey data for soils commonly found on stream banks and floodplains, and employing tree-height tables published by Wiley (1978). Estimated site potential tree heights for the [Olympic] Experimental [State] Forest are: for Types 1 and 2 streams, 108 feet for a 50-year growing period, 155 feet for a 100-year growing period, and 168-feet for a 120-year growing period; and for Types 3 through 5 streams, 105 feet for a 500-year growing period, 153 feet for a 100-year growing period, and 165 feet for a 120-year growing period.” (DNR 1997, p. IV.124)

Conifer stands reach the old-growth stage at about 200 years (Spies and Franklin 1988, 1991 as cited in DNR 1997, p. IV.71), which DNR assumes to represent the point at which a given stand achieves its maximum tree height. Using the tree height tables cited in the HCP (Wiley 1978) and the site index (height at 50 years breast height age) described in the HCP, the estimated site potential tree heights for a 200-year growing period are 204 feet (62 meters) for Type 1 and 2 streams, and 200 feet (61 meters) for

Type 3 through 5 streams. For the FEIS, DNR approximated these values by assuming a 200-foot site potential tree height at 200 years for all stream types in the OESF.

Accordingly, DNR expanded the “area of influence” (the area in which a given riparian function is evaluated) for its large woody debris and leaf and needle litter analyses to include all areas within 200 feet of and including the 100-year floodplain.

**No.:** 201

**Topic:** Impact Ratings

**Source:** Mike Haggerty, OFCO, pages 8, 9, and 25

DNR’s method for assigning impact ratings is flawed. Under DNR’s methods, channels assigned a low sensitivity rating can never experience a high impact regardless of changes in riparian forest condition. For example, DNR assigns a low large woody debris sensitivity rating to low gradient (less than 1 percent), unconfined channels. The riparian forest can be completely removed, changing from optimal (a potential rating of 3) to poor (a potential rating of 1). The resulting impact rating would be calculated as 49.9 (out of 100), erroneously considered a medium impact. Conversely, channels with a high potential rating can never have a low impact. This is an illogical model structure to determine whether measurable criteria are met.

In another example, the potential rating can decrease from 3 to 1.7 along channels with a medium sensitivity rating and the impact would still be rated as medium in spite of the decrease in conditions. In many cases, the ability of the riparian forest to provide large woody debris to the stream channel is reduced during the implementation period, but the impacts are not fully evaluated due to modeling and methodological errors.

Such reductions in riparian forest potential do not meet the stated conservation objective of maintaining or aiding the restoration of the riparian forest’s ability to provide large woody debris to the stream channel. The analysis methods do not address or ensure the conservation objectives are achieved. Instead, it appears that the RDEIS simply tries to make sure the final impact score is lower than the initial impact score. Forest management decisions within the forest estate model are not constrained to maximize future large woody debris recruitment potential along fish-bearing waters or aid restoration. Large woody debris recruitment potential ratings are allowed to decrease significantly during portions of the implementation period as long as they are equal to or higher at Decade 9 than they are currently.

**Response:** For the FEIS, DNR updated its methodology for incorporating the potential and sensitivity ratings into the impact analysis. The updated methodology allows for the assignment of high impacts to low sensitivity sites, as well as low impacts to high potential sites. Refer to Appendix G of the FEIS for a description of the updated methodology.

**No.:** 202

**Topic:** Mitigation for Past Harvest Practices

**Source:** Fawn Sharp, Quinault Indian Nation, page 4

Mitigation for the adverse effects of past harvest practices needs to be mandatory. Previous harvests reduced large woody debris levels, altered the frequency of mass-wasting events

(especially those associated with roads), and altered the sediment regime. Active mitigation projects related to large woody debris would support the fish habitat goals of DNR’s HCP.

**Response:** A primary objective of the DNR’s riparian conservation strategy for the OESF is to “maintain and aid restoration of the composition, structure, and function of aquatic, riparian, and associated wetland systems” (DNR 1997, IV. 107). DNR’s strategy of applying interior-core buffers to streams in the OESF is expected to benefit riparian forests by enhancing long-term recruitment of large woody debris to streams in the OESF.

**No.:** 203

**Topic:** Monitoring

**Source:** Fawn Sharp, Quinault Indian Nation, page 6

The RDEIS only considers two alternatives, each of which includes a narrow range of objectives and outcomes assessed through an abstract modeling process. However, DNR has not had the capacity to conduct thorough audit or post-monitoring assessment of its current practices, which are more conservative than those that are proposed. Therefore, the RDEIS should not be considered a final assessment of whether the conservation objectives are achieved.

**Response:** DNR will conduct monitoring as part of implementing the forest land plan, and will use the information gathered through monitoring as well as research to evaluate potential changes in management through the adaptive management process. Refer to Chapter 4 of the draft forest land plan (Appendix A to the RDEIS) for a full discussion on these topics.

DNR has previously conducted implementation monitoring of the OESF riparian conservation strategy, including stream typing. Refer to the 2007 Implementation Monitoring Report (DNR 2008): [http://wa-dnr.s3.amazonaws.com/publications/lm\\_hcp\\_im\\_report2007.pdf](http://wa-dnr.s3.amazonaws.com/publications/lm_hcp_im_report2007.pdf).

**No.:** 204

**Topic:** Failure to Meet Measurable Objectives

**Source:** Mike Haggerty, OFCO, pages 7 and 8

The RDEIS fails to meet the measurable objectives that it establishes for itself and is unacceptable as written. Neither of the two proposed alternatives in the RDEIS provides the forest management strategies and minimum environmental protections to meet the letter and intent of DNR’s HCP. The measurable objectives contained within the RDEIS do not adequately measure or represent the underlying HCP riparian conservation strategy or objectives.

**Response:** The No Action, Landscape, and Pathways alternatives meet all applicable federal and state laws and DNR policies and are consistent with DNR’s HCP.

The riparian conservation objectives for the No Action Alternative and the strategies for achieving those objectives are described in the HCP. In the draft forest land plan (Appendix A of the RDEIS), DNR described its strategies for meeting the riparian conservation objectives under the Landscape Alternative.

In the RDEIS, DNR analyzed a suite of riparian function indicators and concluded that neither the No Action nor Landscape Alternative would result in probable significant adverse environmental impacts. DNR therefore concludes that the strategies outlined for each alternative are successful in achieving the stated conservation objectives.

**No.:** 205

**Topic:** Inadequate Range of Alternatives

**Source:** Don Hamerquist and Janeen Porter, OFCO, page 151

As far as we can determine, the choices presented in the forest land plan are between the No Action Alternative, which will continue to accumulate channel segments with non-functioning riparian areas, and the Landscape Alternative, which will reduce minimum riparian buffers widths, eliminate most riparian wind buffers, and weaken site tree buffer requirements for wetlands.

**Response:** Based on its analysis of multiple indicators of riparian function, DNR concluded that neither the No Action nor Landscape Alternative would result in probable significant adverse environmental impacts to riparian areas. DNR therefore respectfully disagrees with the commenter's statement that the No Action Alternative will result in non-functioning riparian areas.

While the Landscape Alternative does allow variable retention harvest (and thinning) within the interior-core buffer, the proposed amount of variable retention harvest is small and only applied in areas not otherwise subject to deferrals. DNR's analysis presented in the RDEIS concluded that the Landscape Alternative would not result in probable significant adverse environmental impacts to riparian areas.

Under the Landscape and Pathways alternatives, DNR will use a windthrow probability model (along with remote reconnaissance and field assessments as needed) to identify segments of interior-core buffers with the potential for severe endemic windthrow. In these areas, DNR either will apply an exterior buffer or reconfigure the shape and orientation of the harvested edge, distribution of leave trees, or both to reduce severe endemic windthrow risk. DNR submits that its method of determining the need for an exterior buffer is consistent with the HCP, which only requires exterior buffers on those streams for which wind firmness cannot be documented by historical information, windthrow modeling, or other scientific means (DNR 1997, p.IV.117).

The Landscape Alternative does not change existing requirements for wetland buffers.

**No.:** 206

**Topic:** Inadequate Range of Alternatives

**Source:** Mike Haggerty, OFCO, pages 13 and 14

During the scoping process for the DEIS, DNR considered but rejected an alternative that included fixed-width riparian buffers equivalent to those proposed in DNR's HCP. The RDEIS justified the rejection of such an alternative by stating that a prescriptive approach of setting specific buffer widths based on stream type without a watershed assessment process would provide little opportunity for learning, a key attribute of integrated management. However, the

planning process (represented by the Landscape Alternative) provides little opportunity for learning. It appears to be nothing more than a fiscal tool for maximizing timber harvests and redefining riparian protections. Its impacts are evaluated using a set of models with constraints and goals that vary from the HCP.

DNR should include an alternative that incorporates prescriptive riparian protections, including Endangered Species Act “mitigations and minimizations” (described in its incidental take permits) for all Type 1 through 3 riparian areas where formal experimentation is not being conducted.

**Response:** DNR submits that the Landscape and Pathways Alternatives provide opportunities for learning. Refer to the initial list of adaptive management questions included in Chapter 4 of the draft forest land plan (Appendix A to the RDEIS). These questions are based on the working hypotheses that form the basis of DNR’s riparian and northern spotted owl conservation strategies.

The constraints and goals in the analysis model are consistent with the HCP. Refer to Appendix D, Modeling.

The interior-core and exterior buffers under the Landscape and Pathways Alternatives, including those for Type 1 through 3 streams, are consistent with the HCP and the minimization and mitigation measures of DNR’s incidental take permits. As described in Table IV.5 on page IV.58 of the HCP and in the *Reinitiation of the Biological Opinion on the Amendment of an Incidental Take Permit (PRT-812521) for the Washington State Department of Natural Resources’ Habitat Conservation Plan to Include Bull Trout* (USFWS 1998), interior-core buffers are expected to measure 150 feet along Type 1 and 2 streams, and 100 feet along Type 3 streams, on average, from the outer edge of the 100-year floodplain.

**No.:** 207

**Topic:** **Methodological Errors in DNR’s Retrospective Analysis of the Trust Lands HCP Interim Type 5 Conservation Strategy**

**Source:** **Chris Mendoza, OFCO, pages 85, 96, 97, and 98**

Many of the streams included in DNR’s retrospective analysis of the Trust Lands HCP Interim Type 5 Conservation Strategy appear to meet the physical criteria for Type 4 waters. Why were they included in a study of Type 5 waters?

DNR must first ensure that streams included in its monitoring program are correctly typed before devoting scarce public money, staff, and limited resources. This lack of critical oversight potentially undermines the credibility of DNR’s monitoring program in the OESF and on all other forest lands covered under DNR’s HCP. The absence of any form of water type validation renders the study results useless for adaptive management and forest practices application purposes. We question the usefulness of the study if there is no way to discern whether they are monitoring Type 4 or Type 5 streams.

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? The riparian functions provided by the buffers are

vastly different for Type 5 waters than Type 4 waters. The Conservation Caucus fails to see the usefulness of such studies without first validating the stream type.

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 before research and monitoring takes place, otherwise the results are useless for adaptive management purposes.

**Response:** DNR’s retrospective analysis of the interim Type 5 conservation strategy is outside of the scope of the OESF forest land plan and RDEIS.

**No.:** 208

**Topic:** Rebuttal to 2010 DNR Response to Comments

**Source:** Chris Mendoza, OFCO, pages 84, 88, 95, and 96

In March 2009, the Conservation Caucus submitted comments to DNR on their proposed Headwater Conservation Strategy following a presentation given by DNR in February 2009 titled “Retrospective Analysis of the Trust Lands HCP Interim Type 5 Conservation Strategy.” DNR responded in a January 11, 2010 memorandum from Tami Makita, then HCP implementation manager. As exemplified by DNR’s response, our concerns have been predominantly met with opposition, false assumptions, citations taken out of context, and arbitrary statements. Many of the Conservation Caucus’ comments were not adequately addressed or simply excused as inconsequential or invalid.

For example, in the 2010 memo, DNR attempted to excuse incorrect stream typing to changes in stream width post-harvest as a result of natural stream dynamics and logging disturbance. However, lacking research and monitoring results, such a claim is scientifically indefensible. Such a conclusion could only be generated from a before-after-control-impact study. DNR’s statements to the contrary, in the 2010 memo, are indicative of a complete lack of understanding of the scientific process. Research and monitoring data must be collected before any determination of causality can be made.

In its 2009 comment letter, the Conservation Caucus highlighted the importance of studies conducted by the Northwest Indian Fisheries Commission (NWIFC) (Pleus and Goodman 2003) and the Cooperative Monitoring, Evaluation, and Research group (CMER) (Palmquist 2005). In the 2010 memo, DNR was highly critical of the studies, selectively cited language out of context, and made inaccurate references and false assumptions. Most importantly, DNR’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 NWIFC (Pleus and Goodman 2003) and CMER (Palmquist 2005) studies, both peer-reviewed by the University of Washington, were relevant enough for the Washington Forest Practices Board to change the rules governing water typing under WAC 222-16-031, but not good enough for DNR staff to consider for “regulatory compliance interpretations” under the HCP.

**Response:** DNR’s proposed Headwater Conservation Strategy, the retrospective analysis of the interim Type 5 conservation strategy, and the January 2010 memorandum from Tami Makita in response to comments received from the Conservation Caucus are outside of the scope of the OESF forest land plan and RDEIS.

**No.:** 209

**Topic:** Stream Mapping Data Quality

**Source:** Chris Mendoza, OFCO, page 89 and 90

Stream length is inconsistently reported in the DEIS. A narrative accompanying Table “3-xx” in an unpublished draft of the EIS dated October 2009 states that Type 5 waters constitute about 40 percent of actual stream miles on the OESF. This estimate differs from Table 3-26 in the 2010 DEIS, which attributes 62 percent of the stream network as Type 5. The 2010 DEIS fails to explain the discrepancy in estimates of Type 5 stream length or document what changes, if any, were made to DNR’s hydro layer.

**Response:** The statement that 40 percent of stream miles in the OESF are Type 5 is from an unpublished, working draft of the DEIS. The statement, which also appears in both the DEIS (DNR 1996) and FEIS (DNR 1998) for the HCP, was used as a placeholder in the working draft of the DEIS. This statement was replaced by a summary based on more current data using a 2009 version of DNR’s GIS stream layer as shown in Table 3-26 in the DEIS (DNR 2010) and Table 3-1 in the RDEIS (DNR 2013b). DNR’s stream layer is subject to periodic updates as more accurate information is obtained.

## ■ Subject 20: Roads

**No.:** 210

**Topic:** Sensitivity

**Source:** David Montgomery, Ph.D., OFCO, page 81

DNR apparently does not assess the current influence of roads on fine sediment delivery, and simply assumes no change to the road network over time, defining little net impact. I question how this can be considered an environmental impact assessment when the assessment involves calculating an abstract traffic impact score and then explicitly avoiding consideration of the sensitivity of the receiving stream channel in evaluating the environmental impact.

**Response:** For the water quality analysis, DNR considers the potential for sediment delivery only, not the sensitivity of the stream channel to fine sediment input. DNR made this decision for three reasons. First, DNR analyzed both potential and sensitivity for fine sediment delivery in “Riparian.” Second, the water quality indicators are based on Ecology’s water quality standards. Those standards are primarily concerned with whether or not an impact is occurring, regardless of the sensitivity of the stream channel. Finally, an analysis using potential only is more conservative than one that also considers sensitivity. In the former, an impact occurs regardless of stream sensitivity. In the latter, an impact only occurs if the stream is sensitive to sediment input.

DNR assessed the influence of roads on fine sediment delivery for the No Action and Landscape alternatives by calculating traffic impact scores. Traffic impact scores are based on the fact that highly-traveled roads close to streams may cause more fine sediment delivery than less-traveled roads farther from streams. To develop traffic impact scores, DNR considers road surface type, proximity of roads to streams or other water bodies, and projected traffic levels.

DNR expects the road network to change over time. However, DNR held the road network constant because the OESF road network is already extensive, and because DNR does not expect a substantial reduction of the road network over time. Roads are essential to a working forest. Also, because the need for roads is assessed at the time of individual timber sales, it is not possible to predict at this time how many miles of road may be added (or abandoned) over 10 decades. DNR did, however, analyze the number of acres of harvest projected to occur more than 800 feet from an existing road in the first decade of the analysis period as a means to compare the alternatives. Refer to page 3-127 of the RDEIS for more information.

**No.:** 211

**Topic:** Road Density

**Source:** Marcy Golde, OFCO, pages 102 and 105

All of the landscapes exceed the Cederholm safe level of 2.5 miles per square mile. Copper Mine and Queets are double the safe level. Projected acres of harvest more than 800 feet from an existing road in first decade are high in two landscapes. The Clallam, with 1,103 acres, and Sol Duc, with 2,610 acres, appear to require significant new road building.

The HCP requires that each owner supply road maintenance and abandonment plans. This process does not cover road density issues as required in HCP items 5 and 6 on roads (build roads only where no other operationally or economically viable option exists and minimize active road density, respectively [p. IV.118]). Nevertheless, DNR has found the road maintenance and abandonment plan process fully compliant with the HCP.

**Response:** Road densities in the OESF are primarily due to topography; more miles of road are needed to navigate steep terrain than flat terrain. DNR's strategy for managing road density is to minimize new road construction to the extent possible, abandon roads when possible, and reduce the potential impacts of existing roads through road maintenance.

The HCP incorrectly cited the road density from Cederholm and Reid (1987) as 2.5 miles per square mile; the correct citation is actually 2.5 *kilometers* per square kilometer. This corrected density is equivalent to approximately 4 miles per square mile, which would be considered a high road density based on the thresholds that were developed by Potyondy and Geier (2011) and used in the analysis in the RDEIS. Note that Cederholm and Reid were describing the road density in a typical watershed, not recommending a road density.

The standards provided under forest practices rules for road construction and maintenance meet the standards provided in the HCP. Refer to Appendix C of the RDEIS for a comparison of the HCP comprehensive road maintenance plan objectives and current forest practices rules for road construction and maintenance.

**No.:** 212

**Topic:** Road Maintenance

**Source:** Marcy Golde, OFCO, page 102

Per the RDEIS, currently 144 miles of road have been well protected from erosion with decommissioning of 120 miles and approved abandonment of 24 miles out of 1,824 miles of road in the OESF. There is no indication of how they will be protected in the future, as road maintenance and abandonment plans are a onetime review and repair.

**Response:** DNR has prepared road maintenance and abandonment plans for each of the 11 landscapes in the OESF, as required by the forest practices rules. DNR has performed some road abandonment under these plans; however, DNR does not anticipate a significant amount of additional road abandonment because roads will be needed for future harvest activities.

As described on page 3-133 of the RDEIS, after work identified under road maintenance and abandonment plans has been completed, DNR will continue to inspect, maintain, and repair roads and bridges as needed using the appropriate best management practices for road maintenance and road repair identified in the current Forest Practices Board Manual and the guidance in the Forest Roads Guidebook. Refer to Appendix C of the RDEIS, page C-23, for information on DNR's road maintenance standards.

**No.:** 213

**Topic:** Road Costs

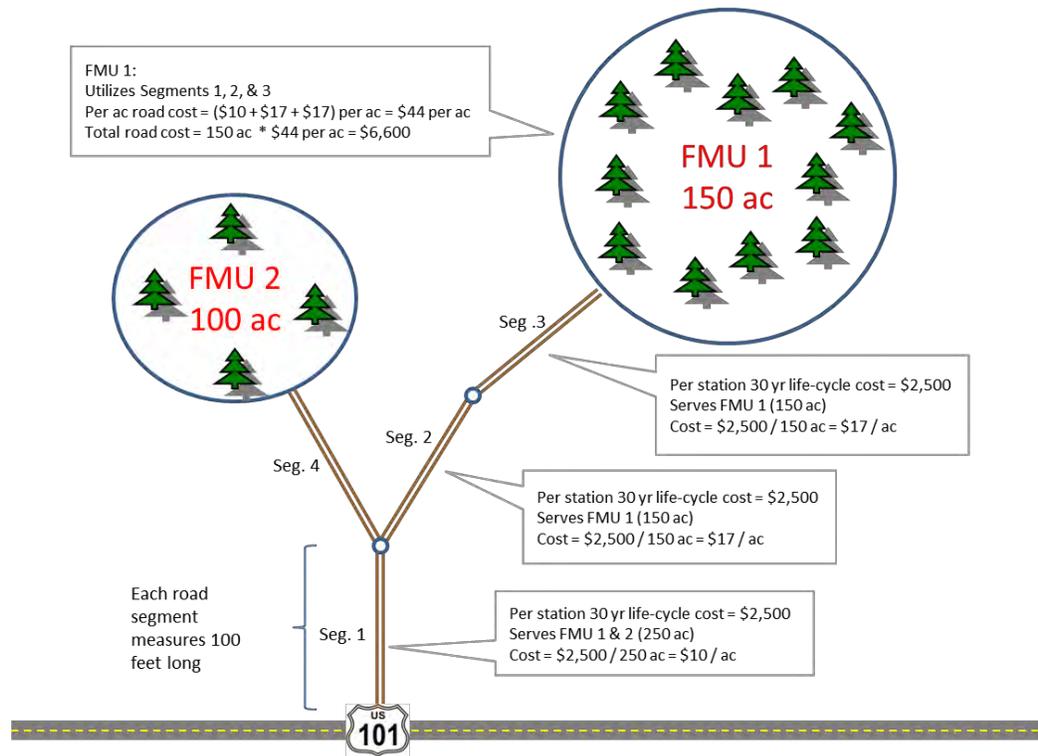
**Source:** Tom Partin, AFRC, page 9

It appears in the documentation that only existing roads were used in this calculation. If only existing roads were used, then is the “prohibitive road costs” limit due to long haul distances over road segments with extremely high replacement cost values? Can you explain how new road construction costs were accounted for in the modeling effort? Could you provide a breakdown of the figures that went into calculating the road costs? The cost per mile works out to around \$132,000 to \$237,000. Access road revolving fund (ARRF) rates were considered a “cost” when evaluating harvesting costs. If ARRF is used for maintenance of roads, should it also be considered in the replacement cost of the roads? It would seem that ARRF should help to offset the replacement cost of the road system, assuming some maintenance costs are factored into the 30-year lifespan of the road.

**Response:** To develop an “optimal solution” for producing revenue and meeting ecological objectives in the OESF, the analysis model needed information on the costs associated with harvest, including costs for road maintenance and repair. DNR developed road cost estimates for each forest management unit (FMU) in the analysis model. These estimates are based on maintenance and repair of existing roads only, not construction of new roads. From a practical standpoint, it was not possible to predict which roads would require maintenance or repair or how much it would cost. Such an analysis would have required an on-site inspection of the entire road network. Therefore, DNR used the following procedure (refer to Figure L-1).

- Using GIS, DNR divided the existing road network into segments by placing stations every 100 feet.
- DNR assigned each road segment an estimated 30-year life cycle cost. Life-cycle costs varied by landscape based on distance to rock sources, quality of available rock, and other factors.
- DNR identified the shortest route from each FMU to Highway 101.
- Along these routes, DNR determined the number of acres of FMUs that road segment accesses. If a road segment accesses only one FMU, and that FMU is 150 acres, then that road segment accesses 150 acres. If a road accesses two FMUs, and the second FMU is 100 acres, then that road segment accesses 250 acres.
- For each road segment, DNR divided the 30-year life-cycle cost of that road segment by the number of acres the road accesses. This calculation provides the road costs per acre for that segment of road.
- To arrive at the total road costs for that FMU, DNR added the costs per acre of every road segment that accessed the FMU.

Figure #L-1. Estimating Road Costs in the Forest Estate Model



These road cost estimates were used solely for modeling. They have no bearing on the actual road cost estimates DNR develops for specific timber sales.

The ARRF fees are not included in the road cost estimates in the model. DNR incorporated ARRF fees into the model as a separate cost variable.

**No.:** 214

**Topic:** Road Surface Type

**Source:** Tom Partin, AFRC, page 8

In Appendix C on page C-21, as part of the traffic impact score rating, it is unclear why the various types of unpaved road surfaces were broken out. The formula used for computing the scores appears to only differentiate between paved and unpaved. Does DNR expect variations in sediment production and/or delivery based on differences in types of unpaved road surfaces? If there are expected variations, should they be taken into account when modeling sediment delivery? It would make sense that the presence, quality of rock, size of rock, and durability of road surfaces would impact sediment production. It is also troubling that much like the 26,000+ acres of operable but unscheduled acres, there is no further investigation of the “other” road surface type and what its attributes are. Since this is the second largest group of roads, it would seem important to understand what these attributes are. This would be especially important if variations in sediment production are anticipated based on differences in unpaved road surfaces.

**Response:** The commenter is correct, in that the formula used for computing the traffic impact score considers only whether a road is paved or unpaved. The miles of road by

surface types listed in Appendix C are the result of compiling data from many different databases that did not share a common naming convention.

**No.:** 215

**Topic:** Suspension of Haul During Storm Events

**Source:** Steve Courtney, Interfor, page 3

We strongly urge DNR to utilize the first two road mitigation measures (implementing road maintenance and abandonment plans and maintaining roads) to the greatest extent practical. The alternative mitigation of suspending haul during storm events poses immediate problems from an operational perspective and would be more expensive overall to the trusts. If the maintenance and repair mitigation measures are done properly, there should be no reason to suspend haul.

**Response:** DNR suspends timber hauling on state trust lands in the OESF during storm events, when heavy rainfall can potentially increase surface water runoff and sediment delivery (unless the road is designed for wet-weather haul). The decision to suspend timber hauling on state trust lands is based on professional judgment. A weather event is considered a storm event when high levels of precipitation are forecast and there is a potential for drainage structures, such as culverts and ditches, to be overwhelmed, increasing the potential for sediment delivery to streams. Whether timber hauling is suspended or not, DNR compliance foresters monitor the haul roads to determine if potential problems are developing that may lead to sediment delivery to streams and take action as necessary.

## ■ Subject 21: Salvage

**No.:** 216

**Topic:** Salvage in Northern Spotted Owl Habitat

**Source:** Jill Silver, OFCO, pages 144 and 145

In structural habitat and Old Forest, as totally redefined in the forest land plan and RDEIS, the following management protections are vital: if the stand condition after the blowdown event continues to meet all the threshold targets required to meet the habitat definition, no salvage shall be conducted. If a stand condition after the blowdown event fails to satisfy one or more threshold targets required to meet the habitat definition, but a variable retention harvest will accelerate the stand on a trajectory toward pre-event habitat condition or better, and the biologist and state lands forester/intensive management forester concurs that such action would be advisable, the following direction applies: implement only variable retention harvest that retains optimal structural cohorts from the existing stand and, as necessary, actions associated with nurturing of existing and regeneration of new cohorts; retain all remaining live standing trees; retain large (>20 inches diameter) snags in various states of decay if present; retain large down wood (>20 inches diameter) to sustain between 10 to 30 percent ground coverage, including the five largest logs per acre; and retain at least 15 percent of the proposed activity area in an undisturbed state. In other stands, retain large (>15 inches diameter) snags in various states of decay.

**Response:** DNR’s policy for catastrophic loss prevention states that DNR will, when in the best interests of the trust beneficiaries, salvage forest stands that have been materially damaged by fire, wind, insects, or disease (DNR 2006a, p. 32). Under all alternatives, DNR will continue to follow its current procedure for salvage of down wood in northern spotted owl habitat following natural disturbance events (“Interim Direction for Addressing Blowdown in Northern Spotted Owl Habitat [Westside]”) until the 2006 Settlement Agreement expires. The 2006 Settlement Agreement expires when DNR adopts a new sustainable harvest level (currently in progress). The current procedure, which was developed as part of the 2006 Settlement Agreement, can be found in Appendix F of the RDEIS.

Once the 2006 Settlement Agreement expires:

- Under the No Action Alternative, DNR will salvage down wood after natural disturbance events on a case-by-case basis, consulting with the Federal Services as needed.
- Under the Landscape and Pathways Alternatives, DNR will follow a new procedure for salvage of down wood, including in northern spotted owl habitat, after natural disturbance events. The new procedure will provide foresters with guidelines for salvage based on the size of the disturbance and other factors. The potential environmental impacts of salvage harvests will be assessed at the time they are proposed.

## ■ Subject 22: Silvicultural Demonstration Projects

**No.:** 217

**Topic:** Inclusion of Silvicultural Demonstration Projects in forest land plan

**Source:** OFCO (summary), page iv

The forest land plan seems to have failed to include the demonstrations projects required in the 2006 Settlement Agreement, WEC vs. Sutherland, section II.A.

**Response:** DNR developed study plans for two demonstration projects in 2014 following the requirements of the 2006 Settlement Agreement (Washington Environmental Council et al v. Sutherland et al. Settlement Agreement (King County Superior Court No. 04-2-26461-8SEA, dismissed April 7, 2006)). Both study plans were peer-reviewed in the spring of 2014 and the field work started the same year.

In the first project, “The Influence of Repeated Alternative Biodiversity Thinning Treatments on Coastal Forests,” DNR is quantifying the effects of alternative pre-commercial thinning treatments and subsequent thinning on stand complexity and growth. In the second project, “Mind the Gap: Developing Ecologically Based Guidelines for Creating Gaps in Forest Thinning on the Olympic Peninsula,” DNR is assessing the effects of silvicultural practices, specifically variable density thinning and canopy gap treatments, at the stand level. In this study, DNR is evaluating vegetation and stand structure responses in and around silviculturally created gaps, and the degree to which those gaps can be made to emulate those in natural old-growth forests. More information on these projects is available on DNR’s website at <http://www.dnr.wa.gov/programs-and-services/forest-resources/olympic-experimental-state-forest>.

These two projects are funded by DNR. The Settlement Partners will continue to be briefed on the status of the projects during the regular Settlement Agreement meetings (the Settlement Partners include the Washington Environmental Council, Conservation Northwest, the National Audubon Society, Olympic Forest Coalition, American Forest Resource Council, Pacific County, Skamania County, City of Forks, Quillayute Valley School District No. 402, Toutle Lake School District No. 130, Willapa Valley School District No. 160, Pacific County Hospital District No. 2 d.b.a. Willapa Harbor Hospital, Snohomish County, Skagit County and Castle Rock School District No. 401).

## ■ Subject 23: Soils

**No.:** 218

**Topic:** Soil Compaction

**Source:** Tom Partin, AFRC, page 7

The impact ratings for soil compaction appear to be based solely on the number of harvest entries and do not seem to take into account harvest system type. No mention is made of the spatial location of these soils (for example, low gradient slopes versus higher gradient slopes) or how those locations may influence the choice of harvest system. The document states that cable systems may be used to mitigate impacts. What level of compaction impact is there, if due to slope, those portions of the analysis area are not suitable for use of ground based harvest systems to begin with? Is there any research evaluating the soil compaction differences between ground-based thinning and ground-based regeneration harvesting?

**Response:** For the soil compaction analysis, DNR assumed all future harvests would utilize ground-based logging systems. DNR felt this approach was conservative and reasonable, given that ground-based logging systems are generally used on slopes up to 40 percent steepness. Also, predicting which system would be used on which site would require a site-specific analysis of projected timber harvests. Site-specific analyses are not conducted for non-project actions. Non-project actions include the adoption of plans, policies, programs, or regulations that contain standards controlling the use of the environment, or that regulate or guide future on-the-ground actions. Future management actions depend, in part, on the decisions made in this planning process, but no specific on-the-ground activities are designed as part of this process. The site-specific impacts of timber sales are analyzed at the time they are proposed through a separate SEPA process. DNR also did not distinguish soil compaction differences between ground-based thinning and ground-based regeneration harvesting; refer to Comment 41 for more information.

**No.:** 129

**Topic:** Landslide Potential

**Source:** David Montgomery, Ph.D., OFCO, page 82

The analysis in Table 3-25 that shows that 60 percent of the watershed administrative units in the OESF have <1 percent of soils with a high likelihood of landsliding is either missing the point about the dominant controls on landsliding or is itself misleading. If the point is to show that particular soil types that are especially prone to landsliding are not common in the OESF, then the real question in regard to slope stability is the other controls (like slope steepness), as the small areas of "bad soils" are mostly irrelevant to assessing differences in landslide hazard within the OESF. If the point is to show that landslides are a high hazard on <1 percent of the terrain across most of the OESF, then truly this is an astounding "analysis," given the number of historical landslides from steep slopes on the western Olympic Peninsula.

Defining sites with a high likelihood of landslides as only those areas with soils developed on top of basalt or marine sediment on slopes greater than 70 percent is not a credible way to analyze the

potential for slope instability on the steep slopes of the western Olympic Peninsula, such as the Middle Hoh and Upper Clearwater River basins. The slopes in these areas are steep enough that even a rudimentary slope stability model can readily illustrate the potential for a change in root reinforcement to influence the stability of slopes underlain by the marine sedimentary rock that dominates these areas. The history of landsliding in the area also shows a clear potential for post-harvest slope failures from slopes that are not underlain by basalt or marine sediments. The application of a lithologic criterion that was derived from the post-mortem study of the slope failures in Southwest Washington does not translate directly to the OESF in the manner implied in this document. Indeed, the subsequent statement that "This relative scarcity of potentially unstable areas is reflected in the results for this indicator" is one of the most circular statements I have ever read in an EIS. Here DNR first defines an indicator for high hazard that is known to have little areal extent in the OESF (basalt and marine sediments, as opposed to sedimentary rock) and then trumpets that it finds little area at risk from landsliding by applying that metric—completely circular logic.

**Response:** For the No Action and Landscape Alternatives, DNR analyzed the number of forest stand entries the analysis model recommended in areas that have soils with a high likelihood of landslides, described as soils on top of marine sediment or basalt geologic units that are located in areas that are steeply sloped (over 70 percent). In the OESF, analysis has shown that landslides often are associated with certain geologic units, such as areas dominated by marine or basalt sediments (Sarikhani and others 2008, 2009). These geologic units have a much higher historic rate of landslides than other units. DNR selected these areas based on a study entitled "Landslide Emergency Response-Findings and Lessons Learned by the Washington Geological Survey's Response to the December 3, 2007 and January 7-9, 2009 Storms" (Sarikhani and others 2009). In this study, it was found that areas in southwest Washington with this combination of soil, underlying geology, and slope steepness were susceptible to landslides. DNR felt this approach was reasonable because the mapped geologic units in the 2009 study area are similar (but not identical) to those found in the OESF. DNR did not use any data from the 2009 study in its RDEIS analysis for the OESF.

The areas considered in this landslide potential analysis (described in the preceding paragraph) are separate from potentially unstable slopes or landforms, which were identified using a slope stability model and deferred from harvest in the analysis model. The analysis model did not recommend any forest stand entries in deferred areas under either the No Action or Landscape Alternative. DNR's slope stability model rated slope instability using criteria such as steepness and landform, specifically the presence of convergent slopes.

**No:** 220

**Topic:** Root Strength Following Harvest

**Source:** David Montgomery, Ph.D., OFCO, page 82

There is a very arbitrary assessment of what constitutes a high hazard from soil erosion or landslides buried in this statement: "DNR considers a potential high impact to be four or more

harvest entries (variable retention harvest or thinning) on soils with a high likelihood of compaction, erosion, displacement, or landslides, or that are the least productive, over 100 years."

As I read this, an area could be disturbed or harvested (partially) every 25 years and not be considered to have a high impact for soil erosion or landsliding. Yet as root re-growth following harvest takes approximately that long, the defined criteria would codify a perpetual state of reduced root strength as not being a "high impact." This does not sound reasonable to me.

**Response:** For this analysis, a high impact was defined as four or more harvest entries over 100 years on susceptible soils over more than 10 percent of state trust lands in a watershed administrative unit. Thus disturbance every 25 years would be considered a high impact.

**No.: 221**

**Topic: Identification of Potentially Unstable Slopes**

**Source: David Montgomery, Ph.D., OFCO, page 81**

The approach DNR presents explicitly relies on "field staff" (foresters and engineers) to "identify unstable slopes." The document notes that "If field staff are uncertain about indicators of instability they request that a geologist visit the site." This approach puts potentially untrained and unqualified personnel in the position of practicing geology by identifying areas of potentially unstable ground or by making a determination that no potentially unstable ground is present. This approach appears to violate state standards for the practice of geology by allowing unlicensed personnel to make geological assessments. In the RDEIS, DNR simply assumes that its standard practices defer areas of high risk from harvest. How well this assertion is met in practice is neither discussed nor evaluated in the RDEIS, despite the recent natural experiment in Southwest Washington that tested the efficacy of state forest practice rules and practices in regard to steep slopes. I may be mistaken, but I seem to recall that the "post-mortem" study of that event found a several-fold greater rate of sliding in recently harvested terrain than in mature timber.

**Response:** DNR does not have a separate potentially unstable slope process or procedure. DNR follows the forest practices rules (WAC 222) when identifying potentially unstable slopes or landforms, including all provisions regarding use of licensed geologists. WAC 222-16-050(1)(d) and WAC 222-10-030 require that any construction or harvest proposed on potentially unstable slopes or landforms be evaluated by a qualified expert. Qualified expert is defined in WAC 222-10-030 as "a person licensed under chapter 18.220 RCW as either an engineering geologist or as a hydrogeologist (if the site warrants hydrologist expertise), with at least three years of field experience in the evaluation of relevant problems in forested lands." The *Forest Practices Board Manual*, Section 16: Guidelines for Evaluating Potentially Unstable Slopes and Landforms (Nov. 2015) provides additional guidance on use of qualified experts for geotechnical issues. DNR monitors forest practice rule-making activity to ensure any rule changes are incorporated into its practices. DNR also follows the geologist licensing laws and rules in RCW 18.220 and WAC 308-15.

## ■ Subject 24: Wildlife

*No.:* 222

*Topic:* Habitat Configuration

*Source:* Gary Bell, WDFW, page 4

For interior older forest, our original scoping comments (2007) suggested some spatial analysis of older forest patches created. We are pleased to see that this issue was addressed, and the 100-acre assumption seems reasonable. However, we envisioned some additional spatial analysis of how related the modeled large patches would be (for example, nearest-neighbor analysis) to gauge potential functionality of the interior older forest patches as a measure of landscape continuity or patch connectivity.

**Response:** DNR appreciates this suggestion but did not conduct this analysis for the RDEIS or FEIS.

*No.:* 223

*Topic:* General Wildlife

*Source:* Donald Hansen, page 1

How is the wildlife doing? Can the results be quantified?

**Response:** For its RDEIS, DNR analyzed the potential environmental impacts of the proposed management alternatives on wildlife habitat. Refer to “Wildlife” beginning on page 3-181 of the RDEIS for the analysis results.

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# Comments Received

Beginning on the follow page, DNR provides the comments received on the RDEIS in their original format.

# American Forest Resources Council (AFRC)

Comments Received



December 16, 2013

Via email to [sepacenter@dnr.wa.gov](mailto:sepacenter@dnr.wa.gov)

SEPA Center  
P.O. Box 47015  
Olympia, WA 98504-7015

RE: Comments on the Revised Draft Environmental Impact Statement on the Olympic Experimental State Forest (OESF) Forest Land Plan

Dear Responsible Official:

Thank you for the opportunity to comment on the revised draft environmental impact statement (RDEIS) on the Olympic Experimental State Forest Land Plan (“the Land Plan”). We also want to thank the DNR staff members who took time to meet with us on December 3 to help us understand the Land Plan. In spite of their efforts, we continue to have questions about the Land Plan itself, and how the functioning of the forest estate model resulted in the outputs that are displayed in the Land Plan.<sup>1</sup> AFRC looks forward to working with DNR staff going forward to further understand the Land Plan, to help staff craft a reasonable additional alternative to be considered in the final EIS, and to refine the Land Plan so that it fully achieves the objective of integrating conservation with commercial production in a manner that is consistent with DNR’s obligations to manage the 257,000 acres of trust land in the OESF, as all trust lands, with undivided loyalty to the trust beneficiaries.

### **The Foundation of the OESF and the HCP**

The OESF is unique among the trust lands that DNR manages because of the relatively high percentage of old forest that remains in the OESF, particularly in the Clearwater (30%), Reade Hill (27%), Queets (23%), Willy Huel (22%), Goodman (21%), and Kalaloch (18%) landscapes. That makes it ideally suited as a place to learn how to integrate conservation with production across the landscape (HCP IV.81), because it has an existing component of the forest that may be important to conservation functions.

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<sup>1</sup> We are attaching a summary of the questions we had for staff December 3, 2013. Although we received valuable information verbally, we ask that these questions now be treated as formal comments on the RDEIS, because of their importance to the integrity of the Final Environmental Impact Statement.

The fact that this is trust land, however, is an overarching consideration in developing a land plan for the OESF. As the 1997 State Trust Lands Habitat Conservation Plan (HCP) states because this is trust land,

The Board of Natural Resources is required, by statute, to establish “policies to insure that the acquisition, management and disposition of lands and resources within the Department’s jurisdiction are based on sound principles designed to achieve the maximum effective development thereto.”

HCP II.1, quoting RCW 43.30.150, now recodified as RCW 43.30.215.

DNR must manage the land in the OESF with undivided loyalty to the trust beneficiaries, to the exclusion of all other interests, and manage trust assets prudently. HCP II.2. The HCP further recognizes that DNR’s objective for all trust lands is “to produce the most substantial support possible over the long term consistent with all trust duties conveyed on DNR by the state of Washington.” *Id.* The fact that the OESF has been designated to have an additional objective of learning how to integrate conservation with commercial production does not change the application of any of those trust principles. The management of the OESF must accomplish the objective of learning to integrate conservation with commodity production, consistent with its being managed for the benefit of the trust beneficiaries.

The HCP establishes additional general principles upon which the Land Plan must be based. First, the OESF is to be managed as an unzoned forest. The HCP provides that “[t]he riparian areas, which provide the foundation for the conservation strategies, will be treated almost like ‘zones’, because they are linked to relatively fixed physical features on the landscape.” HCP IV.81. Beyond the riparian areas, however, there were to be no “zones” in the OESF.

According to the HCP, the conservation strategies that the Land Plan is to be based on are:

1. To protect, maintain and aid natural restoration of riparian systems on DNR managed land in the OESF, while promoting a long-term integration of resource use and conservation.
2. To rely on the riparian strategy to provide the physical and biological foundation around which management activities and upland conservation strategies are constructed, recognizing the vital role of watersheds in supporting the web of life.
3. To look to natural disturbance regimes for the keys to understanding how to achieve restoration and maintenance of natural systems.
4. To learn to integrate older forest ecosystem values and their functions with commercial forest activities assuming, as a working hypothesis, that landscapes managed for a fairly even apportionment of forest cover among stands in all stages of development, from stand initiation to old growth [citation omitted] will support desirable level of both commodities and ecosystem functions.

5. To consider the spatial arrangement of habitat and other conservation values being provided on federal lands when developing habitat within the Experimental Forest.
6. To fill critical information gaps related to aquatic, riparian, and upland ecosystems and the links between these and forest management activities in order to enhance DNR's decisions and check assumptions behind strategies and techniques.

HCP IV.81-.82.

The HCP imposed one other working hypothesis on the OESF Land Plan, and that was that DNR can meet its objectives for both commodity production and spotted owl conservation in the OESF “by managing each landscape planning unit to maintain or restore . . . 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 at least 40 percent of DNR-managed lands in the landscape planning unit in the stem-exclusion to old-growth stages that are potential old-forest, sub-mature, or young-forest marginal spotted owl habitat types. . .” HCP IV.88 [citations omitted].

The Landscape Plan is to be the basis for integrating production and conservation. HCP IV.83. Thus it is the critical missing element to describe how DNR will achieve the multiple objectives of the OESF, consistent with the overarching responsibility to the trust beneficiaries.

### **Concerns with the Land Plan**

With that foundation for the Land Plan, AFRC is concerned by the fact that the Land Plan starts by taking 110,832 acres of the 257,566 acres (43%) off base for the next 100 years. RDEIS 3-6. We do not understand how that is different from creating a “zoned forest,” and thus violating the first principle of the OESF – that it be managed as an unzoned forest.

We understand that some 48,911 acres (19%) of the OESF is considered old forest, much of which would be deferred from harvest under the Policy on Old-Growth Stands in Western Washington.<sup>2</sup> *Policy for Sustainable Forests*, p. 34. That leaves 61,921 acres that are taken off base for the next 100 years in the Land Plan that is not old-forest. From our discussions with staff, we also understand that most of that additional 62,000 acres that are taken off base are not riparian areas, are not now habitat of any form, and will not contribute to meeting the 20-40 goal for conservation objectives over the foreseeable future.

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<sup>2</sup> The Policy on Old-Growth Stands in Western Washington only applies to stands that originated naturally before the year 1850. The HCP, by contrast, treated as “old forest” either “a) untreated stands 101 year old or older, or b) stands that were 71 years old or older when they were partially-harvested over 51 years ago,” [and thus in 1997 were at least 122 years old]. HCP IV.98, note 5. Some of those stands would not be “old-growth” under the Policy on Old-Growth. The Policy on Old-Growth also provides that “inside the [OESF] the department may conduct operations in old-growth stands consistent with the requirements of DNR’s [HCP] to meet the research objectives of the [OESF].” So the Policy on Old-Growth explicitly does not place all old-forest stands in the OESF off base.

Although staff was not able to give us a detailed breakdown of the reasons for the deferral of those 62,000 acres, we gathered that most of it was taken off base because of concerns about unstable slopes. Their impression was that much of the area was in overstocked plantations, some 30-50 years old, that because they are in the stem exclusion stage on the Olympic Peninsula, without management may not actually develop significant habitat value for 150 years or more. Two things are important about that.

First, we can find no policy that precludes all management of stands on unstable slopes in the OESF. The HCP does preclude or severely limit management on unstable slopes in the five west-side planning units. However that policy does not apply to the OESF. The very “experimental” nature of the OESF and its mission to learn how to better integrate conservation with commercial forestry implied that DNR would be able to manipulate areas of the land base that are not suitable for intensive forestry, in order to enhance the contribution of those areas to wildlife conservation. While AFRC does not disagree that any manipulation of stands on potentially unstable slopes should be done with care, and likely requires a “light touch,” we do not believe either the HCP, or any other adopted policy, forecloses actions such as variable density thinning, after expert review, which may take stands that currently offer little habitat value to a condition where they help meet the 20-40 goal for habitat. Indeed, if DNR does have a policy that requires taking nearly 62,000 acres of the 257,000 acres off base while it contributes little or nothing to conservation values, the Land Plan should call for the Board of Natural Resources to reconsider that policy.

Second, taking 62,000 acres of what is not now, and will not become, habitat off base for 100 years, places an unfair and inappropriate burden on the remainder of the OESF trust lands to meet the 20-40 goal of providing 40% of the land in habitat conditions. The Land Plan is intended to integrate conservation objectives with commercial production. The working hypothesis stated in the HCP was that the riparian areas would form the backbone of the conservation strategy. Riparian areas must be managed on a basis that does not generate significant revenue for the trust beneficiaries – or much volume for purchasers – but the riparian areas were also assumed to provide a significant portion of the lands required to meet the 20-40 goal. The assumption of the HCP was that roughly 60 percent of the OESF could be devoted to commercial production using something approaching normal commercial practices under the forest practices rules.

Our understanding is that commercial forest managers on the Olympic Peninsula consider 50-60 years to be the rotation age which typically results in maximum net present value for a forest stand. According to the Land Plan, by the time the Land Plan takes 43% of the land off base, then complies with the HCP riparian area requirements, and meets the 20-40 goal, only 73,269 acres (28%) of the OESF is available under the Land Plan for what a private land manager would consider commercial management.

The Land Plan also shows that under the forest estate model, some 26,230 operable acres are not scheduled for any harvest of any kind over the 100-year horizon of the plan, and another 23,365 operable acres are scheduled for only thinning. Thus under the forest estate model, another 19% of the land base is not to be managed on any commercial basis. In our meeting with staff, they had no explanation for why 26,000 operable acres would not be scheduled for any

harvest activity. We assume – but staff could not confirm – that the “thinning only” stands may be heavily in the riparian areas. But it appears that as a consequence of the Land Plan taking 62,000 acres off base which are neither old-forest nor likely to become habitat without management, a significant additional amount of the operable uplands have been left without management or with management that is not likely to generate significant commercial production. We do not believe that this outcome would be consistent with DNR’s trust responsibilities. We believe that if the use of the forest estate model to manage only 57% of the land in the OESF, it is incumbent on DNR to understand and explain what causes the forest estate model to leave so much operable land underutilized.

The RDEIS appear to project that on average, over 100 years of management, the OESF will produce roughly 85 million board feet per year of harvestable volume.<sup>3</sup> That comes to about 330 board feet per acre per year, which we understand is substantially below the expected production from commercial forest lands on the western Olympic Peninsula. Although the goal of integrating conservation with commercial forest production can be expected to involve some tradeoffs, we have concerns that by starting with taking 43% of the land in the OESF off base, without managing much of it for either conservation or commodity production, the Land Plan has violated the trust principles that are foundational for all DNR’s management of trust land.

### **Concerns with the RDEIS**

We want to start by complimenting staff on many improvements in the RDEIS as compared to the original draft EIS for the OESF Land Plan which was issued in 2010. Its format is much easier to follow; its graphics much more clearly convey the expected impact of the proposed alternative, and how, if at all, those impacts differ from the no-action alternative. Although there are undoubtedly points where reasonable minds might differ about the clarity or completeness of the analysis, if the only function of the EIS were to report on the projected environmental impacts of the proposed action, we believe the RDEIS would pass the “rule of reason” test by which environmental impact statements are reviewed by the courts.

### **The Final Environmental Impact Statement Must Examine Additional Alternative Actions.**

We are concerned, however, that the RDEIS does not meet another key function of the SEPA process, which is to compare the proposed alternatives to other reasonable alternatives that might achieve the proposal’s objectives at lower cost. There appears to be essentially no difference between the no-action alternative and the proposed action, except for the use of the forest estate model to select stands for harvest, under the same standards as would be used in the absence of the forest estate model. We applaud DNR’s use of computer technology in the management of its trust lands. But the outcome, in terms of environmental impacts, should be essentially the same whether DNR managers start with a list of stands to consider that was generated by a computer or use more traditional means to select stands for harvest consideration. Indeed, the comparison of impacts between the no-action alternative and the proposed alternatives confirms that the two alternatives are effectively identical. At least as important,

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<sup>3</sup> That is estimated from the chart on p. 3-19 of the DSEIS. If the actual numbers are stated, we have not found them.

SEPA requires that public bodies consider a reasonable range of alternatives prior to making such long-term decisions as the adoption of a land plan for 257,000 acres of public land.

SEPA requires that every EIS include both a description of the proposed action and alternatives to the proposed action. RCW 43.21C.030(c)(iii), WAC 197-11-440(5). Washington courts have said:

The required discussion of alternatives is of major importance, because it provides a basis for a reasoned decision among alternatives having differing environmental impacts.

*Brinnon Group v. Jefferson County*, 159 Wn.App. 446, 481, 245 P.3d 789 (2011).

The SEPA rules provide that when a proposal is for a private project on a specific site, the lead agency is only required to evaluate the proposed action and the no-action alternative. WAC 197-11-440(5)(d). But for a proposal to manage 257,000 acres of public land, WAC 197-11-440(5)(d) has no application. See also, *Northwest Ecosystem v. Rey*, 380 F.Supp.2d 1175, 1186 (W.D. Wash. 2005) (“an agency may not define the purpose [of its proposal] in unreasonably narrow terms. An agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency’s power would accomplish the goals of the agency’s action and the EIS would become a foreordained formality.”)

We believe that the Final EIS for the OESF Plan can and should cure the deficiency in the RDEIS by considering an alternative which seeks to manage the non-old-forest stands that the proposed alternative takes off base to create the required habitat as quickly as possible, by the use of variable density thinning or other light-touch methods. The alternative should, as a result, free up any operable uplands that are not required in order to meet conservation objectives to instead be used for commercial forestry. The alternative must also either explain why the forest estate model calls for 26,000 operable acres to receive no harvest of any kind during the next 100 years, or make adjustments to the forest estate model to insure that all operable acres not required to meet the riparian strategy, or whatever portion of the 20-40 goal that cannot be met by the riparian strategy, are managed for commercial production with the maximum sustained yield.

An option similar to that used in the South Puget Planning Unit Forest Land Plan would be to create an exploratory Alternative which looked at potentially increasing the opportunities for experimentation and increasing harvest levels on the OESF. We understand this may require changes to DNR policy and procedures. This alternative could serve to contrast a less stringent regulatory operating environment with the current proposal. This contrast would also serve to frame the opportunities given up by the beneficiaries in the HCP for expected long term guarantees of returns.

## Comments specific to the REDEIS

We understand the need to show outputs for modeled volumes, acres by treatment, etc. but we feel greater effort needs to be put forth in explaining the fact many of these numbers are dynamic and will change over time and with update runs of the model. This is particularly the case with the “operable but unscheduled acres” description. It is too easy for these numbers to become expectations rather than just the model result at this particular point in time. DNR should provide a much more explicit and concise explanation in the FEIS about how these values are dynamic and will change over time and successive model runs.

While we commend DNR on producing a more readable EIS and Forest Land Plan when compared to the document produced in 2010, we note that the heavy reliance on Appendices coupled with poorly designed and/or explained graphs and charts, makes portions of the document difficult to follow or understand. We urge streamlining and simplification in the FEIS.

An example can be found on pg 3-24 in reference to the impact based on the number of stand entries. There is no substantive discussion on how DNR determined the combinations of stand entries and their impact, beyond DNR considering 4 or more entries in the planning period of 100 years (pg 3-92) to have a high impact. The tables shown in Appendix E (Tables E-13 to E-23) all seem to include entries of 3 or more as having high impact. Yet there is no explanation for this variance from the discussion of 4 or more on pg. 3-92. Additionally, these tables do not explain how DNR determined the acres with no entry. It seems logical to assume these acres would be made up from the deferred acres. However, a comparison of these acres with Table A-18 in Appendix A, we could not find a correlation between “No Entry Acres” and “Deferred Acres.” It is possible these “no entry” acres also include the “operable but unscheduled acres” but we have found nothing in the document to explain this discrepancy.

Another example of the challenges with the tables and charts can be found in Tables E-11 and E-12. There is no explanation given as to why the No Action and Landscape Alternatives number of acres were summed for each number of entries. While it is understandable why DNR would like to compare the two Alternatives in these tables, it does not make sense to sum the values for each watershed.

### Discussion on Impacts to Soils pp. 3-104 to 3-111:

The Impact Ratings on soil compaction appear to be based solely on number of harvest entries, but does not seem to take into account harvest systems type. No mention of the spatial location of these soils is made (ex. Low gradient slopes vs. higher gradient slopes) and the impacts on harvest system choice this may make. The document states the use of cable systems may be a means mitigating these impacts. The question should then be asked, what level of compaction impact is there if the portions of the analysis area are not suitable for use of ground based harvest systems due to slope to begin with?

Is there any research evaluating the soil compaction differences between ground based thinning and ground based regeneration harvesting?

In Appendix C on page C-21, as part of the Traffic Impact Score rating it is unclear why the various types of unpaved road surfaces were broken out. The formula used for computing the scores appears to only differentiate between paved and unpaved. Does DNR expect there would be variations in sediment production and/or delivery based on differences in unpaved road surfacing type? If there are expected variations should these be taken into account when modeling sediment delivery? It would make sense that the presence, quality of rock, size of rock, and wear ability of road surfacing would impact sediment production.

It is also troubling that much like the 26,000+ acres of operable but unscheduled acres, there is no further investigation of the “other” road surface type and what its attributes are. Since this is the second largest group of roads, it would seem important to understand what these attributes are. This would be especially important if variations in sediment production are anticipated based on difference in unpaved road surfacing.

The preceding comments on pages 7 and 8 are provided in an attempt to constructively show the need in portions of the document for in depth explanations of decisions and outputs.

AFRC appreciates the opportunity to provide comment on the RDEIS. We stand ready to assist DNR staff as it moves forward to produce a Final Environmental Impact Statement that corrects the deficiencies we have identified and clarifies the environmental impacts of the action ultimately chosen by the Department.

Very truly yours,

Tom Partin, President

Encl: AFRC Questions for the OESF DEIS, December 3, 2013

cc: Kyle Blum, Deputy Supervisor Uplands

## Questions for the OESF DEIS

- On page 71 of the Draft OESF Plan, it states that 26,289 acres (18%) of the operable area has no harvest activities scheduled. Can you provide a breakdown of the acres within this category by the various reasons described in the paragraph on page 71?
  - As a follow up can you please explain how: “..an expectation that the best pathway to meet conservation objectives is “no management.” is different from a long term deferral?
  - How are “long term deferrals” different from not assigning harvest activities to these acres?
  - Did you do a sensitivity analysis to determine any cause for the unscheduled acres?
  
- It appears in the documentation that only existing roads were used in this calculation. If only existing roads were used, then is the “prohibitive road costs” limit due to long haul distances over road segments with extremely high replacement cost values?
  - Can you explain how new road construction costs were accounted for in the modeling effort?
  - Could you provide a breakdown of the figures that went into calculating the road costs? The cost per mile works out to around \$132,000 to \$237,000
  - ARRF rates were considered a “cost” when evaluating harvesting costs. If ARRF is used for maintenance of roads should it also be considered in the replacement cost of the roads? It would seem that ARRF should help to offset the replacement cost of the road system, assuming some maintenance costs are factored into the 30 year life span of the road.
  
- Can you explain how stands are assigned to the various rotation ages (40, 50, 60, 70, and 80+) and describe or show where they are spatially located on the landscape?
  
- Can you explain how stands were assigned to the Thinning Only regime and describe or show where they are spatially located on the landscape?
  - Are these stands only associated with Riparian Areas or are they also associated with Upland Areas?
  - If associated with Uplands what is the reasoning behind assigning them to a Thinning Only Regime?
  
- Do the “Operable” acres include acreage within Riparian Areas that can be managed according to various DNR policies and procedures?
  
- Was there any modeling conducted to evaluate the potential to accelerate the 20/40 goal through management of stands? The documentation states that the 20/40 goal was modeled using no management activities.
  
- With 43% of the land base in Long Term Deferral, why does it take so long to reach the 20/40 goal in many of most of the Landscapes? Our assumption is that most of the Long Term Deferrals are due to other issues than habitat and therefore may be located in younger age classes.

- Can you breakdown by acres or percentage the various types of Long Term Deferrals?
- How much is related to or located in Riparian Areas?
- In reviewing the 20/40 graphs in Appendix A which show the thresholds, why in some landscapes which reach the 20% threshold does the percentage of old forest continue to climb? Would it be incorrect to assume that as the Riparian Area Contribution to the 20% increases the upland contribution would be able to be reduced?
- The graph showing the impacts of budget on volume shows \$2.6M/yr, \$1.75M/yr, and the \$1.35M/yr lines trending downward at nearly the same rate (\$2.6 a bit steeper) for the first decade. Yet the \$3.5M/yr line is relatively flat in comparison. What is the reasoning for this? The other three trend along a similar line, yet the 3.5 varies over the 100 year planning window.
- As part of the Adaptive Management and Monitoring process, where does the harvesting component factor into the process? It seems that most all of the concepts around research are looking at habitat and ecologic outcomes and not the economic results. Are there any thoughts on looking into the commercial goals of the OESF beyond the traditional VRH/VDT harvests and avoiding expensive road locations?
- Can you explain and show any changes to harvest volumes by trust between the two alternatives?

December 3, 2013

# Conservation Northwest

**Comments Received**

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SEPA File No. 10-060101

December 16, 2013

RE: Revised draft Environmental Impact Statement on the Olympic Experimental State Forest (OESF) HCP Planning Unit Forest Land Plan

To the Department of Natural Resources:

I write on behalf of Conservation Northwest and its members and supporters to provide comment on revised draft Environmental Impact Statement (EIS) on the Olympic Experimental State Forest HCP Planning Unit Forest Land Plan.

DNR's Revised Draft Forest Plan for the Olympic Experimental State Forest (OESF Plan) fails to meet conservation objectives for the northern spotted owl. DNR's HCP requires the OESF Plan to provide the necessary quality, quantity and distribution of owl habitat in each landscape unit for demographic support towards the long-term conservation of the Olympic owl population. The OESF Plan's reliance on faulty assumptions that conflict with basic and well-documented spotted owl biology and its failure to consider substantial owl threats would create conditions that appreciably reduce chances of owl survival and recovery. Its landscape-level planning and EIS do not ensure that the OESF will be occupied by successfully reproducing spotted owls that function as a segment of the Olympic owl population. The OESF Plan will likely have a significant adverse environmental impact that was not disclosed or considered in the EIS, and should be withdrawn until its deficiencies can be resolved.

#### Background

DNR's objective for spotted owl conservation on Washington State's public forests is to provide habitat that makes a "significant contribution to demographic support, maintenance of species distribution, and facilitation of dispersal." (WDNR 1997, p. IV.1) Demographic support is the contribution of individual territorial spotted owls or clusters of spotted owl sites to the stability and viability of the population (Hanson et al. 1993).

The HCP's spotted owl conservation strategy for the OESF has three objectives:

1. 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."
2. to develop, test, and refine management practices for stands "functioning as dispersal, foraging, roosting, and nesting habitat for spotted owls."

3. to develop, implement, test and refine landscape-level forest management techniques that support “occupancy by successfully reproducing spotted owls that are functional segments of the Olympic Peninsula subpopulation.” (WDNR 1997, p. IV.86)

One landscape management technique presented in the HCP is the working hypothesis that “landscape managed for a fairly even apportionment of forest cover among stands in all stages of development, from stand initiation to old growth (Oliver and Larson 1990) will support desired outputs of commodities and ecosystem functions.” (WDNR 1997, p. IV.87) The HCP also posits another working hypothesis that “DNR can meet its objectives for commodity production and spotted owl conservation on the OESF by managing each landscape planning unit to maintain or restore threshold proportions of potential habitat.” (WDNR 1997, p. IV.88).

The 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 of DNR-managed lands in the landscape planning unit in the stem-exclusion to old-growth stages that are potential old-forest, sub-mature, or young-forest marginal spotted owl habitat types, including and old-forest habitat described in (1) above.

In keeping with its adaptive management principles, DNR’s 1997 HCP recognized that the knowledge at the time was insufficient to answer questions about integrating conservation and production. The HCP’s working hypotheses were intended to be evaluated, applied systematically and refined (WDNR 1997, p. IV.88). As new information and understanding developed over time, it would be incorporated into plans and activities, allowing DNR to “apply this knowledge, adjusting management activities and techniques and revise assumptions and hypotheses.” (WDNR 1997, p. IV.86).

#### The OESF Revised Draft Forest Plan

The Revised Draft Forest Plan for the Olympic Experimental State Forest presents its own spotted owl conservation objectives:

- To restore and maintain northern spotted owl habitat capable of supporting owls in each of the 11 landscapes in the OESF; and
- To develop and implement a forest plan that does not appreciably reduce the chances for owl survival and recovery.

To assess progress towards objectives and consider whether the OESF Plan has probable significant effects on the environment, DNR crafted three indicators:

1. Number of acres of modeled owl habitat (Old Forest and Young Forest)
2. Numbers of acres of modeled owl habitat types
3. Number of modeled potential owl “territories”

For modeled owl habitat, DNR assigned each landscape an “impact rating” based on whether modeled habitat amount is projected to increase, remain even, or decrease.

For modeled owl habitat types (Movement, Roosting, Foraging, Nesting), DNR used stand-level models to generate a score (0-100) for each habitat type in each forest stand. It then assigned an impact rating based on the number of stands with a score 50 and above.

For modeling potential owl territories, DNR used habitat scores from 500 model runs to identify the number of potential owl “territories” the OESF could support over time. DNR then assigned an impact rating based on whether the number of potential owl “territories” was projected to increase, remain even, or decrease.

The impact ratings were used to determine that there is no probable significant adverse environmental impact from either alternative on the indicators.

### Analysis

1. DNR must update its working hypotheses and underlying assumptions to align with modern science.

The notion that “even apportionment of forest cover among stands in all stages of development” over time can provide demographic support for owl conservation is antiquated. The hypothesis has been nullified. Spotted owl survival, fecundity, and abundance are higher in areas with greater amounts of old forest habitat (Bart and Forsman 1992, Bart 1995). Large blocks of habitat supporting multiple pairs of owls are more likely to contribute to long term owl 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). Fragmentation of large blocks of habitat is associated with reduced demographic performance (Courtney et al. 2004), particularly on the Olympic peninsula where spotted owls have larger home ranges due to reliance on northern flying squirrels which have low population densities.

Similarly without merit is the notion that an “unzoned forest” can provide functional nesting habitat (supporting individual territorial spotted owls or clusters of spotted owl sites for stability and viability) for spotted owls. Spotted owls exhibit high nest site fidelity. Spotted owls with established territories are likely to be more successful if they remain in those territories (Franklin et al. 2000). Circles matter more than ever.

Furthermore, few of the assumptions underlying DNR’s conservation strategy for the OESF can withstand scrutiny today. Most of the factors related to owl population stability in the Olympics, such as 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, have changed substantially since 1997.

It was believed at the time, for instance, that the Olympic subpopulation was substantially larger, interconnected, and either stable or declining slowly (Holthausen et al. 1995, Burnham et al. 1994). It also was believed that the overall status of the Olympic Peninsula population was secure (WDNR 1997, p. IV.102). The HCP’s heightened expectations of a stable owl population prompted “considerable flexibility in developing a conservation strategy for DNR-managed lands.” (WDNR 1997, p. IV.101).

None of these primary assumptions remain valid. Recent analysis on spotted owl demography performance in the Olympics indicate that spotted owls are not stable, and have declined at a rate of 4.3% a year between 1992-2008 (Forsman et al. 2011). Owl populations in the more rapidly declining populations, including the Olympics, dropped by 40-60% over a 10 year period (Forsman et al. 2011). Data hasn't been collected on DNR lands since 2001, but occupancy rates of spotted owl territories in adjacent federal lands have declined by 60% between the early 1990s and 2008 (Gremel 2008).

Despite an abundance of new information and understanding about spotted owl biology and conservation, DNR has made no adjustments or revisions to its assumptions or working hypotheses, and it continues to rely on a scientifically-unsupportable management strategy. DNR's outdated approach is likely to have significant adverse environmental impacts that are not disclosed or considered in the EIS.

With new knowledge and information related to spotted owl conservation science, DNR must consider adjustments or revisions to its assumptions, working hypotheses, and landscape management techniques intended to provide demographic support to the Olympic owl population.

2. DNR must update its working hypotheses and underlying assumptions to align with modern policy.

The OESF Plan must incorporate and apply current owl conservation policy. Although lands covered by HCPs are typically considered compliant the Endangered Species Act when they provide for the conservation of key habitat areas and occupied sites (USFWS 2011, p. III-52), the OESF Plan area is a distinct anomaly. It is unique not just to the DNR HCP, but all HCPs. Through a subsequent planning process, just now being seriously initiated, OESF Plan actively adjusts plans and activities to incorporate and apply new social and ecological knowledge to meet its objectives. It's designed to be dynamic, current, and evolving.

In 2011, the US Fish and Wildlife Service (Service) issued its Revised Spotted Owl Recovery Plan, finding that past habitat loss, current habitat loss, and competition from barred owls represented the most pressing threats to the spotted owl (USFWS 2011, emphasis added). The Service reports that west-side provinces, including the Olympic Peninsula, scored high on threats from "the negative effects of habitat fragmentation and ongoing habitat loss as a result of timber harvest." (USFWS 2011, p. 1-8).

The Service also determined the barred owl threat was "extremely pressing and complex, requiring immediate consideration." (USFWS 2011, p. 1-8, emphasis added). Barred owls compete directly with spotted owls for habitat and resources for breeding, feeding, and sheltering. Research has shown that spotted owl occupancy and colonization rates decreased as barred owl presence increased and available habitat decreased (Dugger et al. 2011). The Service determined that the need to conserve and restore large areas of contiguous, high quality habitat across the range of the owl has intensified as a result of competitive pressure from barred owls (USFWS 2012). Therefore, the Service recommends "conserving and restoring older, multi-layered forests across the range of the spotted owl." (USFWS 2011, p. 1-9).

Since owls continue to decline, face a severe threat from barred owls, and are experiencing loss in genetic diversity, the Service also recommends “conserving occupied sites and unoccupied, high-value spotted owl habitat on State and private lands wherever possible.” (USFWS 2011, p. III-51). Retaining spotted owls at existing sites is an effective approach to conserving spotted owls because owls in established territories are likely to be more successful if they remain in those locations (Franklin et al. 2000).

With new knowledge and information related to spotted owl conservation policy, DNR must consider adjustments or revisions to its assumptions, working hypotheses, and landscape management techniques intended to provide demographic support to the Olympic owl population. DNR’s failure to incorporate new information is likely to have significant adverse environmental impacts that are not disclosed or considered in the EIS.

### 3. The OESF Plan does not minimize or mitigate take

Conservation Objectives: The OESF Plan fails to demonstrate how HCP objectives are attained. For instance, the HCP sets an objective of a landscape management that supports “occupancy by successfully reproducing spotted owls that are functional segments of the Olympic Peninsula subpopulation.” But the OESF Plan’s owl section contains no information or analysis on whether or not this objective is being pursued or could be achieved.

Whereas the HCP sets an objective for stands ecologically functioning as “dispersal, foraging, roosting, and nesting habitat for spotted owls,” the OESF Plan’s contains no assessment of the composite of ecological functions in stands modeled as Movement, Roosting, Foraging, Nesting habitat, or any scientific basis for habitat scores used in its analysis. DNR has conducted no field reviews or field verification, so there is no way to know if and how model results correspond to physical conditions on the ground (e.g. owl nesting, owl foraging, etc.) or spotted owl survival and recovery.

The OESF Plan and HCP share an objective of a landscape plan that does not appreciably reduce the chances for owl survival and recovery, but the OESF Plan’s owl section presents no quantitative analysis or scientific evidence that the OESF Plan might meet this objective. What are the owl’s chances for survival and recovery in the OESF? Is it reduced? Is it appreciably reduced?

Modeled vs. Actual: In modeling acres of spotted owl habitat, the DNR assigned each landscape an impact rating based on the projected change in habitat amount. However, the rating system is inadequate for evaluating habitat occupancy by successfully reproducing owls, or owl chances of survival and reproduction.

In modeling acres for spotted owl movement, roosting, foraging, and nesting, DNR provided no information or analysis how a minimum score of 50 specifically relates to owl habitat function as roosting, nesting, foraging or dispersal habitat.

In modeling spotted owl territories or home ranges, the OESF Plan allocated 7,400 acres for a spotted owl home range and allows 25% overlap among home ranges – as a result, modeled owl

home ranges were 5,550 acres. The median size of annual home range for a real spotted owl on the Olympic peninsula is 12,424 acres (Forsman et al. 2007), two and a quarter times larger than DNR's modeled owl home range. While there is evidence of owl home ranges overlap in the Olympics, researchers emphasized it should not be misconstrued as a recommendation to manage owls based only on "core" areas. In particular, lands managed for owl survival and reproduction, such as the OESF, management "should be based on amounts of habitat within the entire home-range areas... not just core areas." (Forsman et al. 2007, p. 375).

The OESF Plan and EIS must use best available scientific information in evaluating and disclosing impacts to spotted owls and its habitat. Modeling inputs for owl home range size vastly overestimate the OESF's potential owl contribution to the Olympic population and vastly underestimate the probability of significant adverse environmental impacts, introducing uncertainty about the scientific rigor of data and assumptions in other models used in the OESF analysis. While the DNR has compiled a bit of information on stands which may serve as different types of owl habitat, it provides no analysis on how these stands function in concert as a whole on the landscape to shape owl survival and recovery. As a result, impacts to spotted owls are not disclosed by the OESF Plan and EIS but are likely to be significant and adverse.

#### Owl Nest Sites:

The Service recommends conserving occupied sites and unoccupied high-value spotted owl habitat on State and private land wherever possible because of persistent owl declines, severe threats from barred owls and loss of genetic diversity. (USFWS 2011, p. III-51). The OESF Plan must incorporate new scientific and policy information and conserve occupied owl sites and unoccupied high-value spotted owl habitat on the OESF. Retaining spotted owls at existing sites is an effective approach to conserving spotted owls because owls in established territories are likely to be more successful if they remain in those locations (Franklin et al. 2000).

Protecting owl sites and high-value (structurally complex, nesting/roosting/foraging) habitat is entirely compatible with the OESF. Although the OESF has a goal of unzoned forest, it emphasizes that the distinction between zoned and unzoned is not absolute "because there is a physical and biological zonation in forest landscapes that must be respected and that links directly to the processes and functions that the OESF seeks to understand." (WDNR 1997, p. IV-81). Based on new information regarding the importance of existing owl sites and high-value owl habitat to owl survival and recovery, the OESF Plan must consider protecting this habitat. If these areas are not protected, the EIS must evaluate impacts to owl survival and recovery, which are likely to be significant and adverse.

The OESF Plan aims to log between 3,300 and 16,000 acres of owl nest sites each decade on the OESF, but makes no effort to evaluate impacts of logging nest sites on meeting HCP and OESF conservation objectives, including demographic support to the Olympic owl population. Since DNR lacks surveys, impacts to occupied owl sites and unoccupied high-value habitat are unknown and not disclosed in the EIS.

#### Spatial Distribution of Habitat

While the EIS does provide some information on the quantity of forest types that are predicted by various DNR models, it does not indicate how the shift of habitat patterns in the landscape

units over time affects HCP objectives for spotted owl survival and recovery.

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.” WDNR (1997), 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.*” WDNR (1997), p. IV.91; “Plans for harvest of young- or old-forest habitat will recognize *the importance of interior old-forest conditions* to overall ecosystem function and will maintain or develop these conditions in accordance with landscape plans” WDNR (1997), p. IV.99; “...the composition and pattern of forested landscapes determine their capacity as spotted owl habitat.” WDNR (1997), p. IV.102).

The distribution of habitat, including patch size, patch isolation or connectivity, and edge contrast, have profound effects on wildlife (Diaz and Apostol 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.

The OESF Plan anticipates increased edge effects (p. 3-195) and increased habitat fragmentation (e.g. decreased patch size of interior forest conditions (p. 3-196); increased abundance of small 100 to 250 acre patches (p. 3-197)), but makes no effort to evaluate impacts to spotted owl from these well-recognized threats.

Failure to provide information on the distribution of owl habitat over time, to ensure sufficient interior forest conditions for spotted owl demographic support 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 OESF 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.

DNR treats threshold proportions (20/40) as targets, despite HCP direction that thresholds are not intended to be targets but minimum standards (WDNR 1997, p. IV.88). The HCP anticipated that DNR management would result in sufficient 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 (WDNR 1997, p. IV.180).

In contrast, the OESF Plan predicts that the OESF landscape will have only 26% of structurally complex forest by 2100 (Chart 3-11, p. 3-41). Furthermore, the OESF Plan proposes logging between 3,300 and 16,300 acres of quality owl habitat from owl nest sites each decade on the OESF, despite the fact that owl nest sites are most likely to be re-occupied by recovering spotted owl populations. Managing to threshold targets is likely to further imperil northern spotted owls.

Under either Alternative in the OESF 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, including nest sites, in the OESF landscape will contribute to spotted owl conservation. Given the habitat loss is a major threat to spotted owl conservation, the OESF Plan will probably appreciably reduce chances of survival and recovery of the northern spotted owl population on the Olympic peninsula and foreclose options for ecosystem support provided by older forests.

As a result, the OESF Plan is incompatible with the HCP. 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.

#### Barred owls:

Barred owls pose an immediate threat to spotted owl conservation. Barred owls compete directly with spotted owls for habitat and resources for breeding, feeding, and sheltering. Research has shown that spotted owl occupancy and colonization rates decreased as barred owl presence increased and available habitat decreased (Dugger et al. 2011). Prediction of stable owl populations in the Olympics by Holthausen and others (1995) is undermined by barred owl competition.

The OESF Plan acknowledges increasing population size and threats from barred owl including exclusion and displacement of spotted owls by barred owls (Gremel 2008) and negative effects on northern owl survival on the Olympic peninsula (Anthony et al. 2006), but makes no effort to adjust management activities or evaluate ongoing and future impacts on spotted owls from barred owls.

DNR's contention that evaluating impacts of competition is not feasible (p. 3-221) lacks credibility given the numerous analysis of barred owl effects on spotted owls (see e.g. Forsman et al. 2011; Anthony et al. 2006).

The OESF 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.

Summary:

When the DNR HCP was adopted, it launched a unique project at the Olympic Experimental State Forest. It proposed an experiment and crafted a strategy for integrating protection and conservation across the landscape, based on science and policy of the time. As an experiment, systematic application of new knowledge is a core purpose.

One OESF goal for spotted owls is landscape management for demographic support: “occupancy by successfully reproducing spotted owls that are functional segments of the Olympic Peninsula subpopulation.” Several factors affect this goal, including the spatial distribution, size and connectivity of habitat holding successfully reproducing owls and the scale and impacts of owl threats. While a jumbled 20/40 habitat scheme may have appeared to provide for owl survival and conservation in 1997, a rich body of scientific literature developed since then, including analytical techniques, related to spotted owl biology and demographics, indicates that is no longer the case.

DNR must avail itself of existing demographic models, including MaxEnt model used by the Spotted Owl Implementation Team and others, and evaluate effects of its OESF Plan on spotted owl demography.

The OESF Plan operates on the premise that DNR’s only obligation to owl conservation is defined by the working hypotheses and other HCP script. Given the OESF’s experimental design and adaptive management approach, DNR’s interpretation is not sound. Even if it were, DNR cannot ignore or fail to evaluate in its EIS the rich trove of biological information related to owl biology, demographics and recovery that has been produced since 1997.

The failure to consider and apply best available science informing OESF owl conservation, including barred owl incursion, extreme weather events associated with climate change, importance of nest sites and high-value habitat, landscape habitat patterns and function, the draft salvage logging procedure, proposed changes to habitat definitions, and other factors strongly shaping owl survival and recovery and demographic support of the Olympic owl population, in association with plans to increase fragmentation, degrade, and destroy owl habitat, including nest sites, will have a probable significant adverse environmental impact that was not disclosed in the EIS.

Based on available scientific information, the OESF Plan will considerably reduce chance of owl survival and recovery and not provide demographic support to the Olympic owl population.

Sincerely,

Dave Werntz Conservation Northwest

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# Columbia River Alliance for Nurturing the Environment (CRANE)

Comments Received

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December 10, 2013

**VIA E-MAIL AND U.S. MAIL**

Washington Department of Natural Resources SEPA Center  
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sepacenter@dnr.wa.gov

**Re: Revised Draft EIS on the Olympic Experimental State Forest (OESF) HCP Planning Unit Forest Land Plan (SEPA File No. 10-060101)**

Ladies and Gentlemen:

On behalf of the Columbia River Alliance for Nurturing the Environment ("CRANE"), Perkins Coie respectfully submits the following comments in response to the Washington Department of Natural Resources' ("WDNR") Request for Comments on the Revised Draft EIS on the Olympic Experimental State Forest (OESF) HCP Planning Unit Forest Land Plan. These comments are limited to the approach taken in the Revised Draft's discussion of the threatened Marbled Murrelet.

The Revised Draft proposes that WDNR follow the HCP Marbled Murrelet Interim Conservation Strategy (MMICS) pending completion of the HCP Marbled Murrelet Long-Term Conservation Strategy (MMLTCS). The MMLTCS has already been shown, however, to be inadequate to protect the species against rapid decline associated with continued harvesting without adequate buffer regions. Much stronger protections - including significantly larger buffers - must be implemented pending completion of the MMLTCS.

On July 1, 2013, CRANE submitted comments in connection with the scoping process for the MMLTCS (SEPA File NO. 12-04200 I). Those comments are enclosed with this letter and are incorporated here and reiterated as they apply to the Revised Draft EIS. As noted in those comments, WDNR must implement *enhanced* protective interim measures during the development of the much-delayed MMLTCS in order to ensure that the area's Marbled Murrelet population can recover. Recent studies

estimate that the Marbled Murrelet population in Washington decreased by over 40% between 2000 and 2010, primarily due to loss of nesting habitat and increased predation. Both are consequences of harvesting without adequate buffers.

Since WDNR's interim conservation practices have failed to show the alarming population decline, additional measures are needed to ensure that the already perilous state of the Marbled Murrelet population does not worsen before the MMLTCS is adopted. These measures include expanded buffer regions and protection of all potential Marbled Murrelet ecosystem, not just occupied sites, as discussed in Part D of the attached comments.

Please send any responses or future notifications regarding the EIS on the Olympic Experimental State Forest (OESF) HCP Planning Unit Forest Land Plan to me electronically at: [GHolmes@perkinscoie.com](mailto:GHolmes@perkinscoie.com).

Very Truly Yours,

Grayson Holmes

Attachments

cc: CRANE  
Robyn Thorson, Regional Director, USFWS Pacific Region  
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July 1, 2013

**VIA E-MAIL AND U.S. MAIL**

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**Re: NEPA/SEPA Scoping Comments on Proposed Marbled Murrelet Long-Term Conservation Strategy (SEPA File No. 12-042001)**

Dear Mr. Everett:

On behalf of the Columbia River Alliance for Nurturing the Environment ("CRANE"), Perkins Coie respectfully submits the following comments in response to the Washington Department of Natural Resources' ("WDNR") Request for Comments on the Scope of an Environmental Impact Statement dated May 13, 2013. WDNR's request concerns its proposed development of a long-term conservation strategy ("LTCS") for the threatened Marbled Murrelet (*Brachyramphus marmoratus*) on state trust lands covered by WDNR's 1997 Habitat Conservation Plan ("HCP"). CRANE previously submitted comments on May 21, 2012, during phase one of the scoping process. Those earlier comments discussed the proposed statement of purpose, need, and objectives ("PNO Statement"), as well as facts about the current status of the species and potential effects, all of which CRANE asserts must be considered in developing the LTCS.

CRANE is committed to ensuring the protection and recovery of the Marbled Murrelet throughout its listed range, and is therefore extremely concerned about the continued rapid decline of the population. Recent studies estimate that the Marbled Murrelet population in Washington decreased by over 40% between 2000 and 2010, primarily due to loss of nesting habitat and increased predation (Miller et al. 2012).<sup>1</sup> Ongoing destruction and fragmentation of mature forested areas on non-federal land in Washington contributes to that decline (Raphael et al. 2011). The estimates demonstrate that the interim conservation measures put in place by WDNR's HCP 16 years ago are inadequate to protect the population and contribute to the recovery of the population. A carefully-planned and well-designed

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<sup>1</sup> Appendix I to this letter contains a list of references cited in these comments. A disk with copies of all references available electronically is being delivered to WDNR today along with a hard copy of this letter.

LTCS is necessary to protect and buffer existing nest sites and promote additional growth in areas providing a future beneficial nesting "ecosystem"<sup>2</sup> that will help the population recover. To comply with the Endangered Species Act ("ESA") and the HCP, the LTCS must promote the recovery of the species and protect as large and geographically diverse an area as possible (WDNR 1997 at I.I, IV.44).

WDNR must implement enhanced protective interim measures during the development of the LTCS to ensure that the Marbled Murrelet population can recover. The development of the LTCS has been much delayed, causing significant harm to the population. Sixteen years have passed since the adoption of the HCP and the beginning of WDNR's and USFWS's efforts to craft a LTCS, and there is still no end date for the process. Since WDNR's interim conservation practices have failed to slow the population decline, additional measures are needed to ensure that the already perilous state of the Marbled Murrelet population does not worsen before the LTCS is adopted. These measures include expanded buffer regions and protection of all potential Marbled Murrelet ecosystem, not just occupied sites, as discussed in Part D of these comments.

The National Environmental Policy Act ("NEPA") and the State Environmental Policy Act ("SEPA") require WDNR and USFWS to "[r]igorously explore and objectively evaluate *all* reasonable alternatives" for the LTCS. 40 C.F.R. § 1502.14 (emphasis added); *see also* WAC 197-11-440(5)(b). In determining whether an alternative would be "reasonable," WDNR and USFWS must analyze whether it achieves the objectives of the HCP and LTCS—ensuring the recovery of the Marbled Murrelet. NEPA prohibits the elimination of an alternative simply because it allegedly may not be in the interests of WDNR and the trust beneficiaries. *See City of Carmel-by-the-Sea v. U.S. Dep 't of Transp.*, 123 F.3d 1142, 1155 (9th Cir. 1997). All alternatives that would promote the recovery of the species must be included in the EIS, regardless of the fiscal effects on the trust.

The "conceptual alternatives" for the LTCS identified in WDNR's request for comments achieve none of those goals and are not lawful alternatives. The proposed alternatives all fail to protect an adequate amount of land, do not provide sufficient buffers around occupied sites, and do not address or allow for known gaps in information about the Marbled Murrelet. By failing to include truly protective alternatives, WDNR has illegally placed its trust interests ahead of the species' recovery. An EIS and biological opinion that analyzed just those alternatives would be arbitrary and capricious. WDNR and USFWS must revise the proposed alternatives and examine more protective ones in order to comply with NEPA, SEPA, and the ESA.

Further, WDNR's proposed alternatives are based on outdated and inaccurate data about the location of

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<sup>2</sup> The term "habitat" is ill-defined and often misused (Hall et al. 1997). "Habitat" is sometimes used in the abstract to describe all variables of a particular location that affect species performance. However, studies often measure and assess only the vegetative structure of an area and use the term "habitat" to describe study results, thus attributing multiple, and often conflicting meanings to the same term. To avoid confusion, this letter employs the term "ecosystem" to encompass the full suite of natural conditions present at a given location, including those conditions that result from human activities that affect a particular species within that location. These conditions include, but are not limited to, the presence or absence of predators and competitors, geography, topography, and climate. The word "habitat" is used in these comments only in direct quotes from other sources or in reference to results of studies limited to measurement of vegetative structure.

occupied sites and assumptions about Marbled Murrelet behaviors and threats to the species. Updated and accurate information about, among other things, occupancy, nest predation rates, predator behavior in edge areas, relationships between observed nest density, nesting ecosystem quality, and individual fitness is necessary for informed environmental analyses. To remedy these deficiencies, WDNR and USFWS must conduct additional surveys and update research about those issues and then incorporate that information as they design and implement the LTCS. Failure to do so will render the EIS and biological opinion arbitrary and capricious, in violation of NEPA, SEPA, and the ESA. *See* 16 U.S.C. § 1536(a)(2); 40 C.F.R. § 1502.22.

The conceptual alternatives also improperly fail to include mechanisms for preserving Marbled Murrelet ecosystem while the research to address those knowledge gaps is occurring. WDNR and USFWS must adopt conservative land management practices during the interim, including indefinitely implementing expanded buffers around protected sites and delaying the release of protected sites for harvest. Such measures are vital to ensure that potential ecosystems are available to contribute to recovery of the species. An EIS and biological opinion that fail to include such provisions will be arbitrary and capricious, in violation of NEPA, SEPA, and the ESA.

WDNR also has proposed a "no action" alternative that would involve the agency no longer pursuing HCP coverage for the Marbled Murrelet and instead conducting case-by-case reviews of harvest. This approach would be detrimental to the species and harmful to the Marbled Murrelet. To comply with NEPA, the proper "no action" alternative must be to assume continuation of the current management scheme-the interim conservation strategy in the case of the Marbled Murrelet. *See* 46 Fed. Reg. 18,026, 18,027-28 (Mar. 23, 1981). WDNR will act in an arbitrary and capricious manner if it does not change the "no action" alternative accordingly. Each action alternative also must be modified to include expanded buffers around occupied sites, to incorporate an effective adaptive management scheme, and to protect the Marbled Murrelet Management Areas ("MMAs") delineated in *Recommendations and Supporting Analysis of Conservation Opportunities for the Marbled Murrelet Long-Term Conservation Strategy* ("2008 Science Report") (Raphael et al. 2008). Since these measures will help promote the recovery of the species-the objective of the LTCS-they must be part of the "reasonable alternatives" analyzed in the EIS. It would be arbitrary and capricious to exclude any of them.

These comments (i) set forth legal concerns that must be addressed in creating the LTCS; (ii) provide information regarding the current decline of the Marbled Murrelet population and the lack of knowledge about nest site distribution; (iii) identify gaps in current understanding of Marbled Murrelet population dynamics as related to nesting ecosystem use and predator effects, as well as effects of forest management techniques on current and future nest sites; (iv) address the conceptual alternatives discussed in WDNR's public notice, identifying issues common to all the alternatives and specific concerns regarding particular alternatives-all of which must be addressed to comply with NEPA; and (v) identify elements that must be included in the reasonable alternatives to be analyzed in the EIS. To avoid unlawful agency action, WDNR and USFWS must modify the LTCS and EIS to address these concerns satisfactorily.

#### **A. Legal Deficiencies with WDNR's Approach**

WDNR's approach to date has many legal deficiencies, all of which WDNR must correct to comply

with NEPA and the ESA. The agency has developed three "alternative concepts," which it describes as "three distinct conservation approaches to a long-term marbled murrelet conservation strategy," and is "seek[ing] public comment on the environmental review needed for these Conceptual Alternatives." As discussed in Part D, all of the conceptual alternatives are inadequately protective of the Marbled Murrelet, which, along with the PNO Statement, suggests that WDNR has given its financial interests precedence over its duties under the ESA. The range of Conceptual Alternatives also violates NEPA's requirement to analyze "all reasonable alternatives" in the EIS. To comply with this mandate, WDNR must consider alternatives with more protective measures. Finally, WDNR and USFWS must use the best available science in drafting and implementing the LTCS, meaning that the agencies cannot rely on outdated survey data regarding site occupancy and questionable assumptions about Marbled Murrelet behavior.

Contrary to WDNR's proposals, the agencies must update these data, including conducting additional surveys, and adopt interim conservative measures to ensure the recovery of the species. Failure to rectify all of these concerns will render the EIS and biological opinion arbitrary and capricious under NEPA and the ESA.

#### **1. WDNR's Trust Duties Must Not Override Its Obligations Under the Endangered Species Act.**

Inappropriately, the PNO Statement and proposed conceptual alternatives give more weight to WDNR's financial interests than to its obligations under the ESA. CRANE recognizes that WDNR has fiduciary interests regarding its management of state trust lands; however, those interests cannot trump the agency's obligations under the ESA and HCP, including the requirement to develop an effective LTCS that helps promote the recovery of the Marbled Murrelet.

WDNR must comply with federal law, including the ESA, in its administration of state trust lands, even if it will negatively affect trust beneficiaries. *See Bd of Natural Res. of State of Wash. v. Brown*, 992 F.2d 937, 944--45 (9th Cir. 1993); 1996 Op. Att'y Gen. 11 (1996); *see also Babbitt v. Sweet Home Chapter*, 515 U.S. 687, 698 (1995) (noting that the ESA applies to "all land in the United States and to the Nation's territorial seas"). The agency's trust land management actions are governed by the provisions of the ESA, including the ban on "take" of endangered or threatened species. *See* 16 U.S.C. § 1538(a)(1)(B).

WDNR addressed this limitation by signing the HCP and obtaining an incidental take permit ("ITP"), which authorizes take related to WDNR's otherwise lawful land management activities. *See id* § 1539(a)(2). In choosing that course of action, WDNR considered various alternatives, including not having HCP coverage at all, and found the HCP, its implementation agreement, and the ITP to be "in the best interest of each of the trusts" (WDNR 1997 App. B § 11.0).

WDNR thereby agreed to be bound by the terms of those documents, deeming that approach to be in accordance with its trust interests because the agency would receive legal certainty regarding potential ESA liability in exchange for restrictions on timber sales and other trust-related activities (WDNR

1997 at 11.2 & App. B § 11.0).<sup>3</sup> USFWS issued the ITP based on assurances that WDNR would implement the measures in the HCP, including developing an effective LTCS. *See* 16 U.S.C. § 1539(a)(2); WDNR 1997 App. B § 11.0.

Since 1997, WDNR has relied on the ITP to shield it from ESA liability. That protection applies, however, only as long as WDNR adheres to the requirements of the HCP. The HCP requires WDNR to "minimize and mitigate the impacts of incidental take [on the Marbled Murrelet] to the maximum extent practicable" and to develop and implement a LTCS that will "help meet the recovery objectives of [USFWS], ... and make a significant contribution to maintaining and protecting marbled murrelet populations in western Washington over the life of the HCP" (WDNR 1997 at 1.1, IV.44). For the ITP to continue to remain valid, WDNR must develop and implement a LTCS that meets those objectives.

In summary, in crafting a LTCS, WDNR must focus on how the strategy would benefit the Marbled Murrelet, regardless of the effect on its own pecuniary interests. Failure to do so will make its analyses arbitrary and capricious and violate the ESA, the HCP, and NEPA.

## **2. WDNR Must Analyze All Reasonable Alternatives in the EIS and Must Not Prematurely Limit Its Analysis to the Proposed Conceptual Alternatives.**

It would also be unlawful for WDNR to allow its trust interests or any other non-ESA rationale to restrict the array of alternatives it considers going forward. In the EIS, an agency must "[r]igorously explore and objectively evaluate all reasonable alternatives" regarding a proposed action. 40 C.F.R. § 1502.14; WAC 197-11-440(5)(b). "The existence of reasonable but unexamined alternatives renders an EIS inadequate" under NEPA. *Ilio 'ulaokalani Coal. v. Rumsfeld*, 464 F.3d 1083, 1095 (9th Cir. 2006). WDNR "must look at every reasonable alternative within the range dictated by the nature and scope of the proposal." *Id.* at 1095; *see also* WAC 197-11-786 (defining "reasonable alternative" as "an action that could feasibly attain or approximate a proposal's objectives, but at a lower environmental cost or decreased level of environmental degradation"). It must not "define its objectives in unreasonably narrow terms" so as to avoid consideration of otherwise reasonable alternatives. *City of Carmel-by-the-Sea*, 123 F.3d at 1155.

To comply with the HCP and the ESA, WDNR must design and implement a LTCS that helps ensure the recovery of the Marbled Murrelet. All alternatives that effectively meet that objective would be reasonable, regardless of the effect on trust interests; however, none of the alternatives proposed by WDNR meet that standard. A more narrow attempt to achieve this objective, such as requiring alternatives to have a minimal effect on the trust beneficiaries, would violate NEPA by ignoring WDNR's duties under the ESA. *See Env'tl. Prot. Info. Ctr. v. U.S. Forest Serv.*, 234 F. App'x 440, 444 (9th Cir. 2007) (finding that Forest Service violated NEPA by defining its objectives so narrowly as to ignore the agency's obligations under the Northwest Forest Plan and National Forest Management Act). An EIS for a governmental land management strategy, such as the LTCS, must discuss

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<sup>3</sup> The decision also aligned with WDNR's stated policy goal to "actively participate in efforts to recover and restore endangered and threatened species to the extent that such participation is consistent with trust obligations" (WDNR 1997 at 11.15) (citing Forest Resource Plan policy).

alternatives that would be more protective for the Marbled Murrelet, such as restricting timber activities on "significant" portions of land, along with ones that would allow for more harvesting. See *Or. Natural Desert Ass 'n.v. Bureau of Land Mgmt.*, 625 F.3d 1092, 1124 (9th Cir. 2010) (finding EIS inadequate because Bureau of Land Management failed to consider alternatives that would have closed "significant portions of the land it manages" from off-road vehicles); *State of Cal. v. Block*, 690 F.2d 753, 768 (9th Cir. 1982) (deeming EIS inadequate because it did not consider any alternatives that would have protected more than 33% of lands in question from development). To comply with NEPA, the array of alternatives considered for the LTCS must include more species-friendly options in addition to the less-protective ones discussed in the public notice. See *'Ilio 'ulaokalani*, 464 F.3d at 1095. Such variety is necessary to ensure that WDNR has "sufficiently explored the 'trade-off between wilderness use and development.'" *Or. Natural Desert Ass 'n*, 625 F.3d at 1123 (citing *Block*, 690 F.2d at 767); see also *Solid Waste Alternative Proponents v. Okanogan County*, 66 Wn. App. 439, 444, 832 P.2d 503, 506 (1992) ("The range of alternatives considered in an EIS must be sufficient to permit a reasoned choice.").

In the EIS, WDNR must focus on whether an alternative would help ensure the recovery of Marbled Murrelet and must be confined to alternatives (except perhaps for the no-action alternative) that are population-protective. As discussed in Part D, the conceptual alternatives outlined by WDNR provide inadequate protection for the population and do not accomplish those goals. By concentrating on its narrow array of options, WDNR has excluded reasonable alternatives and ignored its obligations under the ESA, the HCP and NEPA. Such a restriction is impermissible. Agencies conduct scoping to determine, with the input of the general public, the array of issues to be addressed in the EIS for a particular action, the alternatives to be considered, and the criteria that will be used to evaluate those alternatives. See 40 C.F.R. § 1501.7; WAC 197-11-408, 197-11-793; see also USFWS 2010 § 2.3. Here, WDNR has already decided what kinds of alternatives will be analyzed in the EIS, even though it did not seek public comment on possible alternative concepts during the first phase of scoping. The range of reasonable alternatives, as well as their content, has been decided without public input. WDNR's chosen course of action must be informed by the public's critiques and comments, not arbitrarily and capriciously predetermined before those suggestions are offered.

WDNR's current approach does not comply with NEPA. Going forward, WDNR must consider all reasonable LTCS alternatives that would help achieve the objective of ensuring the recovery of the Marbled Murrelet. Moreover, the resulting array of alternatives must include plans that would be more protective to the Marbled Murrelet than any identified in the public notice.<sup>4</sup> The EIS for the LTCS must address all such alternatives to avoid a violation of NEPA.

### **3. WDNR's Long-Term Strategy Must Be Based on the Best Available Science.**

WDNR and USFWS must be vigilant that their analyses are based on the best information available. As noted in Parts B and C of these comments, there are many uncertainties about the location and distribution of the Marbled Murrelet as well as the behavior of and threats to the species. To ensure that there is adequate information about those issues, WDNR and USFWS must undertake additional survey efforts and studies to determine the current status of Marbled Murrelets and the various

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<sup>4</sup> LTCS components that would meet these goals and thus must be incorporated by WDNR into the strategy are described *infra* in Section E.3.

threats posed to them. Such efforts are required to ensure that these knowledge gaps do not inhibit their analyses.

Conducting such additional research is legally mandated. The ESA requires USFWS to utilize the "best scientific and commercial data available" in crafting a biological opinion regarding the potential impact of the LTCS. 16 U.S.C. § 1536(a)(2); *see also Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988) (noting that agencies "cannot ignore available biological information"). Further, WDNR has the obligation under NEPA to determine the credibility of scientific evidence related to a proposed action and to note where existing information is incomplete. *See* 40 C.F.R. § 1502.22. If these missing data are "relevant to reasonably foreseeable significant adverse impacts" related to the action, WDNR must gather the information unless "the overall costs of obtaining it are exorbitant." *Id* Additionally, like USFWS, WDNR cannot rely on outdated data and surveys in analyzing impacts. *See N Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1085-87 (9th Cir. 2011) (finding that environmental impact analysis that relied on "stale data," including ten-year-old aerial surveys, "[id] not constitute the 'hard look' required under NEPA"); *Lands Council v. Powell*, 395 F.3d 1019, 1030-31 (9th Cir. 2005) (finding NEPA analysis inadequate when it relied on "stale habitat data" and outdated population surveys).

Additional population data and information about potential threats to Marbled Murrelets are both relevant to assessing the impacts the various alternatives would have on the species. USFWS and WDNR cannot rely on categorical assertions about the lack of available scientific data, but must actively obtain those data. Additional surveys and updated research on the Marbled Murrelet must occur. Only by undertaking those tasks can WDNR and USFWS ensure that they are making informed decisions and have not violated their duties under NEPA and the ESA.

## **B. Baseline Environmental Conditions**

The listed Marbled Murrelet population is experiencing a rapid decline throughout its listed range, indicating both that significant conservation measures are necessary to recover the species and that current measures are insufficient. WDNR and USFWS must take these conditions into account to ensure that the LTCS complies with NEPA.

The Marbled Murrelet population has declined rapidly of late, even since its 1992 listing as a threatened species under the ESA. *See* 57 Fed. Reg. 45,328 (Oct. 1, 1992). A 2011 report issued by the Washington Department of Fish and Wildlife ("WDFW") and the U.S. Forest Service estimated that the Marbled Murrelet population in Washington State declined at a rate of approximately 7.3% per year between 2001 and 2010 (Pearson et al. 2011). Other recent studies have made similar estimates for the northern (7.4%) and southern (6.5%) halves of the state and noted that those rates were much higher than the estimates for Oregon and California (Miller et al. 2012, Falxa et al. 2011). The decline in Washington paralleled a decline in nesting habitat, suggesting a likely terrestrial mechanism for the decrease (Miller et al. 2012). Scientists have also recognized Southwest Washington as a gap in the distribution of the Marbled Murrelet population, primarily due to the reduced availability of suitable nesting ecosystem in the area (Raphael et al. 2008, McShane et al. 2004). Additionally, a 2012 USFWS Recovery Implementation Team workshop report indicated that a stable Marbled Murrelet population requires a juvenile:adult ratio of at least 0.2, whereas in Washington, this ratio is estimated to be closer

to 0.08 (USFWS 2012). Not surprisingly, based on current estimates, the listed Marbled Murrelet population is at risk of extirpation in the not-too-distant future (McShane et al. 2004).

These declines have occurred in the face of WDNR's actions under the interim conservation strategy. WDNR's timber-sale-related activities have a major effect on the survival and recovery of the Marbled Murrelet. As USFWS has noted, "the loss and modification of nesting habitat (older forests) primarily due to commercial timber harvesting" is the principal threat to the species. 57 Fed. Reg. at 45,328. To reverse these trends, the LTCS must include conservation measures that are more protective than those taken under the interim strategy. The agency must do so to fulfill its obligations under the HCP to meet USFWS's recovery objectives and "make a significant contribution to maintaining and protecting marbled murrelet populations in western Washington" (WDNR 1997 at IV.44). Failure to include these more protective measures in the LTCS will render that strategy, and the related NEPA and ESA documents, arbitrary and capricious.

### **C. Current Knowledge Gaps**

There are numerous gaps in knowledge about Marbled Murrelets and effects of human activities in and near their actual and potential nesting areas. To start, existing information regarding the distribution of the Marbled Murrelet population on a local, nest-site scale is outdated and unreliable. Likewise, there are numerous areas of uncertainty regarding threats to the Marbled Murrelet and the species' likely responses. In order for WDNR to be able to develop a LTCS that is more than merely proscriptive, all of those concerns must be addressed prior to crafting that strategy. In the absence of such information, the EIS and biological opinion will be arbitrary and capricious and violate NEPA, SEPA and the ESA.

#### **1. Current Information About Local Population Distribution Is Outdated and Incomplete.**

Although Marbled Murrelet numbers are dwindling swiftly across Washington, current information about the location and distribution of actual and potential Marbled Murrelet nest sites throughout western Washington is outdated, incomplete, and likely inaccurate. In particular, it is not clear that areas designated by WDNR as "unoccupied" are actually devoid of nest sites; this is because WDNR's surveys demonstrably failed to detect occupied sites. Further, because WDNR's surveys were conducted over ten years ago, areas that were in fact previously unoccupied may have since become occupied. WDNR's comments to date indicate that it does not plan to conduct any additional surveys before developing the LTCS. This is problematic because misidentification of or failure to identify Marbled Murrelet-occupied sites prior to development of the LTCS will lead to implementation of a misguided strategy that does little to protect areas that are necessary for the continued existence of the species. Additional surveys must be conducted and validated with updated protocols in order to support an informed and effective LTCS. The evaluation of alternatives in the EIS must also take these past survey flaws into account.

The inventory surveys WDNR conducted in connection with the interim conservation strategy under the HCP are outdated and incomplete. Within Southwest Washington and the Straits Planning Unit, the surveys were completed a decade or more ago, in 2002 and 2003, respectively (Raphael et al. 2008). WDNR has conducted no additional surveys since then. Even more egregiously, WDNR never

completed its initial survey efforts in other areas covered by the HCP. Inventory surveys in the Olympic Experimental State Forest ("OESF") were discontinued in 2002 before surveys were 75% complete (Raphael et al. 2008). The interim conservation strategy in North and South Puget Planning Units was never fully implemented, and occupancy surveys were not completed (WDNR 2012, WDNR 2009, WDNR 2007). Because inventory surveys were conducted some time ago, survey protocols used are outdated and have since been replaced (Raphael et al. 2008 at App. F). Under these outdated protocols, WDNR often visited sites less than the minimum number of times now recommended for such surveys. *Id*

For instance, subsequent studies of WDNR's inventory survey efforts have shown the problems with those data. The authors of the 2008 Science Report reviewed the data and estimated that 55 survey sites in the OESF and 17 survey sites in Southwest Washington were misclassified by WDNR as unoccupied. *See id* The scientists drafting that report do not appear to have taken their own evaluation of WDNR surveys into account in making recommendations for the LTCS. *See id* Further, a 2003 report by the Washington Department of Fish and Wildlife noted that WDNR's surveys under the HCP interim conservation strategy "are less robust than those endorsed by the WDFW" and recommended more surveying since "WDNR surveys have a lesser probability of detecting occupied sites" (Anthony et al. 2003). For example, WDFW looked at a small set of sites classified by WDNR as unoccupied, and found 78% of those sites were actually occupied by Marbled Murrelets. *See id* Moreover, even WDNR's own earlier review of its survey effort under the interim conservation strategy identified serious concerns with survey accuracy. In particular, surveys conducted by WDFW detected Marbled Murrelet-related occupied behavior at 21 of 22 sites that WDNR had classified as "unoccupied" (Harrison et al. 2003). Oddly, WDNR tried to justify this discrepancy by stating that the WDFW "surveys had the objective of finding occupied sites in order to assure their conservation," even though that should be WDNR's precise aim in conducting its surveys. *Id* WDNR also itself acknowledged that these data problems were widespread, noting that "further surveys at other apparently unoccupied sites would produce similar results throughout the OESF landscape." *Id*

In order to address these obvious inaccuracies with WDNR's survey data, more information regarding the current location of nest sites is required before an effective LTCS can be developed. Additional surveys must be conducted pursuant to updated protocols by an agency or other organization independent of WDNR with sufficient survey experience and demonstrated accurate results. Such surveys will ensure that WDNR and USFWS have fulfilled their mandates under NEPA and the ESA to base their analyses on complete and up-to-date information. It would be arbitrary and capricious to proceed without this necessary information.

## **2. Information About Other Important Considerations Is Also Inadequate.**

As detailed in Section A.1, WDNR is required to develop and implement a LTCS for Marbled Murrelets under the terms of its ITP (WDNR 1997 at IV.44). When USFWS issued the original permit, it approved implementation of an interim conservation strategy for Marbled Murrelets, a solution intended to address the lack of scientific knowledge of the species and to facilitate development of an informed and effective LTCS (WDNR 1997 at IV.39). WDNR itself has recognized that the interim strategy provides only "some unknown level of murrelet conservation ... from not harvesting forest stands where murrelets are suspected of nesting" whereas the long-term strategy must lead to

"intentional conservation ... with measurable objectives for habitat conservation and restoration linked to objectives for murrelet demographic responses. Thoughtful consideration of murrelet population biology and the mechanisms linking it with the environment is a necessary precursor to such an approach" (Harrison et al. 2003 at 13).

Although there are obvious problems with existing survey data regarding Marbled Murrelet population and distribution, WDNR must do more than just address those concerns to ensure that the LTCS is effective. "[A]n effective, efficient conservation strategy will require a much broader understanding of the importance of the structure, composition, and context of forest stands at multiple spatial scales to murrelet population biology." *Id.* at 7. Such an understanding was lacking six years after USFWS approved WDNR's ITP—a point WDNR's own scientists have acknowledged (Harrison et al. 2003)—and the problem has not been remedied in the decade since. Substantial knowledge gaps still remain regarding ecosystem use by and needs of Marbled Murrelets as well as effects of nest predation and fragmentation on the current population. The Marbled Murrelet is an elusive species, making detection and study particularly challenging (McShane et al. 2004). The first Marbled Murrelet nest site was not documented until 1974. *Id.* Considering that the species' average life span is approximately 15 years, new studies of nesting behavior are unlikely to provide any useful long-term conclusions at this point. This lack of information threatens the efficacy of any long-term strategy WDNR eventually adopts, risking the potential extirpation of the listed population. An effective LTCS must protect and buffer sufficient areas of state trust land to support successfully<sup>5</sup> increasing numbers of future nest sites and foster recovery of the species.

The HCP identified research questions regarding the protection of occupied sites that needed to be addressed before designing an effective LTCS.

[W]hile it is easy to assume that protection of occupied sites must be a part of any credible long-term strategy, no one knows how to do this with any certainty of success. Consider the following questions:

Are all occupied sites equally important, or is it possible that murrelets at some sites, such as those below a certain size or farther than some distance from marine waters do not successfully reproduce, making these areas less important to the population?

Once the occupied sites appropriate for protection are identified, exactly what must be done to ensure their longevity? For example, what size protected area is required?

Must a site be a 'no entry' area, or can some management activities take place? Must the area be buffered, and if so, how?

(WDNR 1997 at IV.39). WDNR recognized these questions as exemplifying the large knowledge questions that must be addressed prior to the development of the LTCS. *See id*

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<sup>5</sup> "Successful support" includes not only establishment of a nest and production of an egg, but also hatching of a chick, and fledging of a juvenile without loss to predation.

Many of these questions remain unanswered:

- The current assumptions that identified nesting sites represent "high-quality ecosystem" for the species, and that more-densely-occupied sites are "higher quality" than less-densely-occupied ones, have little evidentiary support; instead, the species' behavior may be more attributable to philopatry, predation, or other factors rather than to an actual preference for those site characteristics. There are similar problems with attempts to link Marbled Murrelet nesting behavior and silvicultural techniques or to tie the "quality" of the ecosystem to species' fitness. These findings all raise doubts about the validity of the habitat-based carrying capacity model.
- Nest predation represents a significant threat to the Marbled Murrelet; however, the effects of fragmentation, particular edge characteristics, and predator behavior with edge areas are not well understood.
- Noise effects, such as from timber harvesting and other anthropogenic sources, negatively affect Marbled Murrelet breeding success and maintenance of the species' population.
- Fragmentation of forest areas has detrimental direct and indirect effects on Marbled Murrelets.

Further, it is uncertain whether existing models about ecosystem quality and distribution are appropriate to use in light of the declining population. As these knowledge gaps suggest, more investigation is required to design a LTCS that will provide enough protection in appropriate locations to make a positive contribution to species recovery. Until these gaps are filled, WDNR must compensate for this uncertainty by developing alternatives that provide extensive protection across large areas of state trust land. Failure to do so will render the EIS arbitrary and capricious, in violation of NEPA.

#### **D. Proposed Conceptual Alternatives**

WDNR's public notice identifies three Conceptual Alternatives, as well as a no-action alternative, and provides cursory descriptions of each. All of these alternatives are inadequate to ensuring the recovery of the Marbled Murrelet and thus are not reasonable alternatives. To comply with NEPA, WDNR must consider a different variety of alternatives, specifically, more protective ones, which would achieve the LTCS objective of helping to ensure the recovery of the species. To aid WDNR in developing lawful alternatives, this section discusses deficiencies in the proposed alternatives, first covering those issues applicable to all of the offered alternatives, followed by specific failures concerning individual alternatives. This letter also identifies LTCS components that WDNR must incorporate in the reasonable alternatives analyzed in the EIS. All of these concerns must be addressed to ensure that WDNR has analyzed all reasonable alternatives and that the EIS is not arbitrary and capricious.

##### **1. Deficiencies Applicable to All Alternatives**

The conceptual alternatives discussed in the public notice share many deficiencies, all of which must all be addressed for the EIS to comply with NEPA. First, WDNR needs to provide more detail about important elements of the alternatives. Second, WDNR must address the aforementioned knowledge

gaps and questionable baseline information, and rely on the best available science, including updated surveys and research, in making decisions about how to manage lands.

**a. WDNR Must Provide Additional Detail To Allow for Better Analyses and More Informed Public Comment.**

The request for comments does not provide the amount of detail about the alternatives required by NEPA and the ESA. The HCP identifies nine issues that must be addressed in crafting an effective LTCS:

"developing a method for defining the perimeter of the breeding area for each occupied site;  
providing sufficient habitat for breeding areas;  
examining the entire landscape within a planning unit to determine which sites are most in need of protection and to consider landscape-level problems;  
reducing fragmentation of remaining nesting habitat;  
providing interior forest conditions;  
providing buffers to minimize the effects of windthrow and microclimate changes within the habitat, to help increase the amount of interior forest provided, and to reduce the amount of edge which has been associated with certain predator species;  
minimizing disturbance at breeding sites during the nesting season;  
preventing the isolation of breeding colonies and maintaining a well-distributed population; and  
protecting all occupied sites in certain critical planning units that have small populations and little remaining habitat."

(WDNR 1997 at IV.43). However, the public notice contains little to no discussion about any of those issues. There is likewise virtually no mention of the following topics: the selection process for protected sites, including the entities making the decisions and the criteria to be used; the enforcement mechanisms to be employed; the length of time for which lands would be protected; and the degree to which adaptive management will be used. These items are all important considerations in ensuring the continued survival and recovery of Marbled Murrelets and must be addressed in crafting and deciding between alternatives.

The EIS must provide more information about those issues so that the public has an opportunity to comment on all aspects of the various alternatives (USFWS 2010 § 2.4(A)(4) ("Each alternative, including the proposed action, must identify the specific actions, operations, and measures to be taken ...")). Such detail is also necessary to guarantee that WDNR and USFWS have based their decisions on the best available information. Failure to provide this additional information will render those agencies' analyses inadequate, arbitrary, and capricious under NEPA and the ESA. *See* 16U.S.C. § 1536(a)(2); *Lands Council*, 395 F.3d at 1027 (noting that NEPA requires there to be "a sufficiently detailed statement of environmental impacts and alternatives so as to permit informed decision making").

**b. WDNR's Alternatives Need To Address Knowledge Gaps and Rely on the Best Available Science in Managing Lands Occupied by Marbled Murrelets.**

To comply with NEPA and the ESA, the LTCS must take into account the numerous knowledge gaps regarding the Marbled Murrelet and contain provisions to address them, including adopting a very expansive definition of "potential Marbled Murrelet habitat." However, the conceptual alternatives do not discuss these defects in any depth, let alone provide any method for addressing them. This absence of information will render the LTCS and EIS arbitrary and capricious, particularly in light of WDNR's earlier admissions about the incompleteness and inadequacy of its data (WDNR 2012, WDNR 2009, WDNR 2007, Harrison et al. 2003). Going forward, the alternatives must include mechanisms to address these issues. Many of the ways that the LTCS could accomplish these goals are discussed elsewhere in CRANE's comments- e.g., additional and/or updated surveys, additional study of threats to the Marbled Murrelet and mechanisms for minimizing and mitigating them, and application of an effective adaptive management policy. WDNR must incorporate those recommendations into the LTCS to avoid a violation of NEPA.

The alternatives inappropriately focus on protecting "known" occupied sites but contain no safeguards to ensure the accuracy of the occupancy data.<sup>6</sup> An effective ecosystem management scheme must focus, at least in large part, on protection of occupied sites. The determination of what sites are actually occupied must be based on rigorous surveys conducted using the methods judged most scientifically accurate. By focusing only on currently-known occupied sites, WDNR and USFWS would be relying on data known to be incorrect, i.e., using inaccurate and outdated data as the foundation for developing an ecosystem management plan. As discussed in Section A.3, reliance on such outdated data is arbitrary and capricious and violates the agencies' duties under NEPA and the ESA. *See* 16 U.S.C. § 1536(a)(2); 40 C.F.R. § 1502.22. Determinations about occupancy must be confirmed by additional surveys before WDNR finalizes the LTCS.

Additionally, none of the alternatives discuss the scientific information that will be used to craft the LTCS. To comply with NEPA and the ESA, WDNR and USFWS must use the best available science in analyzing the impacts of the LTCS and thus must conduct additional population surveys and studies of effects to the species. *See* 16 U.S.C. § 1536(a)(2); *Conner*, 848 F.2d at 1454; 40 C.F.R. § 1502.22. Such information must be included going forward to assess the validity of the scientific data being used. Given the numerous gaps in our current knowledge about the Marbled Murrelet and its presence on WDNR lands, the agencies cannot assume that present understandings about what constitutes "high-quality habitat" are valid. Instead, they must conduct updated studies and design the LTCS based on those results.<sup>7</sup>

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<sup>6</sup> Conceptual Alternative # 1 refers to "known occupied sites," whereas Alternatives #2 and #3 refer just to "occupied sites." It appears that the latter two alternatives would focus on "known" sites as well; however, to the extent that the omission of the word "known" indicates that additional surveys would be conducted as part of those alternatives, such an effort would be appropriate.

<sup>7</sup> Although such studies could take years, the agency cannot rely on this excuse to justify not doing the studies. WDNR has had over 15 years since the adoption of the HCP, and five years since the 2008 Science Report, to gather this necessary information, so issues with the timing of the studies are attributable to WDNR's inaction.

Moreover, the LTCS must take a conservative approach to Marbled Murrelet ecosystem protection while this updated information is being obtained. Only by doing so will WDNR and USFWS have the ability to change management plans in light of newly-obtained knowledge.

USFWS and WDNR must adopt a similar approach so that they can effectively respond to advances in scientific knowledge about the species. The EIS and biological opinion will be arbitrary and capricious, in violation of NEPA and the ESA, if the LTCS alternatives do not incorporate updated scientific information and protective interim measures.

## **2. Deficiencies Regarding Particular Conceptual Alternatives**

The proposed conceptual alternatives provide insufficient protections to ensure the recovery of the Marbled Murrelet, the objective of the LTCS, and thus are not reasonable alternatives under NEPA. The EIS will be arbitrary and capricious if it does not analyze other alternatives and/or remedy the deficiencies in the proposed alternatives. To assist the agencies in crafting detailed alternatives that will actually comply with NEPA, the HCP, and the ESA, CRANE offers the following thoughts about the proposed alternatives.

### **a. Alternative #1**

Conceptual Alternative #1 proposes to protect "known occupied sites" using "variable width buffers," with the goal of "reduc[ing] impacts" from various threats to the Marbled Murrelet, including windthrow, microclimate effects and corvid predators. Although the alternative does not say how many occupied sites would be protected by this approach, other WDNR documents suggest that all such sites would be. Given that this alternative includes no protection for areas other than those surrounding occupied sites and that information about occupancy is unreliable, WDNR must protect all occupied sites<sup>8</sup> in order to help ensure the recovery of the species and have this alternative comply with NEPA, the HCP, and the ESA.

#### **(i) WDNR's Protective Strategies Must Minimize Impacts to Marbled Murrelets, Not Merely Reduce Them.**

WDNR's goal under this alternative is to "reduce impacts" to the Marbled Murrelet, rather than to "minimize" those impacts, as is the case under the other alternatives. This difference, assuming it can be attributed to more than just semantics, will cause significant harm to the species. Aiming merely to reduce impacts to the Marbled Murrelet is a less stringent goal than seeking to minimize those impacts. This shift in emphasis will result in an increased level of adverse impacts to the species, which will correspondingly constrain, and impede, the species' recovery.

This result contravenes WDNR's duties under the ESA and the HCP, rendering this not a reasonable alternative under NEPA. The HCP requires WDNR to "minimize and mitigate the impacts of incidental take to the maximum extent practicable" and to adopt a LTCS that will help ensure the recovery of the

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<sup>8</sup> "All occupied sites" includes all occupied sites, whether or not they were identified by WDNR as part of its incomplete and outdated surveys.

Marbled Murrelet (WDNR 1997 at I.1, IV.44). In order to meet those objectives, the LTCS must minimize impacts to the Marbled Murrelet, not just reduce them. WDNR must reject this conceptual alternative altogether. Including it in the EIS would be unreasonable, arbitrary, and capricious.

**(ii) Occupied Sites Must Be Protected by Large Areas of Contiguous Land, Not Just Variable-Width Buffers.**

This alternative relies on "variable width" buffers to protect occupied sites from various outside threats. According to WDNR officials, this term refers to buffers whose width would vary based on site-specific conditions, i.e., in situations where more threats are expected, the buffer would be larger. The width could vary both within a particular site and between sites.

While this approach theoretically might be viable once WDNR has reliable and sufficient data, it must not be used now. As discussed in Section C.2, nest predation is a serious threat to the continued existence of the Marbled Murrelet (USFWS 2012, USFWS 2009). Buffers around core nesting areas are currently the only known effective method for reducing predator access to a core area (Peery & Henry 2010). However, there still is much uncertainty about the interrelation between edge effects, fragmentation, and corvid behavior, and about the corresponding Marbled Murrelet population responses. Although avoiding fragmentation is almost assuredly helpful, there have been no long-term studies to determine if, how quickly, and to what extent predator populations will continue to expand from edge areas into the forested interior (Malt & Lank 2007).

Given this lack of knowledge, it is premature, arbitrary, and capricious, to make assumptions about the threats posed to particular sites and the amount of buffer needed to protect against incursions. As noted in Section C.2, WDNR and USFWS must conduct further research on this topic and incorporate the resulting knowledge into the LTCS. Until the relationship among predator abundance, edge areas, and nest success is better understood, buffer widths surrounding Marbled Murrelet nesting ecosystems must be sufficiently wide to account for potentially devastating predator effects. To accomplish this, buffer widths that exceed the great majority of the home range of the chief corvid predators must be used. Should WDNR and USFWS use variable width buffers, the minimum width must be at least as large as that amount.<sup>9</sup> Using a smaller width will not achieve the objectives of the LTCS and therefore will violate NEPA, the HCP, and the ESA.

**b. Alternatives #2 and #3**

Under both Conceptual Alternative #2 and Conceptual Alternative #3, WDNR "would protect most or all occupied sites from forest management activities and provide functioning buffers to minimize" various threats to the Marbled Murrelet. WDNR also would "create Conservation Areas, as needed, to mitigate for impacts to marbled murrelet habitat." Conceptual Alternative

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<sup>9</sup> Corvids are known to increase their home range in the presence of human activities. Crows have exhibited home ranges over 8,000 hectares, and made long unidirectional flights of tens of kilometers to gain access to human sites for feeding. Ravens exhibit home ranges of approximately 2,800 hectares. Steller's Jays have a home range of approximately 60 hectares (Marzluff & Neatherlin 2006). Assuming these observed home ranges, once corvids are attracted to a thinned or clearcut edge area by human activity or new food sources and nesting sites, they can travel anywhere from approximately 1,430 to 16,550 feet in any direction in search of food.

#2 would locate those Conservation Areas in "strategic locations in Southwest Washington, the Olympic Experimental State Forest (OESF), and the North Puget Planning Unit." Conceptual Alternative #3 would locate those areas "primarily in Southwest Washington," with some additional areas possibly located in the North Puget Planning Unit.

WDNR does not discuss how Conservation Areas would be designated or provide specifics about their number, location, or size. Such information is vital to analyzing the potential effectiveness of the LTCS and must be included for the EIS to comply with NEPA.

**(i) WDNR Must Protect All, Not Just "Most," Occupied Sites and Must Commit To This Level of Protection.**

Neither of these alternatives specify the amount of occupied sites that will be protected, merely stating that "most or all" of those sites would be protected. WDNR must protect all, not just most, of the occupied sites for the lifetime of the HCP. As discussed in Section C.1, historical surveys failed to identify a large number of occupied sites with Washington. Even if WDNR protects all of the sites it currently knows to be occupied, it would be protecting only a fraction of the actual occupied sites, possibly even less than half. Protecting most of the known occupied sites would result in an even smaller number being protected. This outcome would be less than that required by the ESA and the HCP, would be detrimental to the Marbled Murrelet population as a whole, and would impede the recovery of the species, in violation of WDNR's legal duties under the HCP and NEPA (WDNR 1997 at I.I, IV.44).<sup>10</sup> To ensure compliance with those acts, the LTCS must commit to protecting all occupied sites.

Moreover, the proposed alternatives do not require WDNR to maintain a certain amount of protection, meaning that it could initially protect all occupied sites and later decide to protect just 55% of them. This potential variability violates the HCP's goals of ensuring certainty and stability to the Marbled Murrelet and other wildlife (WDNR 1997 cover letter). As a result, these alternatives do not meet the objectives for the LTCS. The EIS will be arbitrary and capricious, and violate NEPA, the HCP, and the ESA, unless WDNR commits to protecting all occupied sites for the lifetime of the HCP.

**(ii) WDNR Must Employ Buffers of Sufficient Width To Protect Against Predation and Other Threats.**

Both of these alternatives provide inadequate detail about the protections that would be used, merely noting that "functioning buffers" would be employed around occupied sites, with no indication of what makes a buffer "functioning." This absence of information makes it difficult to comment on this aspect of the alternatives. To comply with NEPA, the agencies must provide additional detail to allow for informed public comment and full analysis of impacts.

Until the relationship among predator abundance, edge areas, and nest success is better understood,

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<sup>10</sup> The HCP anticipated that the LTCS "would protect the vast majority of occupied sites," at a minimum (WDNR 1997 at IV.44). Given the large number of unknown occupied sites, protecting all known occupied sites is the only way to be sure that the LTCS meets that goal.

buffer widths surrounding Marbled Murrelet nesting ecosystems must be sufficiently wide to account for potentially devastating predator effects. A buffer should be deemed "functioning" only if its width exceeds the great majority of home ranges of the chief corvid predators around the occupied site, as discussed above for Conceptual Alternative #1. Adopting smaller buffers will render the LTCS, biological opinion, and EIS, arbitrary and capricious.

**(iii) WDNR Must Provide Further Information on the Protections Employed at "Conservation Areas"**

WDNR's public notice does not explain what mechanisms would be used to ensure the long-term protection of the Conservation Areas. Relevant details include the activities that would be permitted to occur in those areas, the management techniques that would be employed, and the permanency of protective measures. WDNR and USFWS must provide more information about those and other protection-related issues so that they will have the benefit of informed public comment and be able to fully analyze the impacts of these alternatives.

To comply with NEPA, WDNR must provide at least the same level of protection to "Conservation Areas" that it accords to "Natural Area Preserves." WDNR generally limits public access to those sites to ensure protection of resources located within. *See* RCW 79.70.010 *et seq.* This enhanced level of protection would limit the harm caused to the Marbled Murrelet by known threats related to human encroachment, such as predation and noise, and will ensure that potential nesting sites will contribute to the recovery of the Marbled Murrelet—the objective of the LTCS. Applying a lesser level of protection would be arbitrary and capricious.

**(iv) WDNR Must Focus on the Quality and Quantity of Murrelet Habitat in Selecting Sites for Conservation Areas, and Must Utilize the Best Available Science.**

WDNR's public notice says that, under Alternative #2, Conservation Areas would be located in "strategic locations" and that those "strategic locations ... would be identified considering distance to higher quality marine foraging areas, the size and proximity of occupied sites, the level of murrelet activity within occupied sites, and the amount of murrelet habitat." Alternative #3 contains the same description, with the exception of substituting "quantity and quality of murrelet habitat" for "amount of murrelet habitat."

When selecting sites for Conservation Areas, WDNR must focus on the quantity and quality of the ecosystem for the Marbled Murrelet. As discussed in Section C.2, all potential ecosystems may not be created equal. Protecting a larger number of acres of "habitat" is not the best approach for promoting the recovery of the Marbled Murrelet. Instead, the LTCS must protect as much high-quality ecosystem as possible.

In making these determinations, WDNR must satisfactorily address the issues discussed in Part C regarding Marbled Murrelet ecosystem quality and population distribution. In light of those issues, WDNR must adopt a conservative approach to preserve high-quality ecosystem for the long-term. For example, until additional research and surveys are conducted, WDNR must create Conservation Areas that are both larger in size and greater in number than may ultimately be needed, thereby ensuring that

enough lands will be available to implement the new findings. Likewise, WDNR must delay the release of, and limit timber-harvesting activities on, potential nesting sites during that same period to minimize the amount of damage to those lands. Not incorporating such protective measures will render the EIS arbitrary and capricious because it would not achieve the objectives of the LTCS.

**(v) WDNR Must Not Exclude the OESF, Straits, and South Puget Planning Units as Potential Sites for Conservation Areas.**

Under both Alternatives #2 and #3, there would be no Conservation Areas located in the Straits and South Puget Planning Units, and under Alternative #3, there would be none in the OESF as well. These exclusions are not in line with WDNR's duties under the ESA and the HCP and therefore must not be part of the LTCS. The HCP repeatedly emphasized the importance of maintaining a well-distributed Marbled Murrelet population and of protecting areas within each Watershed Analysis Unit (WDNR 1997 at IV.42 to IV.44). To accomplish that goal, WDNR must seek to have the most geographically diverse set of protected lands possible and not categorically eliminate certain locations from consideration as potential Conservation Area sites. To do otherwise would violate WDNR's duty under the HCP to ensure the LTCS helps support the recovery of the species and thereby make the LTCS and EIS arbitrary and capricious.

Although Southwest Washington and the North Puget Planning Unit may represent the best opportunity for siting Conservation Areas, focusing solely on those areas (as well as OESF in Alternative #2) is not in the best interest of the species. Locations in the Straits, South Puget, and OESF Planning Units could serve as valuable present or future nesting sites for the Marbled Murrelet. Given the potential distributional benefits of protecting locations in those units, WDNR must not exclude them from the list of potential Conservation Area sites.

The exclusion of the OESF and South Puget Planning Units is particularly troubling. The 2008 Science Report has already identified Marbled Murrelet Management Areas ("MMMA") in the OESF that could serve as good locations for developing high-quality Marbled Murrelet ecosystem (Raphael et al. 2008). Those recommendations must be incorporated into WDNR's approach. Moreover, it makes no sense for WDNR to extol the virtues of having Conservation Areas in the OESF, as it does in Alternative #2, and then to omit any mention of that planning unit when discussing Conservation Areas in Alternative #3. As for the South Puget, WDNR has never finished population surveys in that unit (WDNR 2012, WDNR 2009, WDNR 2007), so the agency has an incomplete picture of Marbled Murrelet distribution and potential Conservation Area sites there. WDNR must not prematurely eliminate the area from consideration until it has updated and completed occupancy surveys. For the EIS to comply with NEPA, those two areas, as well as the Straits Planning Unit, must be included as potential sites for Conservation Areas.

**c. "No Action" Alternative**

WDNR's proposed "no action" alternative would have the agency stop seeking HCP coverage for the Marbled Murrelet and instead "follow existing regulations that apply to marbled murrelet habitat, including current Forest Practices rules and the Endangered Species Act." Under this approach, WDNR would not adhere to the interim conservation strategy and would not have coverage for the

Marbled Murrelet under the ITP issued by USFWS, and instead "would conduct a case-by-case review of its harvests and other activities in marbled murrelet habitat." This alternative is not reasonable nor is it the appropriate "no action" alternative. To comply with NEPA, WDNR must analyze the interim conservation strategy as the "no action alternative."

**(i) The "No Action" Alternative Must Involve Continuation of the Interim Conservation Strategy.**

The range of alternatives analyzed in an EIS must include an "alternative of no action." 40 C.F.R. §§ 1502.14(d), 1508.25(b)(1). "A no action alternative in an EIS allows policymakers and the public to compare the environmental consequences of the status quo to the consequences of the proposed action." *Ctr. for Biological Diversity v. US. Dep 't of Interior*, 623 F.3d 633, 642 (9th Cir. 2010). "The no action alternative is meant to provide a baseline against which the action alternative" may be compared. *Id.* (internal citation and quotation omitted). Although there is no statutory definition of "no action" alternative, it is generally understood to mean "continuing with the present course of action until that action is changed." 46 Fed. Reg. 18,026, 18,027 (Mar. 23, 1981). In the case of updating land management programs, such as the HCP, the "no action" alternative would assume that "ongoing programs initiated under existing legislation and regulations will continue" and that there would be "no change" from current management direction." *Id.* at 18,028.

In this instance, the proper "no action" alternative is to assume continuation of the interim conservation strategy. That is the current management scheme for the Marbled Murrelet pending the approval of a LTCS (WDNR 1997 at IV.39 to IV.40). Although the interim strategy was not conceived as a permanent solution, it would still remain in place if no LTCS was developed. In such a situation, WDNR could withdraw from HCP coverage voluntarily or at USFWS's request, but WDNR must not assume that either action would occur. *See Am. Rivers v. F.E.R.C.*, 201 F.3d 1186, 1200 (9th Cir. 1999) (deeming it proper, in the case of a NEPA analysis of a hydropower license renewal, to have the "no action" alternative be continued operation under the existing license rather than cancellation of the existing license, i.e., no operation). To base a "no action" alternative on such assumptions would violate NEPA.

Moreover, the interim conservation strategy provides a better baseline against which to measure the effects of the various action alternatives. As discussed in more detail in the next subsection, the Marbled Murrelet is almost certain to experience significant take in the absence of HCP coverage. The interim strategy, by contrast, provides more protection by forbidding activities in certain lands believed to represent potential Marbled Murrelet ecosystem (WDNR 1997 at IV.39 to IV.40). Any action alternative would look better when measured against the former rather than the latter, even if there were relatively few actual environmental benefits to that approach. At the very least, this discrepancy indicates that the interim conservation strategy must be considered as an alternative in the EIS, whether as an action alternative or a "no action" alternative.<sup>11</sup> To ignore this reasonable alternative would render the EIS arbitrary and capricious.

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<sup>11</sup> Some agencies have examined multiple "no action" alternatives. See *Conservation Nw. v. Rey*, 674 F. Supp. 2d 1232, 1244 (W.D. Wash. 2009).

**(ii) The Proposed "No Action" Alternative Would Cause Take, Be Detrimental to the Marbled Murrelet, and Not Be in WDNR's Interest.**

This alternative, as described, would likely doom the Marbled Murrelet population in the listed area. It is not in the interest of the protected species, and it is not in the interest of WDNR or USFWS. In entering the HCP, WDNR committed to creating a LTCS for the Marbled Murrelet and otherwise supporting USFWS's efforts to ensure the recovery of the species (WDNR 1997 at IV.44). By withdrawing from the HCP, and thereby losing coverage for the Marbled Murrelet under the ITP, WDNR would be not only deliberately shirking those commitments but also actively impeding USFWS's efforts to protect the species. To treat this as a viable option would violate NEPA and the ESA.

If WDNR withdrew from HCP and ITP coverage for the Marbled Murrelet, it would be subject to the non-HCP requirements of the ESA, including the prohibition against take, which it would likely violate. *See* 16 U.S.C. § 1538(a)(1)(B), (G). Timber harvests are known to be a major mechanism behind the population decline of the Marbled Murrelet (USFWS 2012, Raphael et al. 2011). As a result, WDNR's timber-related activities would almost certainly result in take, especially given the breadth of actions considered "take" under the ESA. *See* 16 U.S.C. § 1532(19) (defining "take" to include activities that "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" protected species); 50 C.F.R. § 17.3 (indicating that "significant habitat modification or degradation" would constitute "harm" for purposes of "take" definition).

The threat of such take would result in uncertainty not only for the species but also for WDNR. Given the inadequate survey information, WDNR may not know whether a particular timber sale or forest practice activity would result in harm to Marbled Murrelets. Moreover, should such take occur, the agency would likely have to pay fines or penalties to the government and defend citizen suits from private parties—neither of which are results WDNR or the trust beneficiaries would welcome. The present situation in Oregon is illustrative. There the state agencies overseeing timber sales, the State Land Board and Oregon Department of Forestry, abandoned efforts to obtain HCPs for three state forests in 2009. Various groups sued the agency for unauthorized take and other ESA violations in those locations. The court has entered a preliminary injunction forbidding all timber sales in those areas pending the outcome of the suit. *See Cascadia Wildlands v. Kitzhaber*, 3:12-CV-00961-AA, 2012 WL 5914255 (D. Or. Nov. 19, 2012). It is distinctly possible that no timber sales will occur in those regions until the state agencies obtain an ITP. Were that to occur here, WDNR's timber sale revenues would decrease and might even stop, and it would be difficult for the agency to plan timber sales going forward, seemingly bad results for both the agency and trust beneficiaries.

In addition to creating uncertainty for WDNR, abandoning the HCP would call into question many of WDNR's own commitments and policy goals. As noted in Section A.1, WDNR has committed to "actively participat[ing] in efforts to recover and restore endangered and threatened species" (WDNR 1997 at 11.15) (citing Forest Resource Plan policy). Abandoning an effort to promote the long-term recovery of the Marbled Murrelet directly flouts that goal. Moreover, for WDNR to shirk its responsibilities to the Marbled Murrelet suggests that it could do the same for all of its

other commitments in the HCP, such as those for the Northern Spotted Owl. By signing the HCP, WDNR agreed to pursue all of those efforts, not just those it deems convenient. Furthermore, since WDNR found that entering the HCP was consistent with its trust obligations (WDNR 1997 App. B § 11.0), withdrawing from HCP coverage for the Marbled Murrelet would violate those obligations, especially given the uncertainty and lack of flexibility WDNR would experience without such coverage.

### **3. Additional Components That Must Be Included in the LTCS**

NEPA requires WDNR to "[r]igorously explore and objectively evaluate *all reasonable alternatives*" in the EIS. 40 C.F.R. § 1502.14 (emphasis added). The choice of alternatives to be analyzed in an EIS is guided by the "rule of reason" as well as the underlying purpose and need for the project. *See City of Carmel-By-The-Sea*, 123 F.3d at 1155. Pursuant to these requirements, WDNR must craft alternatives other than those identified in the public notice, providing alternatives that comply with the stated project purpose, i.e., helping to ensure the recovery of the Marbled Murrelet.

This section discusses three components of a LTCS that WDNR has yet to consider but which would help meet those stated project purposes and must be part of any LTCS alternative. First, within Southwest Washington and elsewhere, WDNR must focus on protecting those lands identified as MMMA's in the 2008 Science Report. Second, WDNR must delay the release of potential Marbled Murrelet ecosystem to ensure the species has time to recover from the loss of those lands. Third, WDNR must employ *effective* adaptive management techniques as part of the EIS. These components must be part of the "reasonable alternatives" that will be considered and analyzed in the EIS. WDNR will act unlawfully if it does not include them all in every "action" alternative.

#### **a. Protection of Marbled Murrelet Management Areas Within Southwest Washington and the OESF**

In crafting the LTCS alternatives, WDNR must protect those areas within Southwest Washington and the OESF that the 2008 Science Report identified as potential MMMA's (Raphael et al. 2008). Those sites are "[a]reas of the landscape that have the ability to provide future potential nesting habitat" and which scientists agree should be managed to create high-quality nesting "habitat." *Id.* at ES-11. The MMMA's were intended to "provide the foundation for a credible, science-based LTCS" (Raphael et al. 2008 at 3-1). WDNR requested these recommendations and must not easily dismiss them, as it has on other occasions, as allegedly inconsistent with its trust interests. Developing and implementing a LTCS that "make[s] a significant contribution to maintaining and protecting marbled murrelet population" is consistent with those interests (WDNR 1997 at IV.44). WDNR's trust interests cannot outweigh legal obligations it has under the HCP and ESA, including that requirement. Furthermore, within Wahkiakum and Pacific Counties, the MMMA's were crafted with particularly close attention to revenue generation, so a LTCS that protected MMMA's in those counties would be consistent with trust interests (Raphael et al. 2008 at 3-1).

Conservation of the MMMA's would help achieve the purposes of the LTCS, and thus must be analyzed as part of the alternatives in the EIS; however, those alternatives must not focus exclusively on protecting MMMA's since such an approach would concentrate the Marbled Murrelet population in

particular areas. That outcome would not achieve the HCP's goal of a Marbled Murrelet population that was well-distributed statewide (WDNR 1997 at IV.43) (stating that one of the goals of the LTCS is "preventing the isolation of breeding colonies and maintaining a well-distributed population"). In order to comply with NEPA's requirement to analyze all reasonable alternatives, WDNR must include MMMA protection as part of an alternative that protects other areas as well. The EIS will be arbitrary and capricious if it does not include this alternative.

**b. Delay in the Release of Any Potential Marbled Murrelet Ecosystem To Ensure Species Recovery**

Some of the alternatives to be analyzed in the EIS may involve releasing occupied sites or reclassified Marbled Murrelet "habitat." To combat the potential effects of such an action, WDNR must postpone the release date of such lands by at least 15-20 years. This delay is necessary to provide sufficient time to mitigate the harm to the species from losing actual or potential nesting areas and to allow WDNR to confirm that its conservation efforts are having the predicted effect. WDNR must adopt this approach for blocks of land as well as the enhanced buffers-i.e., buffers with widths exceeding the great majority of the home ranges of the chief corvid predators-that must be enforced around protected sites. Those expanded buffers can be reduced, and the land released for harvest, should additional research reveal that smaller buffers are sufficient to protect against threats from corvids and noise effects.

This delayed release is necessary given the many uncertainties about the needs of the Marbled Murrelet and the risks posed to the species. WDNR would thereby retain the flexibility to utilize those lands for any additional protections that may ultimately prove necessary to help ensure the recovery of the species. It would be much worse for the Marbled Murrelet to have belatedly realized that insufficient land was initially protected than to have delayed the release of land that was covered under an initially overprotective approach. These protections will ensure the recovery of the species. WDNR would violate NEPA and the ESA if it omitted them from the LTCS.

**c. Implementation of an Effective Adaptive Management Plan**

Along with the delayed release of potential Marbled Murrelet ecosystem, the LTCS must incorporate an effective adaptive management strategy to respond to the extensive uncertainties about Marbled Murrelet nest site locations, nest site selection and nesting ecosystem quality, levels of predation in edge areas, effects of silvicultural techniques, and other topics. *See* 65 Fed. Reg. 35,242, 35,252 (June 1, 2000) (deeming such a strategy to be "essential for HCPs that would otherwise pose a significant risk to the species at the time the permit is issued due to significant data or information gaps").

The adaptive management plan included in the LTCS must take a conservative approach to protecting the Marbled Murrelet in light of the species' declining population status and the high level of uncertainty about effects on the species. WDNR must initially take all precautions currently believed necessary to stabilize the population. After a reasonable amount of time, those measures would be modified if the population has not stabilized or if it has stabilized and interim studies indicate that not all of the measures are still needed. The LTCS also must incorporate ongoing monitoring and active adaptive management protocols, ensuring continual assessment and response to the implementation

of the strategy. It is not enough simply to adopt a static LTCS and hope for the best. Adaptive management measures must be enforceable and not entirely discretionary. *See Natural Res. Def Council v. Kempthorne*, 506 F. Supp. 2d 322, 352-56 (E.D. Cal. 2007) (holding adaptive management plan arbitrary and capricious because it did not provide any certainty that necessary mitigation would be implemented, and noting "overly flexible adaptive management may be incompatible with the requirements of the ESA").

The adaptive management plan will be effective only if, when constructing the LTCS, WDNR anticipates problems that may arise in a management regime and provides mechanisms to detect and correct problems that persist. Such mechanisms include adopting protocols that take into account both the short-term and long-term needs of the population, incorporating high levels of protection for large areas of nesting ecosystem, and conducting a sufficient number of surveys to detect changes in the Marbled Murrelet population size over the life of the LTCS (Boulanger et al. 1999). All of those elements are necessary components of the adaptive management plan and must be included to comply with NEPA and the ESA.<sup>12</sup>

If WDNR fails to include an effective adaptive management plan in the LTCS, the strategy will not achieve the ESA-mandated goal of helping to promote the survival and recovery of the Marbled Murrelet. Such a result would render the LTCS, the EIS, and the biological opinion arbitrary and capricious, in violation of NEPA and the ESA.

## **E. Conclusion**

WDNR's and USFWS's proposed conceptual alternatives prematurely restrict the NEPA analysis, improperly rely on outdated or incomplete data and assumptions, and do not sufficiently protect the Marbled Murrelet. This approach fails to comply with the agencies' legal obligations under NEPA, SEPA, and the ESA.

WDNR's current Marbled Murrelet survey data are outdated and inaccurate; more surveys are needed before development of a LTCS. There are likewise considerable gaps in knowledge of Marbled Murrelet ecology, including nesting ecosystem selection, predation effects, and responses to silvicultural techniques. WDNR and USFWS must conduct additional studies on all those matters. The alternatives evaluated in the EIS must address and account for these significant uncertainties, as well as the declining population status, by providing high levels of protection for Marbled Murrelets across state trust land. Current timber management practices and ineffective buffer areas implemented by WDNR are insufficient to promote conservation of the species. Significant additional protections are needed to benefit the species over the long-term.

The conceptual alternatives proposed by WDNR and USFWS arbitrarily and capriciously ignore all of these concerns. These deficiencies must be adequately addressed in the EIS and biological opinion; otherwise, the agencies will violate NEPA, SEPA, and the ESA.

Please send any responses or future notifications regarding availability of the draft EIS to me

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<sup>12</sup> Although the 2008 Science Report discusses adaptive management, it would not be an effective model, since that plan discusses none of these goals (Raphael et al. 2008).

electronically at GHolmes@perkinscoie.com.

Very truly yours,  
Grayson Holmes

Attachments

cc: CRANE  
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July 1, 2013

VIA U.S. OVERNIGHT MAIL

Aaron Everett  
Washington Department of Natural Resources SEPA Center  
P.O. Box 47001  
Olympia, WA 98504-7001

Re: Cited References for NEPA/SEPA Scoping Comments on SEPA File No. 12-042001

Dear Mr. Everett:

On behalf of the Columbia River Alliance for Nurturing the Environment ("CRANE"), enclosed please find a CD-ROM containing electronic copies of references cited by CRANE in its July 1, 2013 scoping comments for the joint Environmental Impact Statement for the Washington Department of Natural Resource's development of a Long Term Conservation Strategy for the Marbled Murrelet under its 1997 Habitat Conservation Plan (SEPA File No. 12-042001). A copy of CRANE's scoping comments is enclosed as well, though they also have been submitted electronically to the SEPA Center under separate cover. Please let me know if you have any questions.

Very truly yours,

Grayson Holmes  
Enclosure

## APPENDIX 1

### References Cited in CRANE Comments on SEPA File No. 12-042001 (July 1, 2013)

Doc. # on Disk	Reference
1	ANTHONY, J.L. ET AL., TERRESTRIAL SURVEYS OF MARBLED MURRELETS IN THE PACIFIC COASTAL REGION OF THE WESTERN OLYMPIC PENINSULA AND SOUTHWEST WASHINGTON 2001-2002, WASHINGTON DEPARTMENT OF FISH AND WILDLIFE REPORT TO THE TENYO MARU OIL SPILL TRUSTEE COMMITTEE (2003), available at <a href="http://www.darrp.noaa.gov/northwest/tenyo/pdf/ten-mmfnl0203.pdf">http://www.darrp.noaa.gov/northwest/tenyo/pdf/ten-mmfnl0203.pdf</a> .
2	Boulanger, J. et al., Evaluating uncertainty in estimating population trends of Marbled Murrelets, in SOCIETY OF CANADIAN ORNITHOLOGIST SPECIAL PUBLICATION NO. 1: BIOLOGY AND CONSERVATION OF FOREST BIRDS, 53 (1999), available at <a href="http://www.sco-soc.ca/Special.pdf#page=60">http://www.sco-soc.ca/Special.pdf#page=60</a> .
3	FALXA, G., ET AL., MARBLED MURRELET EFFECTIVENESS MONITORING, NORTHWEST FOREST PLAN: 2009 AND 2010 SUMMARY REPORT (2011), available at <a href="http://www.reo.gov/monitoring/reports/murrelet/MAMU_2009-2010_EM_Annual%20Monitoring%20Report.pdf">http://www.reo.gov/monitoring/reports/murrelet/MAMU_2009-2010_EM_Annual%20Monitoring%20Report.pdf</a> .
4	Hall, L. S. et al., The habitat concept and a plea /or standard terminology, 25 WILDLIFE Soc'Y BULLETIN 173 (1997), available at <a href="http://wildlifehabitat.tamu.edu/Lessons/Habitat-Concepts-1/Readings/The-habitat-concept-and-a-plea-for-standard-terminology.pdf">http://wildlifehabitat.tamu.edu/Lessons/Habitat-Concepts-1/Readings/The-habitat-concept-and-a-plea-for-standard-terminology.pdf</a> .
5	HARRISON, P., ET AL., WASHINGTON DEPARTMENT OF NATURAL RESOURCES: INLAND MARBLED MURRELET SURVEYS IN THE STRAITS PLANNING UNIT, 2000-2002 (2003), available at <a href="http://www.dnr.wa.gov/Publications/lm_mamu_harrison.pdf">http://www.dnr.wa.gov/Publications/lm_mamu_harrison.pdf</a> .
6	Malt, J. & D. Lank, Temporal dynamics of edge effects on nest predation risk for the Marbled Murrelet, 140 BIOLOGICAL CONSERVATION 160 (2007), available at <a href="http://www.sfu.ca/biology/wildberg/papers/Malt&amp;LankBiolCons07.pdf">http://www.sfu.ca/biology/wildberg/papers/Malt&amp;LankBiolCons07.pdf</a> .
7	Marzluff, J.M. & E. Neatherlin, Corvid response to human settlements and campgrounds: Causes, consequences, and challenges for conservation, 85 ECOLOGY 1411 (2006), available at <a href="http://www.sefs.washington.edu/research.acl/Crows_and_Other_Corvids/marzluff_neatherlin_bioconx.pdf">http://www.sefs.washington.edu/research.acl/Crows_and_Other_Corvids/marzluff_neatherlin_bioconx.pdf</a> .
8	MCSHANE, C., ET AL., EVALUATION REPORT FOR THE 5-YEAR STATUS REVIEW OF THE MARBLED MURRELET IN WASHINGTON, OREGON, AND CALIFORNIA, PREPARED FOR: U.S. FISH AND WILDLIFE SERVICE, REGION 1 (2004), available at <a href="http://www.fws.gov/oregonfwo/species/data/marbledmurrelet/documents/2004fiveyearreviewreport.pdf">http://www.fws.gov/oregonfwo/species/data/marbledmurrelet/documents/2004fiveyearreviewreport.pdf</a>
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Doc. # on Disk	Reference
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15	UNITED STATES FISH AND WILDLIFE SERVICE, DRAFT FISH AND WILDLIFE SERVICE MANUAL PART 550, CHAPTERS 1 & 2 (2010), available at <a href="http://www.fws.gov/r9esnepa/draft%20550a.htm">http://www.fws.gov/r9esnepa/draft%20550a.htm</a> .
16	UNITED STATES FISH AND WILDLIFE SERVICE, MARBLED MURRELET: 5-YEAR REVIEW (2009).
17	WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES, LTCS Public Scoping PowerPoint April 30, 2012: Marbled Murrelet Conservation Strategy (2012).
18	WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES, Letter from Tami Miketa, Assistant Division Manager Ecosystem Services Section, Washington Department of Natural Resources, to Ken Berg, Manager, Washington Fish and Wildlife Office (July 16, 2009).
19	WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES, Letter from Tami Miketa, Assistant Division Manager Ecosystem Services Section, Washington Department of Natural Resources, to Ken Berg, Manager, Washington Fish and Wildlife Office (February 23, 2007), in DNR PROPRIETARY HCP IMPLEMENTATION AGREEMENT FOR THE MARBLED MURRELET, 2008 FIVE WEST-SIDE AND THE OESF PLANNING UNITS (2008).
20	WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES, FINAL HABITAT CONSERVATION PLAN (1997), available at <a href="http://www.dnr.wa.gov/ResearchScience/Topics/TrustLandsHCP/Pages/Im_hcp_trust_lands_report.aspx">http://www.dnr.wa.gov/ResearchScience/Topics/TrustLandsHCP/Pages/Im_hcp_trust_lands_report.aspx</a> .

# Forks, City of

## Comments Received

16 Dec 2013  
Washington State Department of Natural Resources SEPA Center  
1111 Washington St. SE  
MS: 47015  
Olympia, WA 98504-7015

RE: DEIS for the Olympic Experimental Forest Land Plan

The City of Forks submits the following comments for consideration by the Department of Natural Resources regarding the Olympic Experimental Forest Land Plan.

First, DNR and its staff deserve to be commended for bringing forth both a Draft Environmental Impact Statement (DEIS) and also the actual Forest Land Plan (FLP) for the Olympic Experimental State Forest (OESF). The fact that the FLP has been produced is a significant milestone not only within the OESF, but also within the framework of the DNR's Habitat Conservation Plan (HCP), and also within the history of the Department itself. The Commissioner and his staff deserve to be commended for making this occur in spite of the tremendous level of challenges that they have had to overcome.

Second, the DNR staff that developed these documents also deserve to be commended for ensuring that the FLP and much of the DEIS is presented in a very readable and educational manner. While there is an excessive reliance on appendixes that are both complex and very technical in nature, the FLP and its associated DEIS are written in a straight forward and readable form making it a document that helps ensure a common usage of language and information. One of the quickest examples of this approach is found on page ES-5 of the DEIS where DNR's planning process is clearly explained and represented. The document does this repeatedly throughout its many, many pages and in doing so provides a much clearer understanding of the efforts undertaken by the DNR.

*Third, the City clearly supports the DNR adopting the Proposed FLP over the "no action" alternative. However, we are extremely concerned about the first decadal volumes indicated for the State Forest Lands, formerly referred to as Forest Board Transfer Lands.* We believe that the harvest volume numbers indicated on FLP Table A-19 are much lower than historic harvest volumes and appear to be even lower than the current sustainable harvest calculation's sold timber by the DNR OLY during the FY 2007-2014 period.

These points deserve to be highlighted and mentioned at the very outset of the comments provided. The comments, concerns, and/or issues noted below are not offered to detract or undermine the basis for the commendation and praise above. Rather, it is provided to articulate the City's position regarding these documents.

1. *Numerous Others Deserve to be Noted.*

The DNR notes its staff, past and present, who were instrumental in the development of this OESF plan over the past. In addition to those individuals, the City believes that there are non-DNR individuals either within the beneficiary and/or timber community, or individuals that the City obtained guidance and information from over the many years, that

also deserve to be recognized and/or remembered at this historic junction. These are provided in no particular order, but rather as they were remembered:

- John Calhoun
- Phil Kitchel
- Bob Dick
- Will Hamilton
- Ann Forest Burns
- Nedra Reed
- Phil Arbeiter
- Bryon Monohon
- Bert Paul
- Harry Bell
- Carol Johnson
- Jason Cross
- Jeff Comnick
- Bruce Bare
- Bruce Lippke
- Sen. Jim Hargrove
- Rep. Lynn Kessler (ret.)
- Diana Reaume
- Frank Walter
- John Jones
- Bruce Thomas
- Camille Scott
- Joshua Gilmore
- Brenda Hood
- Heath Heikkla
- Gordon Gibbs (DNR)
- Anastasia Fleck
- Rod Fleck
- Howard Thronson (DNR)
- Jack Hulse (DNR)

2. *Other Equally Important Efforts Necessitated the Completion of This Effort.*

The Department does correctly explain that the OESF FLP and its DEIS are required by the HCP adopted in 1997. While other documents are referenced as well within the DEIS and the FLP that required this effort, the information provided does not reflect that at times under previous administrations, the OESF FLP projected required significant involvement,

cajoling, at times litigating, and politicking to bring about this FLP. These unsung efforts were at times done by members of the beneficiary community, predominately the City of Forks, the Quillayute Valley School District, the Forks Community Hospital, as well as members of the timber community to include the North Olympic Action Council and the American Forest Resource Council. In addition, similar efforts were undertaken by various individuals and organizations within the environmental community. It is the City's position that had the diligence and persistence of these individuals and organizations not wavered in the past 17 years, the FLP and its DEIS may never have occurred.

3. What is the basis in the past seven years for a different amount, significantly more, of acres being classified as "long term deferred?"

Both the FLP (A-20) and the DEIS (2-6 for example) denote that 107,320 acres are deferred from management within the OESF. However, later in the FLP at Table A-16 the number of deferred acres is given as 110,832. In both cases, these numbers are substantially higher than the estimated 68,492 acres identified as being deferred for both short and long term periods in the OESF per the DNR's Managed Forest Lands in the Olympic Region – 2007 map produced by DNR's Land Management Division. While the definition of short and long term deferrals may have changed, or additional information may have been developed in the past six years, some further detailed information is necessary as the map at page 2-1 of the DEIS indicates that there are 110,832 acres of the OESF that is in long term deferrals and not the 67,235 acres identified in 2007. *The City would request that further detailed explanation be provided as an appendix as to the basis for these acres being deferred for the long term. Further the City believes that these identified deferred acres should be cataloged in such a way as to allow the DNR LMD or DNR OLY to assess whether the deferral is still valid and/or warranted.*

4. What Process is Used to Catalog and Periodically Reassess both Short and Long Term Deferrals? As noted immediately above, the City is extremely concerned about the manner in which lands are classified as being deferred from management/harvest and whether the basis for such a deferral is in fact periodically reviewed by both the Land Management Division and or OLY Division. *The City believes that a separate Appendix should be created that identifies the stand polygon that has been deferred; the reason(s) for the deferral; and the trust impacted by that deferral. Further, the FLP should have a specific policy objective that articulates the manner in which all of those cataloged lands so deferred would be reviewed to determine whether the deferral remains justifiable. Finally, the City believes that if there are those that expect the long-term deferrals would in fact extend in time beyond the current generation of beneficiaries. As such, a policy needs to be explored that brings a level of compensation to the present generation of trust beneficiaries associated with the deferral of those acres.*
5. Project State Forest Transfer Land volumes are low and deserve further assessment.

FLP Table A-19 provides a summary of the harvest volumes by landscape and trust, assuming that the DNR OLY region is optimally funded. For the State Forest Transfer Lands, a.k.a. as County Trust Lands or Forest Board Transfer Lands, the decadal volume is 133.2 mmbf, or 13.3 mmbf annually. This is less than the historic offering of the FY07-FY14 volume sold by DNR OLY estimated by the City from documents it has received over those specific years from DNR OLY to be approximately 16.44 mmbf. Further analysis is required as to why this 20% additional reduction occurs within the model over both the actual historical sold volume; as well as the sales offered volume target of 20mmbf. Little information is provided within the DEIS and/or FLP regarding the explanation for this significant impact associated with the preferred action. *The City would request that further information be provided to explain this significant impact and how it is reconciled with the DNR's Policy for Sustainable Forestry Local Economic Vitality policy.*

6. Could the Lower Project Timber Volumes be the Result of the Application of the Timber Volume Adjustment Factor?

FLP Table A-13 indicates that a potential timber volume adjustment factor was utilized to determine various stand's projected volumes. Is it possible that the adjustment factor may be lower than what has been historically realized in on the ground harvest activities? Further, this table does not appear to have a source/citation that provides the basis for this adjustment factor. *The City would request that further clarification on how these factors were applied in the development of the harvest volumes discussed in the City's comment number five above. Further, the City would ask for the citations to the literature that developed these volume adjustment factors.*

7. What Occurs with the OESF Arrearage for Current SHC?

While the current decadal (2004-2014) SHC for the OESF is set at 576mmbf, it appears from the information the City has available to it that this number has not been reached or obtained due to staffing levels and other legitimate challenges. While the FLP, and its DEIS, does not address this arrearage, a question exists as to what occurs if there are additional harvest activities associated with DNR meeting its statutory obligation with this unoffered volume. See RCW 79.10.330. The current DEIS denotes that impacts are determined by the number of forest stand entries taken within a landscape, however, if additional entries are required to meet future SHC statutory obligations with the sale of any existing arrearage, does that change the impacts noted on Table 3-15? *The City would recommend that some discussion of potential additional stand entries arising from addressing potential arrearage issues in the first decade of the FLP, which would be the next decadal SHC period, be included in the materials.*

8. Potential Harvest Levels in FLP Due in Fact Appear to be Constrained by only the SHC.

In reviewing the harvest volume information found within the FLP and DEIS, it appears that the outputs were in fact constrained by the SCH, even though that is noted as not being

the case, or something is not clearly explained. DEIS pg. 3-19 indicates that the volume outputs were not restrained by the SHC. However, in the FLP on page 80, the projected volumes found within FLP Table A-19 appear to be constrained by the SHC. This raises the question as to whether or not in the development of the projected harvest volumes by trust found within Table A-19 where any particular trust beneficiaries more impacted than others? *The City believes that further explanation is warranted to determine how the allocation was made on volume projections by trust within the confines of the SHC or a constrained projection in the FLP versus the unconstrained volume projection found within the DEIS at page 3-19.*

9. *FLP Incorporates an Optimization Approach – but remains silent on what occurs when stand/volume does not match the proposed sales within the model.*

In the FLP description of the steps associated with silvicultural management, there appears to be the reliance upon the model's optimization of proposed activities particularly in Step 2. However, little is explained as to what occurs if the field forester is unable to bring forward a stand for harvest in substantially the same volume and size as projected in the model. Is this unavailable volume simply left off of the offerings? Does the field forester attempt to reconfigure the proposed sale in such a manner as to meet both their environmental and volume requirements associated with the proposed action? Both the FLP and the DEIS are silent on this point – particularly at page 65 of the FLP. If the model is being recalibrated on a regular basis within the harvest decade, then this shortfall may be transitory in nature. However, if the model is not recalibrated until the half-way point or at the end of the SHC decade, a significant arrearage may be the result having immediate, and arguably harmful economic, impacts upon the beneficiaries relying on the volume and revenue associated with the proposed harvests. *The City would recommend that the FLP specific call out at what points in each decade associated with an adopted sustainable harvest that the model would be re-run/recalibrated as referenced within Step Seven of the FLP's seven part Timber Sale Implementation Process. FLP A-52, and 62.*

10. *Marbled Murrelet Strategy and Its Implications on OESF.*

The City understands that the Department is undertaking a long-term strategy for the marbled murrelet as required by the HCP. Currently, the Department is utilizing the existing interim marbled murrelet strategy with some minor modifications in the establishment of buffers around the polygons associated with potential murrelet habitat. The City understands that the interim strategy was developed to provide the greatest level of flexibility for future policies to address murrelet populations on DNR lands. *As a result, the City wants to state that the existing interim strategy regarding the need to aid in the stabilization of murrelet populations must be seen by the DNR as a regulatory ceiling in which the long term strategy would fall within; rather than being seen as a regulatory floor, or starting point, for additional regulatory actions resulting in further*

*deferrals of the existing manageable land base within the OESF.*

11. Clarification of the difference between the FRIS data and the Horton analysis on NSO Habitat within the OESF is needed.

*The City would ask that the information discussed on FLP A-41 regarding the Old Forest Habitat mapped by Horton et al. and that found within the NSO Habitat models be compared to determine if both are relatively close in their acreage estimates or widely disparate.*

12. City Supports DEIS Analysis associated with the application of an Exterior Riparian Buffer.

The DEIS analysis for the application of an exterior riparian buffer to address severe endemic windthrow appears to be properly applied and would only impact at most ~26 acres within the OESF. *The City supports such a rule and believes that establishing a higher implementing threshold above 5% would require additional analysis and literature support for anything higher.*

13. City Supports FLP Statement of Management Activities within the Interior-Core Buffer.

The HCP firmly established the concept of management activities within the riparian buffers of the OESF in such a way as to permit some entry activities that encouraged riparian function, or did not detract from the riparian conservation strategy. *The City supports such activities and believes that the DNR must ensure that the options available are in fact utilized when it would encourage riparian functions, or would not detract from the OESF riparian conservation strategy.*

Again, the City commends the Commissioner and his staff on their reaching a rather historic milestone within the life of the HCP and the OESF. In the Department's evaluation of these comments, and those submitted by others, if it is determined that additional work is required, or an additional alternative may be needed to be develop and analyzed to address the comments received, the City would be willing to work with the Department in such an effort. For our community, the OESF and its required Forest Land Plan have been the unrealized aspect of the Department's HCP. It remains the City's hope that the DNR will be able to have a FLP that is defensible and that can be implemented soon after adoption

Respectfully submitted,

William R. Fleck  
Attorney/Planner

# Individuals (no affiliation)

**Byrnes, Colman**

**Gallant, Connie**

**Hansen, Donald**

**Spring, William**

DNR SEPA Office

Dear DNR

I am writing to you to express my thoughts concerning the Revised Draft Environmental Impact Statement concerning the Olympic Experimental State Forest HCP Planning Unit Forest Land Plan. I would like to comment on the following points.

- 1) This is supposed to be an experimental forest. Is there any experiment in these plans? Or is it just an excuse to circumvent rules in order to maximize the cut? This plan is very short on monitoring and so can contribute nothing to adaptive management.
- 2) DNR, as a signatory party to the 1993 habitat conservation agreement, is obliged to have a recovery plan for Spotted Owls. Where is it? Current DNR timber sales are allowing good owl trees to be cut. These stands to often are not identified as owl habitat on timber sale documents. When owl habitat is delineated in these documents, these delineations to often include trees that make for substandard habitat. The draft EIS admits that owl habitat will be reduced over the next few decades but then increase afterwards. How will this affect the Spotted Owl's chances of long term survival? No one knows because DNR doesn't plan to do on the ground monitoring. There are numerous studies that have determined the environmental needs of Spotted Owls. DNR has ignored them. How will DNR know if their plan is working? They won't. There is no scientific justification for this plan and the lack of monitoring will only make the problem worse.
- 3) The Marbled Murrelet is listed under the Endangered Species act. This is no secret. DNR knows this. It is outrageous that DNR doesn't have a Marbled Murrelet recovery plan in place. It is also outrageous that DNR refuses to set a deadline for such a plan. How can this plan be implemented without a murrelet recovery plan?
- 4) The riparian section has a lot of impressive graphs and equations. But when one looks beyond the smoke and mirror, one sees an attempt to decrease riparian protection. LEAVE THE RIPARIAN VEGETATION ALONE. It is too important. It is important not only for fish and aquatic organisms but for most other forest ecosystem vertebrates as well. It is ridiculous to think that someone

sitting in front of a computer at a desk in Olympia can make valid decisions concerning riparian management. Stream tying and riparian delineation needs to be ground truthed and the personnel that perform this task have to be trained to do the job properly. In other words on the ground monitoring is needed. Too many people out of the Forks office mistype streams. In addition to biological function, the riparian vegetation has an important role to play in managing the hydrological regime of the watershed that they are a part of. Stay out of the riparian vegetation.

Thank you for considering my comments.  
Coleman Byrnes

**December 16, 2013**

**Reference:** SEPA File No. 10-060101

**SUBJECT:** REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT ON THE OLYMPIC EXPERIMENTAL STATE FOREST (OESF) HCP PLANNING UNIT FOREST LAND PLAN

I have been very concerned with DNR's proposals to continue logging in habitat sensitive areas, particularly Marbled Murrelet habitat. In a single decade (1996-2006), roughly 243,500 acres (30%) of higher suitability nesting habitat was lost on non-federal lands in Washington State (including the OESF), and 94% of this loss was due to timber harvest (Raphael et al. 2011).

It is critical and imperative that the OESF Memo and FLP be amended to fully reflect the Long Term Conservation Strategy ("LTCS") Science Report for Marbled Murrelet to make a significant contribution to maintaining and protecting the population – or, at a minimum:

- Require 328 foot (100 meter) buffers around all occupied sites and old forest,
- Require timing restrictions from adjacent management activities in a 0.25 mile radius around all occupied sites during the breeding season (1 April – 15 September),
- Designate MMAs as defined by the Science Team and begin to restore habitat within them – and,
- Provide opportunities adjacent to MMAs to mitigate for harvest in MMAs since the completion of the Science Report.

Public agencies tasked with guarding our natural resources must take into consideration the environmental changes that our entire planet is going through. Not to pay attention to such changes is myopic, costly, and will only lead to more devastation of our natural resources and wildlife habitat.

Respectfully submitted,

Connie Gallant

Donald Hansen

What are the results?

I have been out in the timber and reprod, I know it is growing very well. I believe we could be harvesting more. How is the wildlife doing? Can the results be quantified?

Dear Department of Natural Resources Comment Analyst,

As a concerned citizen, I wish to make the following comments and recommendations on the revised draft environmental impact statement for the management of Olympic Experimental State Forest:

1) I am particularly alarmed by DNR's proposed elimination of virtually all external riparian buffers on all stream types as required by the 1997 HCP. The projected retention of such buffers on 1% of streams is not even a token presence, and constitutes an affront to the objectives and philosophy of the OESF. This proposal, if implemented would assure rapid degradation of riparian habitat and water quality, thus further degrading salmonid survival in OESF rivers and streams and compromising habitat restoration values at the core of the OESF mission. Extreme winter rainfall events combined with periodic extreme wind events associated with Pacific storms make the presence of these exterior buffers critically important to both restrict episodic sediment loads from reaching streams and rivers and to prevent windthrow damage to the interior riparian buffers. All buffers must be fully retained in undisturbed condition, consistent with 1997 HCP riparian zone specifications.

2) The RDEIS prediction of 50 years in order to attain RESTORATION THRESHOLD for fish habitat in the stream and riverine habitats for anadromous fish is unacceptably excessive, and could be expedited by full and immediate implementation of the 1997 HCP prescriptions for full, undiminished interior and exterior riparian zones. Species facing extinction cannot wait many decades before meaningful improvement in their habitat is achieved through slow increments in DNR forest practices. Reducing these zones as proposed by DNR is unconscionable, in view of the perilous states of most salmonid native stocks on the Peninsula. The proposed revisions should be rejected as contrary to the objectives of the OESF vis-à-vis forest health and fish survival and viability.

3) Protections for marbled murrelet habitat are barely referred to in the RDEIS, and this constitutes a serious omission. The draft must be further revised to fully incorporate the Science Team report's recommendations for all LPUs in the OESF. This should include mandatory retention of all areas of murrelet habitat now in deferred status, as well as habitat buffering and disturbance avoidance. These vitally important measures must not be optional, as proposed by DNR. Further management strategies should be incorporated by the OESF plan without delay, to include: a. immediate designation of marbled murrelet management areas, combined with habitat restoration within them, b. use of timing restrictions around all occupied and probable nesting sites, c. mandatory, inviolable 100 meter buffers around ALL murrelet nesting sites.

Thank you for the opportunity to offer comments and recommendations on the RDEIS for Olympic Experimental State Forest.

Respectfully Submitted,

William Spring

**Interfor**

**Comments Received**



December 16, 2013

Washington State Department of Natural Resources SEPA Center  
PO Box 47015  
Olympia, WA 98504-7015

VIA EMAIL: [sepacenter@dnr.wa.gov](mailto:sepacenter@dnr.wa.gov)

Re: Comments on Olympic Experimental State Forest HCP Planning Unit Forest Land Plan Revised Draft Environmental Impact Statement

To whom it may concern:

Thank you for this opportunity to submit comments on the Revised Draft Environmental Impact Statement (RDEIS) for the Olympic Experimental State Forest Land Plan (Plan).

These comments are on behalf of Interfor US, Inc. Interfor is committed to responsible stewardship of the environment. We support good stewardship of all forest resources in a sustainable manner that is environmentally appropriate, socially beneficial and economically viable. And we promote the use of our wood products as a good choice for the environment.

Our Peninsula Operations provide 225 direct and approximately 300 indirect family-wage jobs. The DNR provides a substantial portion of the supply necessary to sustain these jobs. We hope the DNR will utilize the following comments to ensure the Olympic Region offers the volume calculated as the current sustained yield.

Interfor greatly appreciates the time and effort DNR staff has put into this RDEIS. We recognize the importance of the work and look forward to the final product and its successful implementation. We also appreciate the staff's time in meeting with us and other industry representatives to explain what's in the RDEIS and answer our questions.

In an effort to save you time in doing the content analysis, we hereby incorporate by reference those comments submitted by the American Forest Resource Council (AFRC).

There are a few matters however we wish to highlight herein. These are:

1. The range of alternatives.
2. The 26,239 acres identified on pages 70 and 71 of the Appendix A Draft OESF Forest Plan that are labeled "Operable acres with no modeled harvest scheduled".
3. The forest inventory data used to prepare the RDEIS and draft plan.
4. How will the model work in conjunction with on-the-ground knowledge?
5. Mitigation of potential high impacts related to the road network.

## Range of Alternatives

Interfor is concerned about the fact the RDEIS only analyzes and displays the effect of the No Action and the Proposed Action alternatives. This is a concern for two reasons: the two alternatives' effects appear essentially the same and we fear not having a reasonable range of alternatives may not be legally defensible.

At a minimum the DNR should include one or more alternatives that look at managing unstable slopes. Given current policy and the experimental nature of the OSEF surely the DNR can examine ways to manage these areas at an appropriate intensity such that they both contribute to wildlife habitat conservation and commercial forestry. With today's science and technologies this is not beyond the realm of possibilities.

In addition the approximately 62,000 acres of deferred acres that are not old forest or habitat and that won't contribute to the 20-40 goal should also be included in an alternative as operable acres.

Last, the 26,239 acres of operable lands not scheduled for harvest need to be modeled such that they are scheduled. If these acres have negative present net values then the model would show these effects accordingly.

## Operable acres not scheduled for harvest

When we met with DNR staff on December 3 we asked what and where these acres are and why they were not scheduled. Regrettably the answer we got was not satisfactory. These acres represent 10% of the OSEF and the reason for them not being scheduled should be determined and explained in the RDEIS and Plan.

Clearly there must be some limiting factor: budget constraints, net present value, or something. Yet the staff in the meeting simply said they did not know and they were investigating.

This is unacceptable and before any final product is produced the answer to this question must be provided. In addition an alternative must look at scheduling these acres (they can be forced in the model) to determine the contributions or impacts these acres have.

## Forest inventory

The forest inventory is critical to many attributes of the RDEIS and Plan. These include but are not limited to the modeling and environmental analysis.

The success of the forest estate model depends upon accurate forest inventory data. In addition, the determination of northern spotted owl habitat was based on age but has been changed such that's it now determined by the forest inventory. Though we support this change we also want to be comfortable with the forest inventory.

It's not clear when the forest inventory was last updated nor what the Department's plan is going forward on how often the inventory will be updated and at what intensity.

## Uncertainty of modeling

Chapter 4 talks about the some of the uncertainties involved with the RDEIS and Plan. One of these is the use of a forest estate model.

“The forest estate model is a sophisticated, computer-based mathematical representation of the forest. The model is based on the best available science about how forest stands grow and change in response to a series of management activities (including harvest) and natural forest growth processes.”

RDEIS page 4-10.

As you point out the model is only as good as the data that drives it. As discussed above we have some concerns about the forest inventory which clearly is one of the most important components of the model.

The forest estate model provides DNR land managers a powerful tool to plan timber sales on a landscape scale. Yet as the RDEIS rightfully points out the model is only a “mathematical representation” of what might happen on the ground.

How will the DNR balance the use of the model as a planning tool with foresters’ local knowledge and on the ground experience? In instances where inventory data is not a true reflection of on the ground stand conditions will the foresters have the ability to make forest management decisions? We are concerned the model will restrict the timber sale planning process and take away land managers abilities to use their local knowledge and experience.

## Mitigation of potential high impacts related to the road network

The executive summary says:

“All potential high impacts related to the road network are expected to be mitigated to a level of non-significance through current management practices, which include implementing road maintenance and abandonment plans; inspecting, maintaining, and repairing roads; and suspending timber hauling during storm events.”

Executive Summary page ES-19.

We strongly urge the DNR to utilize the first two of these mitigation measures to the greatest extend practical. Proper maintenance and repair would be the preferred mitigation measures and directly address the causal factors contributing to these potential high impacts.

The alternative mitigation of suspending haul during storm events poses immediate problems from an operational perspective and would be more expensive overall to the trusts. If the maintenance and repair mitigation measures are properly done, there should be no reason so suspend haul.

In closing, we appreciate the opportunity to submit these comments. We would also welcome the opportunity to discuss these or any other matters more thoroughly if DNR staff would like to do so. Please feel free to call me at 360-477-6487.

Sincerely,

Steve Courtney  
Timber Procurement Manager PNW Operations, Interfor US, Inc.

# Mendoza Environmental

**Comments Received**

# **Mendoza Environmental, LLC.**

## **Aquatic Resources and Conservation Consultants**

**Christopher C. Mendoza**  
Principal / Conservation Biologist

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7 December 2013

To: DNR State Lands SEPA Center, Marcy J. Golde, The Olympic Forest Coalition

From: Christopher Mendoza

Subject: Review of Forest Estate Model in the Revised Draft Environmental Impact Statement (RDEIS) for the Olympic Experimental State Forest (OESF) 2013.

On behalf of the Olympic Forest Coalition:

Below is summary of my findings concerning the Forest Estate Model based on Review of the RDEIS (including Appendix D: Modeling, and Appendix I) for the Olympic Experimental State Forest. These findings also reflect meetings with DNR (Angus Brodie and FEM modeling staff) on December 4 and 12, 2013. I'd like to thank DNR for taking the time and allowing me the opportunity to meet with modeling staff, namely Weikko Jaross, who was very helpful in answering questions concerning the inter-workings of the Forest Estate Model.

### **Report Objectives**

After meeting with OFCO representatives following DNR staff presentations on revisions to projected spotted owl habitat (October 4, 2013), I was retained by OFCO to investigate changes to modeled projections of "*potential NSO territories*" based on the use of the Forest Estate Model (FEM). More specifically, I was directed to further investigate "*input variables*" driving FEM outputs, how those variables were derived, and any resulting changes to prior (pre-model) spotted owl habitat.

Additionally, I was asked to summarize the implications of short and long-term harvest planning strategies based on the extent of federal assurances (50 years) granted under the State Lands HCP (2007). To this end, I will explore how harvest "*constraints*" (defined in Appendix D) built into the FEM potentially impacts short and long-term harvest planning.

Lastly, I've submitted recommendations for validating and monitoring the FEM based on model assumptions that will help guard against error in projecting potential spotted owl habitat and territories so they are realized on the ground.

## **Background**

In June 2011, the USFWS released the *Recovery Plan for the Northern Spotted Owl*. The plan recommends the development of spatially explicit computer models to evaluate northern spotted owl "*territories*" (RDEIS 3-203). The indicators used to assess the amount of habitat capable of providing support for the recovery of the Olympic Peninsula sub-population of northern spotted owls (a.k.a. "*criterion*") are the number of acres of modeled habitat, the number of acres supporting northern spotted owl (NSO) life history requirements (*movement, nesting, roosting, and foraging*), and the number of modeled potential NSO territories (RDEIS 3-204).

### Number of Acres Supporting NSO Life History Requirements

DNR developed four NSO stand-level models to assess the ability of state trust lands in the OESF to support these four life history requirements. Forest stands are given a habitat score for each life history requirement based on specific forest attributes (for example: downed wood and snags). Scores range from 0 (least) to 100 (best) with the minimum habitat score for supporting a life history requirement assumed to be 50. For this indicator, DNR determines the number of forested acres on state trust lands in the OESF projected to have a habitat score of 50 and above for each life history requirement (Appendix I).

### Number of Modeled, Potential NSO Territories

DNR evaluated how many modeled, potential NSO territories the OESF could support over time under each alternative (a territory is an area that an owl occupies and defends). DNR's territory model uses habitat scores to identify areas in the OESF with the potential to support a NSO territory at a landscape level. These territories are "hypothetical" and they are not actual territories. Northern spotted owls may or may not be found in these areas now or in the future (RDEIS 3-207).

In an attempt to incorporate the uncertainty surrounding how owls use the landscape, DNR runs a territory model 500 times per alternative (Monte-Carlo Simulation) whereby one repeatedly runs a simulation and randomly varies one or more parameters. Each model run (iteration) predicts the number of potential NSO territories that the OESF could potentially support at a particular point in time (Decade 0 – today, to Decade 9). All of the 500 model predictions are graphed as a distribution of scores (Figure 3-24, RDEIS) showing that some predictions are more likely to occur than others.

### DNR's Reported Potential Environmental Impacts

The two categories of NSO habitat types used in the RDEIS are “Old Forests” and “Young Forests” (Text Box 3-8, 3-205 and Appendix I) based on the habitat definitions in state lands 1997 Habitat Conservation Plan. The amount of Old and Young forest habitat on state trust lands for each of the 11 landscapes in the OESF provide different levels of support for northern spotted owls. In each landscape DNR considers: 1) the number of acres of modeled Old Forest Habitat (OFH), and 2) The number of acres of Young Forest Habitat (YFH) and better (acres of YFH and OFH added together). DNR combines these two habitat types to understand the full range of modeled northern spotted owl habitat in each landscape. DNR refers to habitat as “modeled” to emphasize that the current conditions and results of their analysis are based on the outputs of the Forest Estate Model.

DNR then assigns each landscape a potential “*low, medium, or high impact rating*” based on whether the amount of modeled Old Forest Habitat and Young Forest Habitat and better on state trust lands is projected to “*increase (low), stay the same (medium), or decrease (high)*”, respectively, by the end of the 100-year analysis period for the No Action Alternative and the Landscape Alternative (Table 3-58, 3-59, RDEIS page 3-212, 213).

Finally, DNR determines that the potential environmental impact of either alternative (no action and landscape) for this indicator is considered “*low*”. That is, the number of acres in modeled Old Forest Habitat and Young Forest Habitat and better in each landscape is projected to increase by the end of the analysis period (100 years). Considering all landscapes together, the trend over time is an increase in modeled Old Forest Habitat and Young Forest Habitat (Chart 3-8, 3-81, RDEIS page 3-214) and therefore, “*DNR has not identified probable significant adverse environmental impacts from either alternative from this indicator*”.

DNR goes through a similar environmental impact assessment for other indicators including the 1) number of acres supporting NSO life history requirements and 2) the number of modeled, potential NSO territories. In both cases, again based on the modeled outcomes, DNR determines that potential environmental impact of either alternative for these indicators is “*low*” and therefore, has not identified probable significant adverse environmental impacts from either alternative (Chart 3-84, 85, pages 3-218, 219).

### **The Forest Estate Model (FEM)**

DNR utilized a computer model – the Forest Estate Model – to develop their forestland plan for the OESF. The FEM is intended to assist DNR in determining when and where timber harvest can occur while meeting other DNR objectives, and includes quantitative analysis techniques that evaluate “outputs” from the FEM to “determine if there are potential environmental impacts associated with the alternative” (RDIES Chapter 3, Appendix d). DNR used the “Remsoft Spatial Planning System”, a commercially available forest estate modeling software package developed by “Remsoft Inc.” in development of the OESF Plan.

In order to understand how model “outputs” are derived, differences between the OESF No Action and Landscape Forest Plan, and how those outputs and differences were arrived at using the FEM model, one must delve into some model fundamentals. This by no means attempts to details all input variables. I will mostly focus on the data supporting the growth and yield tables, which in turn are used to project forest stand conditions (spatial and temporal) like species composition and stand structure (e.g., size/age/distribution of standing trees, snags, downed wood, canopy condition).

Briefly, the FEM is a simplified representation of the “real world”. It attempts to capture the most important features of a decision being considered – in this case how to manage a forest – by relying on mathematical formulas to represent various factors that influence management decisions. In modeling terminology, “*criterion*” are developed which the FEM seeks to “maximize” or “minimize” and is referred to as the “*objective function*”. The objective function for the No Action and Landscape Alternatives is to “maximize the financial return to the trust beneficiaries, as represented by *net present value*”. The objective function is subject to a set of “*constraints*” which describe the requirements to which model decisions must adhere. These constraints may reflect “ecological, financial, operational, or policy considerations” (RDEIS, Appendix d).

The FEM requires several data input sources including; 1) Land classifications, 2) Stand-level projections of future forest conditions (known as yield tables), 3) Objective function, 4) Constraints, and 5) Descriptions of management activities (known as “actions and transitions”).

The FEM uses land classification that describe a give location on the ground (e.g., Type 3 watershed, rain dominated, forest inventory unit, distance from stream, etc.) These classifications are derived from a suite of spatial and tabular Geographic Information Systems (GIS) data, which are combined together to form DNR’s “large Data Overlay”. A subset of attributes from the Large Data Overlay is then represented in tabular form inside the FEM using attributes called “themes” described in Table D-1 (RDEIS, appendix d).

### Theme 1 (TH1) Forest Inventory Units (FIU)

DNR has an extensive forest inventory with 46,033 plots distributed across OESF forestlands (DNR staff Weikko Jaross, personal communication, Map 1). The inventory is divided into separate units representing areas with relatively contiguous homogenous forest conditions known as stands. The inventory contains detailed data on forest stand characteristics including; tree species composition, average tree diameter, height, volume, basal area, and tree density. This inventory consists of “actual field-measured data” at a density of approximately one plot per five acres (RDEIS, appendix d, Table D-1). Each FIU is given a unique numerical identifier and the sampled data (original field collected measurements) are used by

the FEM. Since the field-collected measurements describe the conditions that were present at the time of sampling (after 1990), they are “grown” to the current date (this year) using the “*Pacific Northwest Coast variant of the USDA Forest Service Vegetation Simulator (FVS-PN)*.”

### Theme 2 (TH2) Silvicultural Regime

Silvicultural Regime describes the timing and type of harvest currently assigned to a given area. A multitude of regimes are possible with some stands managed as a series of commercial thinning; some as “final regeneration” harvest (clearcut); and some receiving no management. The selection of an “appropriate” regime for a given area is a primary function of the FEM. The “decision” is based on site-specific conditions, as well as “considerations” that take place at larger scales, such as those at the watershed or landscape level. One regime was modeled to include no harvest at all.

Ten thinning regimes were modeled with each comprised on commercial thinnings at 30-year intervals. The ten thinning regimes differed only in the decade in which the first thinning is conducted. Forest thinnings were modeled by following the recommendations of Holmberg and Aulds (2007) and Carey (2003, 2007).

### Theme 3 (TH3) Management Deferral Status

Management Deferral Status describes the level of harvest activities permitted within a given area. These deferral designations were assigned in accordance with the 2006 Policy for Sustainable Forests, the 1997 Habitat Conservation Plan, and the 2006 Settlement Agreement (RDEIS, Appendix d, Table D-1). Deferrals may be short-term (one or more decades) or long-term (all 10 decades of the model simulation), or they may restrict some harvest but not others (thinning might be allowed, but not regeneration harvest).

### Theme 4 (TH4) Forest Management Units (FMUs)

Forest Management Units (FMUs) are areas of contiguous forest designated for management activities. Silvicultural activities are tailored to site-specific conditions within each FMU. Forest Management Units average approximately 65 acres in size and may consist of all or part of a Forest Inventory Unit (FIU), or may contain multiple parts of inventory units.

### Theme 5 (TH5) Watershed and Riparian Assessment Area

A Watershed and Riparian Assessment Area consists of a combination of 3 values: the Type 3 watershed identifier, the hydrologic zone - a classification of each area according to its dominant precipitation type, either rain dominated (RD) or rain-on-snow dominated (RS) - and the riparian assessment area (a classification of each location based on its distance from the stream channel). The riparian assessment

area is patterned after the expected average width interior-core and exterior buffers as described in the 1997 Habitat Conservation Plan. These areas vary in width based on stream type. They are not meant as buffer recommendations. Instead, they are used to designate areas in which riparian function is assessed. In the Forest Estate Model, these areas are represented by the a variety of designations including unstable slopes, channel migration zones, wetlands, and “expected” average widths of interior core buffers for Type 1 through 4 waters (RDEIS, appendix D, Figure D-1).

Collectively, the five themes (above) serve to describe any given location in the OESF. The combination of values taken on by the five themes, with the addition of an age index, is known as a *development type*. A development type is the basic unit upon which “actions” (e.g., harvest) are conducted and “predictions about the outcome of those actions are made in the forest estate model”. For the OESF forest estate model, the age index is measured in decades (RDEIS, appendix d, Table D-2).

All stands with a unique combination of attributes (i.e. development type) are expected to grow and respond to silvicultural activities in the same manner. Approximately 462,000 development types were used in the Forest Estate Model, one for each unique combination of values for themes 1 through 5 with the addition of age index.

Additionally, land classifications were derived using grouping (aka “aggregations”) of various themes. Aggregations are derived on a theme-by-theme basis and may be constructed from any of the five themes, but each aggregation may only include values from a single theme. For example: the collection of all areas in which thinning is permitted was represented by an aggregate of THEME 3 values “NA” (not subject to deferral) and “PARTIAL” (harvest). The boundaries of each of the 11 Landscape Planning Units in the OESF were represented using aggregations of Forest Management Units (THEME 4, appendix D, Table D-2).

Based on the above inputs the FEM calculates where, when and how much harvest may occur for a given age class and stand type within Forest Management Units. This calculation is made with other model “constraints” not detailed in this summary. However, it’s worth noting that the one main constraint related to economics – DNR’s sustainable harvest calculation - was “released” from the initial modeling effort in an attempt to see if the FEM would provide outputs “close” to what DNR’s expected harvest calculations under their Sustainable Harvest Plan (DNR staff, Weikko J. personal communication).

## **Examples of other Growth and Yield Models**

### Desired Future Conditions (DFC) Model

The Washington Forest Practices HCP for private forestlands uses a growth and yield model known as the Desired Future Conditions (DFC) model maintained by DNR’s Forest Practices Division. This particular model is based on ORGONON with

minor modifications to account for limited tree mortality. Immediately following adoption of the FP Emergency Rules in 1999 (Forest and Fish Report, DNR 1999). The Forest Practice Board prioritized funding the “Desired Future Conditions Target Validation Project” (Shuett-Hames et al. 2005) in order to validate assumptions (e.g. basal area/acre targets) carried over into the DFC model directly affecting Forest Practices Rules in riparian zones for fish-bearing waters. CMER determined that:

*“Validation is necessary because of the problems with the process used to develop the basal area values.... The process had several weaknesses. First, The exact location of FIA and USFS plots is not known. The plots were located within 70m of the stream, but were not necessarily adjacent to the stream, so some of the data may not reflect riparian stand conditions. Second, stand age was estimated for many plots. Third, data from stands between 80 and 200 years of age was used to estimate the value for 140 year-old stands, based on a weak regression (R sq. of 0.19). Fourth since site class was not available for many plots, the regression with upland stand data for which site class was known was used to estimate site class.” (RSAG 2000).*

Results of the DFC Model Validation Project (2005) revealed that basal area/ acre targets in rule for Type F (fish-bearing) waters were significantly lower than what was actually found to be true in the field. In response to CMER’s findings, the Forest Practices Board increased the basal area/ acre targets to 325 for all Site Classes (I, II, III, IV, V) with results that were found to be statistically significant (WA Forest Practices Board 2006).

The initial data underlying the basal area/ acre (BAPA) targets in rule were taken from USFS Forest Inventory and Analysis (FIA) plots located throughout western Oregon and Washington. The vast majority of the plot data was taken from upland forest stands outside the regulatory riparian management zone (DFC Model Validation Study, 2005). When BAPA were initially established under the Forest and Fish Report and later adopted by the Washington State Legislature, assumptions were made that did not differentiate forest conditions (e.g., tree species composition, age, diameter) in upland stands from those in riparian stands located adjacent to Type F waters (DNR Type 1, 2, and 3). Additional assumptions were also made regarding FIA plot data concerning unknowns about pre inventory management history potentially affecting current forest stand conditions (e.g., species composition, age, diameter, density). Following completion of the DFC Validation Study (Shuett-Hames et al. 2005) CMER concluded that the significant differences between the BAPA values in the current Washington forest practices rules and the DFC Validation Study were attributed to several main factors cited in the DFC Validation Study (2005):

1. The FIA, USFS, and industry data were taken from plots that were predominantly located in upland areas well outside of riparian zones (CMER-RSAG 2000, Fairweather 2001, Shuett-Hames et al. 2005) and therefore, non-representative of actual riparian reference conditions.

2. These plots have forest management histories that are essentially unknown and therefore, may have already been partially or selectively harvested at various levels of frequency and magnitude.
3. Due to the history of widespread thinning and selective harvest observed on private, state, and federal forestland, it is likely that some trees have been removed from many FIA plots in the past.

The DFC Target Validation Project essentially proved this assumption to be false, which in turn led Forest Practices Board to increase basal area/ acre targets for all Site Classes. Not doing so would have left salmon and trout bearing streams with riparian buffers narrower than the HCP anticipated for the conservation of covered species.

The DFC Validation Project also revealed differences (statistically significant) between growth rates for Douglas fir and western hemlock located in riparian forests between 120 – 160 years old (Shuett-Hames et al. 2005). These differences have yet to be used calibrate the DFC Model, although, DNR Forest Practices has committed to doing so at some point in the future (FP Board meeting, 2006).

#### Proposed Family Forest Lewis County HCP (not approved by NOAA or USFWS)

The proposed Family Forest HCP (2008) ran into similar problems, for similar reasons, concerning the use of FIA data to establish forest practices rules and targets, in addition to modeling large woody debris recruitment, for managing and maintaining forest stand conditions in riparian areas (See comments to FFHCP, Mendoza 2008). Consequently, the federal services denied approval of their HCP.

### **Discussion and Recommendations**

DNR's growth and yield model (FVS – PN) used in the RDIES has several advantages over prior attempts (above) at modeling current forest stand conditions at a landscape level, and projecting future conditions, but like other growth and yield models also has limitations.

The greatest **advantage** being that DNR's data used to calibrate their Forest Estate Model is taken from over 46,033 forest inventory plots (aka forest inventory units) located on forest lands within the Olympic Experimental State Forest (RDEIS, Appendix D, DNR staff Weikko J. personal communication). Unlike the above examples where FIA data were taken from locations outside the area being managed (WA, OR, CA), DNR has 46,033 FIU within the OESF and therefore, FEM analyses for the OESF should better reflect current growing conditions at the local and landscape level based on the distribution and number of FIUs in the OESF (attached map, DNR December 13, 2013).

A key **limitation** is the time past since the information taken from the FIUs on OESF lands, and the amount of time projected forward (e.g. 50-100 years). The FIU field

data taken within the past five years will better reflect growing conditions than FIU data taken in 1995. To that end, DNR could take a subsample of older FIU plots located within the OESF to validate stand conditions projected by the Forest Estate Model to validate assumptions about growth and yield. Projecting stand conditions farther into the future has limitations based on the relatively short amount of time growth and yield models have been developed and utilized relative to the age of forest one is trying manage. That is, modeling tree growth over a short harvest rotation (e.g. 35 years) will closer reflect “reality” that modeling tree growth and stand characteristics over 100 years by virtue of the fact that humans have not be tracking changes in forest stand composition and structure for that long.

The FEM projects forest stand conditions for the Landscape Alternative that could potentially become northern spotted owl territories by supporting specific life history requirements (movement, foraging, roosting and nesting) over 100 years. The estimated acres of potential NSO habitat under the Landscape Plan (RDEIS , Table 3-56) is different from acreages previously reported by DNR due to assumptions built into the FEM. Example: For the Landscape plan DNR projected changes to more habitat attributes including “snags” and “downed wood” that have occurred since FIU data was collected. When the 1997 Habitat Conservation Plan was written, DNR used the “best available data”, which was stand age. Since stand age only describes the age of the stand, not it’s structure, DNR made assumptions that stands of a certain age would provide NSO habitat. This method was “found to overestimate the amount of habitat present” (RDEIS, Section Notes, 3-221, 222). The FEM was calibrated to use forest stand structure (snags, tree diameter, and tree height based on forest inventory data) to estimate the amount of NSO habitat present. This methodology “lowered DNR’s overall estimate of the amount of habitat present in the OESF” (RDEIS, Section Notes, 3-222).

The introduction of snags and downed wood as a variable driving FEM outputs on potential NSO territories brings with it assumptions about how stand composition and structure will change over time. Since prior estimates of NSO habitat did not account for such stand attributes, that meet habitat requirements, DNR’s new estimates based on the FEM reflect changes to the amount and location (landscape) of potential NSO territories that may develop over the next 100 years (REDIS, 3-212, 213). Developing a Monitoring Plan to help validate model assumption over the life of the HCP would decrease model error, and therefore risk to listed species.

The acquisition and use of LiDAR (Light Distance and Ranging) with complete coverage of the OESF would also help validate FEM assumptions regarding current canopy conditions, particular for northern spotted owls and marbled murrelet habitat. Based on additional “post process” changes made to the FEM regarding model estimates of older trees located along “edges” created from harvest, potential marbled murrelet nesting platforms substantially increase over time (RDIES, Appendix D, Chart D-2). This is based on the assumption that large edge trees will have the benefit of more light and growing space and therefore, will experience accelerated growth when management activities (harvest) are conducted. This type

of “post-process” modeled response equated to a greater potential for and increased number of nesting platform.

At a recent science conference on remote sensing techniques held by CMER (November 19, 2013), USFS and USGS staff presented advancements in LiDAR quality and data collection techniques in forest habitat assessments, and the implications for forest management. Of particular note was a presentation given by Joan Hagar (USGS) on wildlife habitat modeling for marbled murrelets and NSOs. Briefly, her presentation described in detail the ability of LiDAR to accurately detect and depict canopy structure in older forests beyond the capability presently provided by methods conducted from the ground. According to J. Hagar, if the LiDAR “point cloud” is dense enough, canopy structure can be detailed in a way not “humanly possible” using today’s standard methods.

### **Specific Recommendations**

Validate FEM assumptions regarding current stand conditions by visiting a subsample of Forest Inventory Units that were collected a long time ago (during initial Stand Inventory) and compare with FEM growth and yield projections.

Acquisition and coverage of LiDAR to validate FEM current stand conditions, and the location and amount of spotted owl and marbled murrelet habitat in the OESF.

The development of a long-term monitoring plan designed to conduct routine sampling (5-10 years) of FIUs within short-term Harvest Management Units to validate FEM model projections. Developing specific monitoring projects that documents and follows “pathways” to older forest stand conditions via routine sampling methods (e.g., LiDAR combined with field sampling) decreasing the risk of model error, particularly for long-term model projections of old forest habitat.

Have DNR’s version of the FEM independently reviewed by the University of Washington School of Forest Resources modeling experts. Including the “post process” additions that were not part of the FVS – PN (e.g., in-growth stocking levels, MM nesting platforms resulting from “edges”, etc.).

### **Habitat Conservation Plan Modeling Requirements within 50 years.**

The RDEIS is premised on the FEM projecting potential forest stand conditions that meet their HCP’s conditions (riparian and upland) as a prerequisite to analyzing environmental impacts over the next 9 decades (100 years). What is unclear is the timeline under which the DNR’s incidental take permit is granted (50 years) and whether, and if so how, that factors into DNR’s analysis of potential environmental impacts, most all of which have been determined by DNR as “low”. Consequently, DNR has “not identified probable significant adverse environmental impacts from either alternative”.

For example, in projecting the number of acres supporting Northern Spotted Owl Life History Requirements Chart 3-82 shows the number of acres of NSO habitat in the OESF with Habitat scores of 50 or above (RDIES, Chart 3-82, Page 3-215). The amount of projected habitat acres is for the No Action and Landscape alternatives and moves from current conditions forward in time through decades 1 – 9. The following Chart (3-83, page 3-216, 217) breaks this down by Habitat type: A) Movement, B) Foraging, C) Roosting, and D) Nesting.

If one of the HCP's goals is to meet these projected NSO Habitat Acres by year 50, that will have very different implications for harvest planning (Silvicultural Regime) than if the goal is to meet a similar level of habitat acres by year 90. For example, Chart 3-83 indicates that projected acres of NSO habitat for Movement remain relatively constant from year 50- 90, with Foraging increasing slightly, and Roosting increasing more so, before dropping over the same time frame.

However, total acres of D) Nesting Habitat increases substantially between years 50 – 90 indicating a potential “bottleneck” to species viability and reproduction as increases in the other three Habitat types become irrelevant if Nesting Habitat is limited to the extent that the species is no longer viable. DNR speculates, “*The slow increase in the number of acres for nesting may be due to the time it takes forests to develop elements of structural complexity such as large snags and downed wood*” (RDIES, page 3-215).

I cannot render an opinion on what the Services require under DNR's Landscape Plan for the OESF, that question is best left for NOAA and the USFWS. However, the implications for short- and long-term harvest planning under DNR's Silvicultural Regime are substantial if for example, the projected acres of NSO Nesting Habitat from Chart 3-83 in decade 9 are instead required to be met in decade 5 (the life of the HCP). That would directly affect (reduce) the amount and type of Forest Management Units that could be harvested if the Nesting acreage “target” essentially got moved up 40 years from decade 9 to decade 5. Conversely, if the Nesting acreage target got moved out to say 150 years, that would affect (increase) harvest rates of potential habitat and older forest stands as forest managers would have more time to meet that target.

Since HCP's often “mitigate” for impacts from harvest throughout the life of the HCP, permit holders often “front end load” their short-term harvest unit planning knowing that down the road (over time) greater restrictions to harvest may apply depending on which impacts they are attempting to mitigate. In the case of the RDIES for the OESF, the question for the Services would be what exactly those targets are (Example: projected acres of NSO nesting habitat), and when they have to be attained (end of the life of the HCP, 50, 100, years?). The current condition (population viability) of the species in question should also be taken into consideration, and how changes in population dynamics could impact short- and long-term forest management planning.

Thanks for your time and consideration.

## REFERENCES

- Fairweather S.E. 2001. Westside RMZs and the DFC Model: Documentation of their conceptual and methodological development. Prepared for the Riparian Scientific Advisory Group (RSAG) and the Cooperative Monitoring, Evaluation and Research committee (CMER), TFW-RSAG- 1-01-001, Olympia, WA.
- Riparian Scientific Advisory Group. 2000. Draft: Proposed study plan to validate the riparian DFC performance targets for Westside Forests and Fish riparian prescriptions. Cooperative Monitoring Evaluation and Research (CMER) Committee, Lacey, Washington.
- Shuett-Hames, D., R Conrad and A. Roorbach. 2005. Validation of the Western Washington riparian Desired Future Conditions (DFC) performance targets in Washington State Forest Practices Rules with data from mature, unmanaged, conifer-dominated riparian stands. Northwest Indian Fisheries Commission, Olympia, WA.
- Washington Department of Natural Resources. 2007. Habitat Conservation Plan, Olympia, Jennifer M. Belcher – Commissioner of Public Lands, Olympia WA.
- Washington Department of Natural Resources. 2013. Olympia Experimental State Forest HCP Planning Unit Forest Land Plan. Revised DRAFT Environmental Impact Statement, Olympia, WA.

# North Olympic Timber Action Committee (NOTAC)

Comments Received

DNR SEPA CENTER

Re: OESF Forest Land Plan & Revised Draft Environmental  
Impact Statement dated October, 2013

December 16<sup>th</sup>, 2013

To Whom It May Concern;

The North Olympic Timber Action Committee (NOTAC) commends the Department of Natural Resources for publishing a professional document and holding public informational meetings. Please consider the following NOTAC comments regarding the Olympic Experimental State Forest HCP Planning Unit Forest Land Plan and revised Draft Environmental Impact Statement dated 10-2013.

NOTAC prefers the Landscape Alternative providing both timber harvest and natural resource protections. We are, however, concerned that there should be a third alternative that maximizes long term beneficiary revenue while still fulfilling state and federal laws. Also, without knowing specifically what the OESF allowable cut will be and without knowing the effect on the allowable cut of the to be developed Marbled Murrelet Strategy, we cannot determine which alternative is best for the beneficiaries. We recognize that these are Board of Natural Resources policy issues but they have significant effects on the Forest Land Plan and on revenue to Trust Beneficiaries. They need to be addressed before the final plan is adopted.

Forty Three percent of the OESF land base is classified as long term deferrals (page 3-5) that are not considered for commercial timber harvest and may never be harvested. Since they are being held in reserve until younger areas grow into desired habitat, it should be possible to estimate when this will occur and schedule the harvest of these deferred acres accordingly. The total area restricted from timber harvest appears to go well beyond the Habitat Conservation Plan requirements. We question whether the current BNR policies and objectives used to develop this plan fulfill the fiduciary trust responsibility.

NOTAC believes there should be clear accounting of the cost/benefits of both alternatives so that the general public and trust beneficiaries know what the ecological costs will be. We would like to see a decade by decade schedule of expected trust beneficiary revenue for the two considered alternatives.

Peninsula Cities and Clallam County are struggling with the financial burden of regulations being passed down to already depressed budgets. Clallam County and the City of Port Angeles are being crushed by numerous state and federal environmental clean-up mandates. The Port Angeles School District needs an estimated seventy million dollars to replace schools that are far beyond their life expectancy. How much revenue is being lost on the deferred acres that the school construction fund would have to help fund more school construction? We need more certain revenues from trust lands and NOTAC does not see how either of the two alternatives gets us there.

The North Olympic Timber Action Committee is concerned that this plan too conservative! We need to understand when these deferred acres will become revenue to the trusts! If the BNR placed a higher ecological value over revenue production for this plan, then we need to know when or if the foregone revenue will ever be recovered! The reality is that the remaining 57% of the land base that is available for harvest will be significantly reduced by harvest regulations and that is why it is important for everyone to understand the real cost of ecological protections.

Thank you for allowing us to comment. We all want to do the right thing, but understanding what that is, and getting agreement from all involved is certainly the challenge.

Sincerely,

Carol Johnson

Executive Director

North Olympic Timber Action Committee

# Olympic Forest Coalition (OFCO)

Comments Received



Olympic  
Forest  
Coalition

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*Promoting the protection, conservation and restoration of  
natural forest ecosystems and their processes on the Olympic Peninsula,  
including fish and wildlife habitat, and surrounding ecosystems*

December 16, 2013

## **CONSERVATION ORGANIZATIONS' COMMENTS ON**

*Olympic Experimental State Forest HCP Planning Unit Forest Land Plan  
Revised Draft Environmental Impact Statement 2013*

Washington State Department of Natural Resources  
File No. 10-060101

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## **C. ENDORSEMENTS**

- 1. Conservation Northwest**
- 2. Washington Environmental Council**



**Olympic  
Forest  
Coalition**

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*Promoting the protection, conservation and restoration of natural forest ecosystems and their processes on the Olympic Peninsula, including fish and wildlife habitat, and surrounding ecosystems*

The Olympic Forest Coalition is submitting comprehensive comments on the DNR OESF LANDSCAPE PLAN & RDEIS. 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 policies, which aren't experimental.
- The RDEIS fails to consider an alternative "with less environmental impact." A violation of SEPA
- The RDEIS fails to consider an alternative that meets the 1997 HCP.
- The RDEIS and Forest Land Plan are premature until completion of the HCP Marbled Murrelet Long-Term Conservation Strategy.
- The Landscape Alternative cuts riparian buffer widths by about half and significantly increases the harvest in those buffers over those in the DNR HCP.
- The marbled murrelet Memo for the Landscape Plan emphasizes only the deferral of known nesting habitat, but habitat buffering and disturbance avoidance are optional measures.
- It omits mention or analysis of impacts on the Threatened Bull Trout and Ozette Sockeye, on which the FWS has written Biological Opinions describing needed protections.
- The Landscape Estate Model used for the Landscape Alternative is internal to DNR and is not available for peer review.
- Landscape Plan seems to have failed to include the Demonstrations Projects required in the Settlement Agreement, WEC vs. Sutherland, section II.A.

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:

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Signature

Conservation Northwest  
Organization Name

December 13, 2013  
Date



**Olympic  
Forest  
Coalition**

*Promoting the protection, conservation and restoration of natural forest ecosystems and their processes on the Olympic Peninsula, including fish and wildlife habitat, and surrounding ecosystems*

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

\_\_\_\_\_ Miguel Pérez-Gibson \_\_\_\_\_  
Signature

\_\_\_\_\_ WEC \_\_\_\_\_  
Organization Name

\_\_\_\_\_ 12/15/13 \_\_\_\_\_ Date

## BIOGRAPHIES

**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.

**Peter Goldman** graduated from Seattle University's School of Law in 1984. After clerking for Washington State Supreme Court Justice James M. Dolliver, Peter joined the criminal division of the King County Prosecutor's office, where he spent 11 years as a trial lawyer in all of the office's divisions. During his last five years, Peter was a Senior Deputy Prosecuting Attorney in the Appellate Division, where he handled over 200 complex criminal appeals. In 1997 he founded Washington Forest Law Center committed to applying the law and the best available science to protect Washington's 10 million forested acres. We provide free legal services to environmental organizations that are concerned with the protection of Washington's forests.

**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.

**Janeen Porter & Don Hamerquist** have lived and worked on the Northwest Olympic Peninsula for the past 15 years. Their family has been in the area for seventy five years. They are familiar with salmon restoration and industrial forestry issues on both state and private forest land. Janeen graduated from Marlinton High School in Ohio. Don graduated from Clallam Bay High School in Washington.

**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 a trustee for the Northwest Fund for the Environment and a board member of Conservation Northwest.

**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.

**Derek Poon**, BA Zoology, UC Berkeley 1967; Ph.D. Fisheries, Oregon State University 1977. Currently Natural Resource Consultant on adaptive management, ESA and CWA. Recently retired as Regional Salmon Ecologist and ESA Specialist at US EPA, and had worked as NOAA ESA biologist, Washington Timber Fish and Wildlife Policy Group Administrator, Washington King County Natural Resource Planning Chief, Northwest Power & Conservation Council-designated reviewer, and manager of private organizations.

**Jill Silver**, B.A.S. in Environmental Studies and Sciences, The Evergreen State College, 1992. As Director of 10,000 Years Institute since 2003, Jill develops and implements environmental research, monitoring, restoration, and community education programs to support sustainable natural resource management objectives in forested watersheds and ecosystems. Her work in the OESF spans 21 years, including field surveys in the study of pileated woodpeckers, marbled murrelets, and Northern spotted owls; salmon habitat ambient monitoring, water quality monitoring, invasive species detection and control, and forest practices rule development and review.

**Darrell Smith** (Port Townsend) began his forest work in the mid-1980s by analyzing the emerging Northwest National Forest plans, locating spotted owls and mapping forest habitat. Since 1986 he has worked professionally as a biologist, naturalist, and scientist in the fields of wildlife and wildlife habitat, fisheries biology, and stream and wetland biology. As a biologist and watershed steward, he has extensive experience in wildlife and fisheries habitat mapping, evaluation, and restoration. He has a B.S. in Wildlife Biology and did his M.S. work in Fisheries and Wildlife Science. He and his wife are avid and experienced birders and photographers, and for the past four years guided and operated a low-budget birding and guide service in Central America, where they also worked with the Rainforest Biodiversity Group to locate and evaluate habitat for the Mesoamerican wildlife habitat corridor. He currently works with the non-profit Western Wildlife Outreach as a large carnivore biologist.

**Shelley Spalding**, B.A. University of California, Davis 1966, 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.

**Dave Werntz** serves as Science and Conservation Director at Conservation Northwest. He has an M.S. in Forest Ecosystem Analysis and Conservation Biology from University of Washington and a B.S. in Biology and Environmental Studies from Grinnell College, Iowa. He has been at Conservation Northwest since 1994, 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**, BA in Biology from Luther College in 1996, MS in Behavioral Ecology from the University of Wisconsin-Milwaukee in 2000, and PhD in Urban Ecology from the University of Washington in 2007. Kara is the Staff Scientist & Policy Analyst at the Washington Forest Law Center where she performs spatial and technical analyses on topics ranging from endangered species management to forest certification and geomorphology. She currently serves on the Northern Spotted Owl Technical Team and the Northern Spotted Owl Conservation Advisory Group for Washington State.

## **PART I: MAJOR LEGAL CONCERNS UNDER SEPA**

December 16, 2013

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

Re: Comments on Revised DEIS for the Olympic Experimental State Forest

Dear Mr. Torgerson:

The following comments are submitted on behalf of the Olympic Forest Coalition and are intended to supplement other comments from Coalition members and technical experts.

At the outset, I would like to congratulate DNR on a vastly improved Draft Environmental Impact Statement. It is clear that DNR read and has responded to many of our comments on the 2010 Draft. Unfortunately, the Revised DEIS is still seriously deficit in at least the following ways: (1) the RDEIS and proposed Forest Land Plan are premature until DNR has completed and implemented its Marbled Murrelet Long-Term Conservation Plan; (2) The RDEIS is inadequate in only considering the “no action” and “landscape alternative” and failing to consider an alternative that actually complies with the 1997 HCP; and (3) the RDEIS is inadequate for failing to consider an alternative that meets the state objectives but with reduced environmental degradation.

Once again, the Revised DEIS should be withdrawn, and once DNR has adopted its Marbled Murrelet Long-Term Conservation Strategy (MMLTCS) the DEIS should be reissued with an alternative that complies fully with the HCP, complies with the MMLTCS as well as all federal and state laws and trust duties.

**A. The RDEIS and Forest Land Plan are premature until completion of the HCP Marbled Murrelet Long-Term Conservation Strategy.**

While the RDEIS identifies compliance with the March 7, 2013, “Memorandum for Marbled Murrelet Management Within the Olympic Experimental State Forest” as one of the proposed Forest Land Plan’s (FLP) “Objectives,” (RDEIS, 1-3), the RDEIS erroneously defers analysis of the proposed FLP on Marbled Murrelets to an unknown later date. (RDEIS 3-181). Indeed, rather than address the impacts on Marbled Murrelets, the RDEIS brushes off concerns by simply asserting that final adoption of the MMLTCS may lead to an amendment of the FLP. (RDEIS, 2-4).

DNR's team of consulting Marbled Murrelet scientists completed its Recommendations and Supporting Analysis of Conservation Opportunities for the Marbled Murrelet Long-Term Conservation Strategy ("Science Report") in 2008. The Science Report describes in detail how to manage Marbled Murrelet nesting habitat to contribute to 1) a stable or increasing population; 2) an increasing geographic distribution; and 3) a population that is resilient to disturbance. The Science Report should serve as the foundation for the MMLTCS and the OESF FLP because it was designed precisely to help meet the recovery objectives of the HCP. There is no excuse for failing to implement the Science Report, complete the MMLTCS, *incorporate* its requirements into the proposed FLP and evaluate the impacts of the FLP on Marbled Murrelets through the EIS process.

The 1997 HCP required prompt study, inventory survey and development of the long-term strategy "consecutively" and without delay. By failing to promptly complete and adopt the MMLTCS and incorporate its requirements into the proposed FLP and RDEIS, the RDEIS remains incomplete and fails to present a true alternative that is consistent with the full 1997 HCP.

The RDEIS correctly explains that adoption of the FLP falls within the "tactical" stage of DNR's planning process. (RDEIS 2-3 to 2-4). But it is not appropriate to move forward into the "tactical" stage until the "strategic" phase is complete. As the RDEIS explains "[p]olicies define DNR's basic operating philosophy, set standards and objectives, and provide direction upon which subsequent decisions can be based." Here, because DNR has not completed work on its MMLTCS, nor received approval from the federal agencies to implement the MMLTCS, DNR had not completed its strategic efforts. It remains premature to move forward with implementation.

## **B. RDEIS fails to examine more than one reasonable alternative**

Open-minded, imaginative design and consideration of alternative course of agency action is crucial to SEPA's ultimate quest – environmentally enlightened government decisionmaking. Indeed, the alternatives analysis is often described as the lynchpin of the EIS. Unfortunately, the RDEIS examines only the proposed action and the "no action" alternative.

SEPA mandates that an EIS examine "alternatives" to the proposed action. RCW 43.21C.030 (emphasis added). The term "alternatives" is plural not singular, thus requiring more than a single alternative to the proposal. This plural requirement is further explained in the SEPA rules. WAC 197-11-440(5)(a) requires the EIS to examine the proposal and "alternative courses of action." Similarly, WAC 197-11-440(5)(b)(ii) mandates that the "'no action' alternative shall be evaluated and compared to other alternatives." The SEPA rules require further that "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(5)(b).

The RDEIS fails to consider at least the following "reasonable alternatives."

### **1. The RDEIS fails to consider an alternative that meets the 1997 HCP**

While the RDEIS states that one of the FLP's objectives is to meet the various conservation strategies required by the 1997 HCP, it appears to fall short in at least two categories. First, as discussed above, the FLP does not satisfy the requirements for establishing and meeting a long-term Marbled Murrelet Conservation Strategy. As explained further in the comments of Kara

Whittaker, PhD, it is clear that simply implementing the March 7, 2013 Memorandum on Marbled Murrelets (“OESF Memo”) referenced in the RDEIS will preclude conservation options for the MMLTCS. The OESF Memo could be implemented for another two years or more, further degrading marbled murrelet habitat conditions that will take many decades to restore. This is further illustrated by DNR’s recent proposals for the Rainbow Rock Timber Sale (Sale No. 90248) and Goodmint Timber Sale (Sale No. 90599) both of which will result in significant adverse impacts on Marbled Murrelets and DNR’s ability to protect and recover this species. OFCO’s SEPA comments, prepared by the Washington Forest Law Center (December 10, 2013), are incorporated by reference. Given the poor population status, the failure to consider an interim policy that is more protective, not less protective than the status quo “no action” alternative is a fatal defect.

Second, the proposed FLP does not meet the Riparian Conservation Strategies in the 1997 HCP and will not be protective of bull trout. The FLP and RDEIS both reduce the buffer widths and increase the harvest in those buffers over those in the 1997 HCP. In particular, under the RDEIS and FLP only 1% of streams would have Exterior buffers, compared to 75-85% of the streams under the 1997 HCP. Further, the proposed FLP assumes extensive entry and harvest within the riparian zone. Again, analyzing only one alternative that is less protective than the “no action” alternative and less protective than the 1997 HCP is a fatal defect.

Third, as explained in the comments of Dave Wertz from Conservation Northwest, the proposed FLP does not meet the Northern Spotted Owl Conservation Strategies in 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.

The DEIS must include at least one alternative that can feasibly attain the proposal’s objectives, including meeting the requirement of the HCP, protecting Marbled Murrelets and bull trout. Because the RDEIS does not include an alternative that actually appears to meet the 1997 HCP it is deficient.

## **2. The RDEIS fails to consider an alternative with decreased environmental degradation**

Even *if*, for the sake of argument, the proposed FLP were consistent with the 1997 HCP, the RDEIS still fails to consider an alternative that meets the stated objectives with *decreased* environmental degradation over the proposed FLP. To the contrary, upon careful examination, it appears that the relative negative impacts across multiple topics are higher for the proposed “landscape alternative” than the “no action” alternative. Consequently, the RDEIS must include an alternative with decreased impact – at least decreased impact from the “no action” alternative.

While, to its credit, the RDEIS does include some detailed relative information, the true relative impact of the proposed FLP is largely masked by the process followed to conduct the Environmental Analysis in Chapter 3 of the RDEIS. The RDEIS analysis is based a process that, instead of comparing relative impacts of the two alternatives instead attempts to lump relative impacts into broad, arbitrarily and ill-defined, “impact ratings.” (RDEIS, 3-14 to 3-15). By assigning arbitrarily definitions for ‘low, medium, and high’ impact ratings, the RDEIS lumps a range of impacts into one of the three arbitrary categories. And then, by comparing the “no action” alternative with the “landscape alternative” based only on the broad “impact rating” categories the RDEIS creates the illusion that the relative impacts between the two alternatives are similar or the same. By masking the relative impacts this way, the RDEIS fails to clearly

explain that the relative impacts are often worse for the “landscape alternative” than the “no action” alternative.

This masking effect is apparent throughout the Environmental Analysis contained within Chapter 3 of the RDEIS. For example, in *at least* the following analysis of impacts, it appears that the “landscape alternative” results in a higher degree of negative impact than the “no action” alternative:

- Table 3-15: In every Landscape, other than the Willy Huel, the projected percentage of state trust lands with potential high impacts from harvest and stand entries is higher for the “landscape alternative” than the “no action” alternative.
- Table 3-26: In almost every Landscape, the projected percentage of state trust lands with high impacts from soil compaction is higher for the “landscape alternative” than the “no action” alternative.
- Table 3-58: In every Landscape, other than the Willy Huel, the projected acreage of modeled old forest habitat on state trust lands is lower under the “landscape alternative” than the “no action” alternative.
- Table 3-59: In all but two Landscapes, the projected acreage of modeled young forest habitat on state trust lands is lower under the “landscape alternative” than the “no action” alternative.
- Chart 3-25: The projected amount of variable retention harvests within the area of influence for large woody debris will increase under the “landscape alternative” over the “no action” alternative.
- Charts 3-38 to 3-39: The distribution of watershed scores for riparian microclimate (a critical factor for protecting bull trout) demonstrate that there will be more “high impact” conditions during decades 6 and 9 under the “landscape alternative” than the “no action” alternative.
- Chart 3-82: Over the life of the analysis, it appears the each decade there are fewer projected acres of state trust lands in the OESF with habitat scores of 50 or above for the “landscape alternative” than the “no action” alternative.
- Chart 3-85: By decade 9 there are predicted to be more modeled potential spotted owl territories under the “no action” alternative than the “landscape alternative.”

Because the RDEIS fails to consider an alternative that meets the stated objectives but with reduced environmental degradation over existing conditions it is fundamentally flawed and must be rewritten.

Please do not hesitate to contact me if you have any questions.

Very truly yours,  
GENDLER & MANN, LLP



David S. Mann

## **PART II: TECHNICAL COMMENT PAPERS**

# **Analysis of Riparian, Stream, and Fish Habitat**

Mike Haggerty

Included below are my comments on the WDNR RDEIS. Please consider them as incomplete. The number and severity of problems in the RDEIS exceeded the time I had available to review and provide comments. My time constraints and the unnecessary complexity of the RDEIS prevented a more thorough review of all sections of the document.

## **SUMMARY OF COMMENTS**

The RDEIS fails to meet the measurable objectives that it establishes for itself and is unacceptable as written. Neither of the two proposed alternatives in the RDEIS provides the forest management strategies and minimum environmental protections that meet the letter and the intent of the 1997 State Lands HCP. As my more detailed comments will illustrate, this is not a credible analysis. Models are not substitutes for real world data and solutions, nor are they substitutes for experimentation and adaptive management. In order to have an analysis in which the modeled predictions can be trusted as reasonable you must have realistic model inputs, valid model assumptions and constraints, and faith in the analysts. None of these are present in this case.

One example of these problems in the RDEIS is the questionable modeling and lack of adequate real world data; in combination with numerous examples of inaccurately cited literature, direct falsehoods, and plagiarism, that make its "Fish Analysis" fatally flawed and unacceptable. A second example is its failure to clearly acknowledge the outcomes of the proposed Landscape Plan involve a drastic reduction in riparian buffer protections throughout the OESF as compared to the expected average buffer widths contained in the 1997 HCP buffering strategy for Type 3 streams, and a failure to meet the ESA mandated "minimizations and mitigations" contained within the incidental take permits. In addition, the environmental impacts of the Landscape Alternative were evaluated using flawed modeling techniques which produced erroneous results. The riparian analysis is fatally flawed and unacceptable as conducted.

My comments use the treatment of the Clallam LPU to illustrate some problems with the methodology and the policy recommendations. The RDEIS has major flaws in its modeling for achieving minimum NSO habitat requirements (20/40) in the Clallam LPU and does not achieve 20% old forest conditions for DNR managed lands within the Clallam LPU as required under the 1997 HCP. The RDEIS predicts that the Clallam Landscape will have greater than 20% of the landscape with "potential high impact" ratings. In addition, the RDEIS modeling does not provide an adequate analysis of fish and riparian habitat impacts in the Clallam Landscape and its proposals will result in an unacceptable reduction in riparian protections for its stream network.

My detailed comments are included below.

## Chapter 2 - Riparian Habitat

### Objective

The measurable objectives contained within the RDEIS do not adequately measure or represent the underlying riparian conservation strategy or objectives. The RDEIS states, "*protect, maintain, and restore habitat capable of supporting viable populations of salmonid species as well as for other non-listed and candidate species that depend on in-stream and riparian environments.*" The RDEIS sums these measurable objectives into four categories:

- Maintain or aid restoration of the riparian forest's potential to provide large woody debris to the stream channel.
- Maintain or aid restoration of the riparian forest's potential to provide shade to the stream channel.
- Prevent detectable increases in water quantity (peak flow) during storm events.
- Protect the integrity of riparian forests from severe endemic windthrow...severe endemic windthrow is windthrow in which 90 percent of an area will experience loss of at least 50% of the forest canopy.

Bullet one is not really a measurable objective because no criteria are provided with which to measure against. The method used in the analysis to describe environmental impacts does not address or insure the qualitative descriptions of maintaining or aiding a riparian forest's potential to deliver LWD are achieved. It appears the RDEIS simply tries to make sure the final impact score for LWD recruitment is lower than the initial score. Forest management decisions within the model are not constrained to maximize the potential future LWD recruitment from within riparian buffers adjacent to Type 1-3 waters (which would aid restoration). Recruitment potential within Type 3 basins are allowed to be significantly reduced during portions of the implementation period (as long as decade 9 ratings are equal or improved from current ratings).

Bullet three purports to prevent detectable increases in water quantity (peak flow) during storm events. The model is only looking at **one** variable to determine changes in peak flow and is unlikely able to detect other factors that can influence changes to peak flows, such as roads. Nonetheless I will focus my comments on the methods used by DNR to conduct this analysis.

The measurable objective is to PREVENT detectable changes in peak flow. This is not what the analysis evaluates. The analysis within the RDEIS uses qualitative ratings: Low, Medium, and High. The impacts are evaluated based reach scores which are calculated as:

Equation G-1. Stream Reach Score, a Measure of Reach-Level Impacts

$$\text{stream reach score} = \frac{\text{sensitivity}}{\text{potential}}$$

Reach score sensitivity is directly tied to the stream reach score which defines the level of impact. For example, stream reaches with low sensitivity ratings can only have low or moderate impact ratings. A reach with the lowest sensitivity rating (1) and the highest potential score (3)

would have an initial impact rating of 1.3 (lowest possible). If you reduce the maximum potential to the minimum potential (3 to 1), the reach rating score goes to 49.9; rating only a moderate impact. Conversely, stream reaches with high channel scores can never have a low impact rating even if hydrologic maturity is optimal. This is an illogical model structure to determine whether the measurable criteria are met.

The measurable objective is to: "Prevent detectable increases in water quantity (peak flow) during storm events". Potential is defined on a scale from 1 to 3: where one is the lowest potential (>20% increase in peak flow) and three is the highest potential (<10% increase in peak flow). When the potential score falls below 3 there is a modeled detectable increase in peak flow of more than 10%. Since channel sensitivity is constant through the modeling period any reduction in the stream reach score is therefore a modeled detectable increase in peak flow.

Type 3 watershed ID 102 is an interesting example. The minimum impact rating is 2.3 which corresponds to a sensitivity rating of 1.2 (likely range 1-1.2). The maximum rating score after decade 1 is 8.3 and occurs in decade 5, which corresponds to a change in potential from 3 to 2.3. This correlates with a modeled detectable change in peak flow of 13.5%. Yet the impact is rated very, very low. The system of modeling is complex whereas what is needed is quite simple. The potential score should never decline; a declining potential score is a detectable increase in peak flow greater than 10% and therefore does not meet the measurable objective criteria.

In addition, the sensitivity ratings for low gradient, unconfined channels are rated low and therefore can never experience a high impact rating. Low gradient, unconfined channels are often the most productive for salmonids and they can be highly sensitive to increases in peak flow. The low sensitivity rating for low gradient, unconfined channels used in the Landscape Plan deviates from ratings used in the OESF where watershed analysis has been conducted. For example, in the middle Hoh Watershed Analysis low gradient (<1%), unconfined channels were assigned a high sensitivity rating (Kennard 1999).

The fourth bullet above establishes a measurable objective for windthrow... "*Protect the integrity of riparian forests from severe endemic windthrow*". This is a significant divergence from the OESF HCP Riparian Strategy with respect to windthrow. The exterior riparian buffers (wind buffers) in the HCP are supposed to have several functions in addition to minimizing windthrow (e.g., help maintain channel-floodplain interactions, moderate microclimate, shield inner buffer from physical and ecological disturbances, and maintain diverse habitat for riparian and upland biota). DNR defines endemic windthrow as "windthrow that results from routine peak winds with short return intervals (less than 5 year recurrence interval [RI]). They further state that they cannot and do not protect against catastrophic windthrow. They define catastrophic as events that occur at recurrence intervals greater than 20 years.

This is similar to designing culverts that pass the 2 year flood but not the 5, or 10, or 20, or 50, or 100 year flood. While predicting wind and windthrow is much more complex than predicting flood events, protecting for only high recurrence interval damaging winds and not moderate recurrence interval winds is extremely inconsistent with the goal of the HCP to minimize riparian windthrow from damaging winds. The RDEIS does not consider the 5 year, or 10 year, or 15 year recurrence interval wind event. Yet these events, as well as catastrophic wind events are

part of primary hypotheses included in the riparian conservation strategy within the OESF portion of the HCP.

Another important factor to consider is the way that DNR determined what equates to severe endemic windthrow. DNR defines severe endemic windthrow as windthrow in which 90 percent of an area will experience 50 percent canopy loss (I want to point out that the area, as has been applied outside of the OESF includes the entire stream length and not the windthrow prone area). The threshold was selected since it represents a level of canopy loss in excess of what would occur under the riparian silvicultural prescriptions permitted in DNR's 2006 Riparian Forest Restoration Strategy. DNR further states that windthrow that results in canopy loss below this severity threshold is not considered to have a significant, adverse impact to riparian function.

Not only does this approach fail to meet the HCP standard for *minimizing* windthrow it fails to consider the effects of significantly reduced riparian buffers to wildlife and the development of NSO habitat. Consider the combined expected average buffer width described in the HCP for Type 3 streams of 250 feet, on both sides of the stream to what is now being proposed; 100 foot buffers (however the actual average buffer width appears to be 97ft during decade 1). This results in a 60% reduction in the combined buffer width described in the HCP which will make smaller stands, with most of the stand along edges. The HCP clearly states, "*All conservation, research, and management strategies were designed in concert to achieve an integrated management approach. Conservation measures for upland species, hence, rely in part on the riparian conservation strategy to meet their short- and long-term objectives. For example, proposed buffers on streams and streamside habitat account for more than 50 percent of habitat projected for the northern spotted owl on DNR-managed lands within the Experimental Forest.*"

The RDEIS establishes new management "prescriptions" and/or policies for implementing the riparian conservation strategy by essentially eliminating the exterior buffers without following the guidance established in the HCP. The HCP states "*This riparian strategy treats the design and the layout of the exterior buffer in two ways:*

- (1) it intends light partial harvests, tailored to local landform and meteorological conditions, as an initial management approach (see discussion below);*
- (2) it relies on experiments, from which DNR can gain new knowledge to improve management techniques in riparian forests."*

The experimentation on exterior buffers never occurred. Instead DNR redefines "minimize windthrow" to include only minimizing one narrowly defined category of windthrow- severe endemic windthrow. The substantial differences between the HCP defined riparian widths and those in the RDEIS Landscape Alternative should require an amendment to the HCP.

## Chapter 2 - Riparian Habitat

### *No Action Alternative- Riparian*

The riparian management description lacks sufficient detail to determine the extent of the interior-core buffer. The RDEIS states, "*The width of interior-core buffers will vary according to site conditions, such as the width of the floodplain and the size of potentially unstable areas, and may be modified per the results of the twelve-step watershed assessment process as described later in this section. Interior-core buffers will be applied to all Type 1 through Type 4 streams on stable ground. Type 5 streams on stable ground will not receive an interior-core buffer. All streams on unstable ground, regardless of type, will be protected with an interior-core buffer that encompasses the stream and the entire potentially unstable area. DNR does not anticipate that harvest activities (variable retention harvest or thinning) will occur inside interior-core buffers under the No Action Alternative.*"

I can't tell what is being protected? It can be interpreted to mean that only the floodplain and potentially unstable slopes are included within the interior-core buffer. This has been the recent strategy used by WDNR for many harvest units where interior-core buffers average 0-20 feet, followed by an exterior buffer of ~150 feet along Type 1 through 3 streams (OFCO 2007). This is significantly different from the HCP which states, "*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.*"

It is unclear for Type 1-3 and Type 4 streams how this would meet the commitments contained within the Incidental Take Permit(s) (ITPs). One permit (NMFS 1999) states, "*The principal function of the riparian buffer is protection of salmonid habitat; the principle function of the wind buffer is the protection of the riparian buffer*". The ITP includes "*minimization and mitigation measures*". Type 1-3 streams receive a conservatively managed buffer equal in width (measured 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 prescription should result in average riparian buffer widths of 150-160 feet. Outer wind buffers apply where needed. The USFWS amended ITP for bull trout describes measures to minimize or mitigate. "*All fish-bearing streams receive a conservatively managed 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 150 feet, whichever is greater. The first 25 feet is a no-harvest zone. Perennial streams without fish (Type 4) receive a 100-foot buffer.*"

## Chapter 2 - Riparian Habitat

### *The Proposed Action Alternative- Riparian*

The Landscape Alternative redefines how the HCP riparian conservation strategy will be implemented on the ground. The no action alternative is flawed because it only protects the 100-year floodplain and unstable slopes with an interior buffer and depends on exterior buffer to

achieve a portion of the required riparian functions. The proposed action alternative essentially removes the exterior buffer from the riparian management zone. Type 1 - 4 streams contain numerous reaches with little or no area classified as potentially unstable. If the exterior buffers were not applied to these stream segments there would be no riparian forest protected. Therefore, this new alternative was developed that reclassifies how the interior-core buffers will be managed. With exterior buffers essentially excluded the Landscape Alternative results in a significant decline in the expected average riparian buffer width for Type 3 streams. The reduced buffer width for Type 3 streams appears to average less than 40% of the HCP expected buffer width of 250 feet. Type 1 and 2 streams appear to have a greater than 50% reduction in the HCP expected buffer width of 300 feet.

The RDEIS describes the interior core buffers for Type 1 and 2 streams as 150 feet and for Type 3 and 4 streams 100 feet. The RDEIS then states, "*These buffer widths are the same for every Type 3 watershed and are based on the buffer widths proposed in the literature for several key watershed parameters.*" This appears to refer to the Table IV.10 in the 1997 HCP (a portion of the table is included below- **Figure 1**). As you can see, the proposed 100 foot buffers for Type 3 streams are narrower than the widths proposed in the literature for LWD recruitment, stream shade, microclimate, and water quality. This makes sense because the exterior buffers are intended to provide additional riparian function (see WDNR 1997).

Buffer width by stream type - proposed for the OESF					
Key watershed parameter	1	2	3	4	5
Mass wasting	150 ft	150 ft	100 ft	100 ft	0-500+ ft; depends on size of contribution area <sup>1</sup> and amount of unstable ground <sup>2</sup>
	all Type 1 streams will be protected	all Type 2 streams will be protected	all Type 3 streams will be protected	all Type 4 streams will be protected	
Mass wasting and windthrow combined	150 ft inner, 150 ft outer <sup>3</sup>	150 ft inner, 150 ft outer <sup>3</sup>	100 ft inner, 150 ft outer <sup>3</sup>	100 ft inner, 50 ft outer <sup>3</sup>	variable inner, 50 ft outer <sup>3</sup>

Buffer width by stream type - proposed in the literature <sup>4</sup>					
Key watershed parameter	1	2	3	4	5
Coarse-woody-debris recruitment <sup>5</sup>	108-168 ft	108-168 ft	105-153 ft	105-153 ft	105-153 ft
Stream shade availability <sup>4</sup>	108-168 ft	108-168 ft	105-153 ft	105-153 ft	105-153 ft
Riparian forest microclimate <sup>4</sup>	300 ft	300 ft	250 ft for >5-ft-wide channels	125 ft	
Channel bank stability	Commensurate with mass-wasting buffer protection on stream channels.				
Lateral channel migration	Commensurate with combined mass-wasting and windthrow protection on stream channels.				
Water quality <sup>5</sup>	108-168 ft	108-168 ft	105-153 ft	105-153 ft	105-153 ft

**Figure 1.** A screen shot of a portion of Table IV.10 (source: WDNR 2007).

These reduced buffers do not appear to comply with the requirements or intent of the HCP riparian conservation strategy, or the ITPs. Beyond this the Landscape Alternative allows at least some clearcut timber harvest from the already reduced riparian management zone (within

the interior core buffer). This is somehow justified by a poorly defined process. The RDEIS states, "*DNR analyzes the harvest schedule provided by the model to tally the total number of acres of variable retention harvests that are scheduled to occur within all of the interior core buffers of Type 1 through Type 4 streams on stable ground within each Type 3 watershed in each decade. The amount is generally very small: on average, only two percent (by area) of all the interior-core buffers in any given Type 3 watershed will be harvested by variable retention harvest in a given decade.*" Table A2-1 indicates that 1,227 acres (3.5%) of interior-core buffer will be clearcut logged during the first decade of implementation. Nearly, 50% of the projected interior-core buffer clearcutting is within the zone from 0 to 75 feet.

Figure 2.2 (in the RDEIS) implies this process might include reducing the buffer width where unstable slope width exceeds 150 feet for type 1 and 2 waters and/or exceed 100 feet for Type 3 and 4 streams. However, the process is not well defined within the RDEIS. My comments above for Chapter 2- Riparian Habitat- Measurable Objective bullet 4- windthrow also directly apply to this portion of the RDEIS. The Landscape Alternative reduces the current status quo management for Type 1-3 streams without providing any logical rationale. This is major change in how the HCP will be implemented on the ground and should require an amendment to the HCP. It seems illogical to apply the same riparian protection to non-fish bearing streams (Type 4) as Type 3 streams with ESA-listed species, or other salmonid stocks with depressed or critical stock status. This appears to have been taken account of in the 1997 HCP by providing for 3 times wider exterior buffers for Type 3 streams.

The comparison between alternatives in the RDEIS does not include a description of the acres of riparian habitat protected by each alternative nor a comparison between the acres projected to be protected under the HCP. It appears that much of the higher harvest levels in the Landscape Alternative compared to the No Action Alternative are a result of reduced riparian protection along Type 3 streams, but the document doesn't appear to contain this information. If the Landscape Alternative is accepted/adopted I recommend that the interior-core buffer for Type 1-3 streams be no less than a site potential tree height at age 100 or 150 ft wide whichever is greater (measured from the edge of the 100 year floodplain). There is little to no scientific rationale for different buffer widths based on stream type.

## **Chapter 2 Alternatives**

### ***Alternatives and Options Considered but Eliminated-Fixed width riparian buffers***

The RDEIS states that fixed width buffers were considered during the scoping process for the 2010 DEIS. That alternative would have included buffers equivalent in width to those proposed in the 1997 HCP. Harvest activities within riparian buffers would be restricted to thinning. The RDEIS states, "*This prescriptive approach (setting specific buffer widths based on stream type without a watershed assessment process) provides little opportunity for learning, which is a key attribute of integrated management.*"

However, the landscape planning process provides little apparent opportunity for learning. It appears to be mostly a fiscal tool for maximizing timber harvest and redefining riparian protections; that evaluates impacts using a set of models that contain constraints and goals that vary from the HCP. In my opinion, prescriptive riparian protections including the ESA "minimizations and mitigations" should be included for all Type 1-3 riparian areas where "formal" experimentation is not being conducted.

## Chapter 3 - Rivers and Streams

The RDEIS provides an inadequate discussion of the stream channel network as currently modeled (mapped). This is a huge problem given the complexity of the modeling effort undertaken. For example, Table 3-1 includes stream miles by water type for each land ownership type. No discussion regarding the accuracy of these estimates is provided. The only meaningful text on the subject is included in a footnote at the end of the subsection where the RDEIS states, "*The current GIS stream-layer is believed to underestimate the number of Type 5 streams...*" In my opinion, to only note that the number of Type 5 streams is underestimated is a misrepresentation of what is known. For example, a very simple comparison of DNR's Type 1-3 streams (as mapped) compared to the Forest Practices mapped Type F stream shows that 39% more stream length is classified as fish habitat (within DNR's ownership in the OESF). This is a significant difference that is known by DNR and taken account of within a portion of the modeling that was conducted, but that remains entirely hidden from the readers of the document. This point is important since it directly relates to the accuracy of modeling conducted, as well as the modeling outputs. Another problematic example relates to mapped essential fish habitat and Type 5 streams. Approximately 39% of modeled "essential coho summer rearing habitat" is mapped as Type 5 streams within the stream-layer DNR uses for the analysis. Why don't these models interact? In total 79% of the "essential coho summer rearing habitat" is mapped as non-fish bearing within the stream-layer being used by DNR...So which is it? How does DNR reconcile these vast differences in their modeling and mapping?

Maybe even more important is the total lack of discussion regarding the length of Type 4 stream present within the OESF. The RDEIS reports that only 14% of the mapped stream network is Type 4 water and over 61% of the stream network is less than 2 feet wide (Type 5). What portion of the Type 5 stream network is actually Type 4 water? No attempt has been made to understand the inaccuracy in the stream-layer. It appears that thousands of hours have been spent modeling the impacts at the reach level across the landscape, yet no time has been spent trying to define the real world channel network. It appears that much of the Type 5 channel network is actually Type 4 water. 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).

Data collected within the Hoh River watershed as part of the 2001 and 2002 Perennial Initiation Point Study (Haggerty 2001, Haggerty 2003, Palmquist 2005) showed that fewer than 5% of the

channel width measurements were less than 2 feet wide. At the statewide scale less than 20% of non-fish bearing channel width measurements were less than 2 feet wide (calculation omits Longview Fiber [LVF] see below). Yet the RDEIS projects that 82% of the mapped non-fish bearing stream network is less than 2 feet wide.

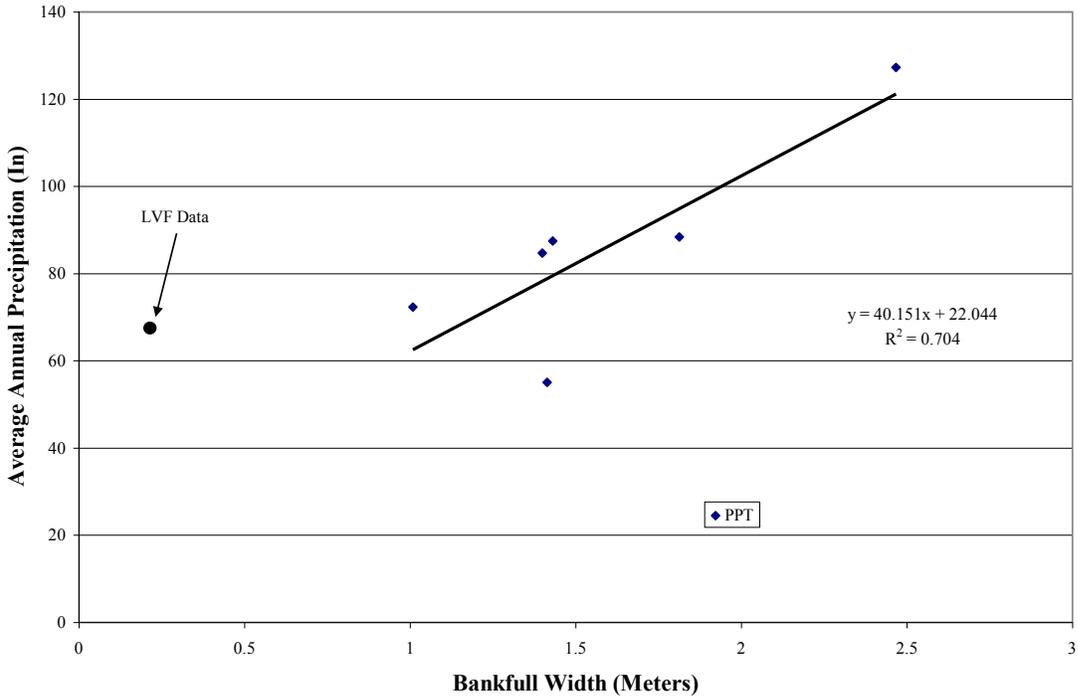
In order to describe the physical characteristics of headwater streams and roughly estimate the percentage of headwater stream length that meets the definition of Type 5 water, a review of the Perennial Initiation Point (PIP) study data was conducted.

The data for each Western Washington stream surveyed using the PIP study protocol was examined. The length and average BFW for each stream was tabulated. The maximum and probable length of Type 5 water was also determined for each stream surveyed. Where width data were absent, the surveys were excluded from the analysis. A total of 156 PIP surveys included sufficient data to type the streams as Type 4 or Type 5 water. The average width of Type 4 water was calculated by averaging all width measurements within the T-4 stream segment. The average width of Type 5 stream segments was not calculated. The length of Type 5 water was measured from the channel head or the end of channel, to the downstream water type break (where average width was equal to or greater than 2 feet). In some cases the break between Type 4 and 5 waters could not be precisely determined. In these cases the length of Type 5 water was classified in two separate categories: probable and maximum length.

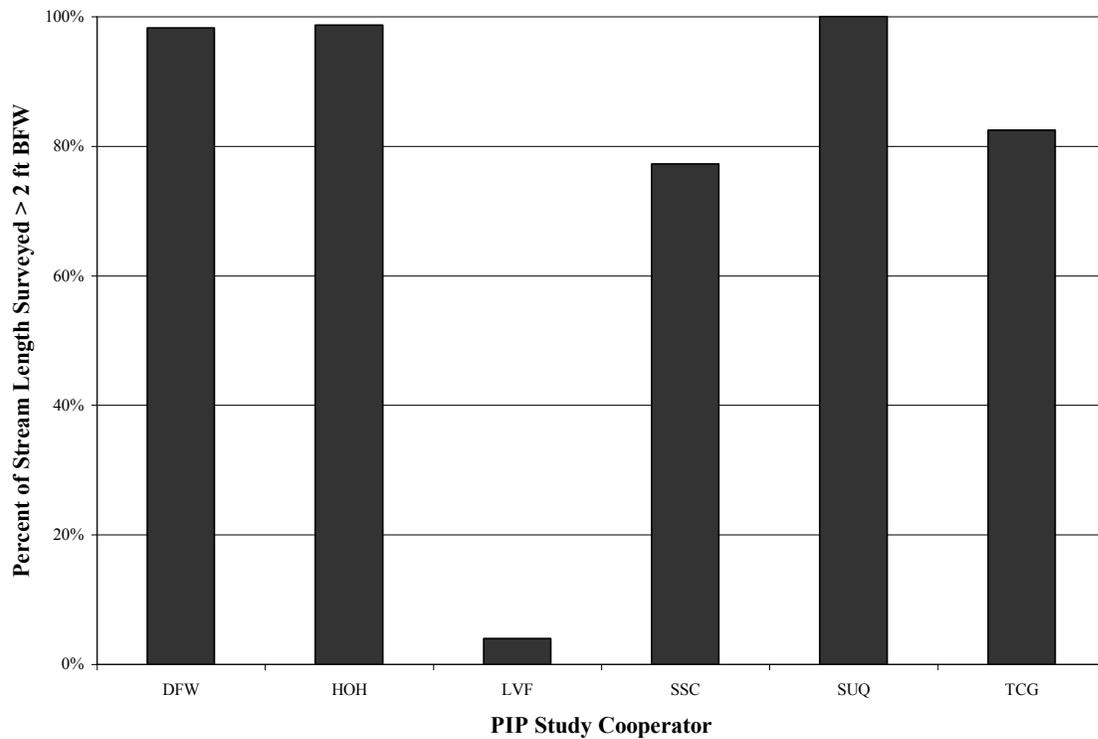
One of the PIP study cooperators channel data appeared suspect. The data did not appear to be collected following the CMER protocol. A comparative analysis of width measurements between study cooperators suggests that some width data were collected using faulty protocols.

All width measurements (n=1985) were summarized by study cooperator. BFW measurements ranged from 0.1 to 12.0 meters, averaging 1.4 meters. When BFW width measurements were examined by cooperator significant differences were found. For example, the Hoh Tribe's BFW measurements averaged 2.5 meters and the LVF BFW measurements averaged only 0.25 meters. One explanation for the variability between cooperators appears to be related to annual precipitation at the sites where PIP surveys were conducted. **Figure 2** depicts a significant ( $p<0.05$ ) relationship between average annual precipitation and average bankfull width for all PIP survey data except the LVF data.

Stream reaches less than 2 ft wide made up 18.9 percent of the stream length surveyed (including LVF data). However, within the LVF dataset streams less than 2 ft wide composed 96-percent of the stream length surveyed, providing further evidence that these data are outliers from the rest of the PIP survey data. **Figure 3** depicts the percent of stream length surveyed less than two feet wide by PIP study cooperator. It is important to note that PIP data collected by Skagit System Cooperative (SSC) were collected from the channel head downstream until 200 meters of continuous flow were recorded, therefore these data do not include the total length of the Type 4 stream network within the headwater channel. Most other datasets were collected from the confluence with a Type 1-3 stream, upstream to the channel head.

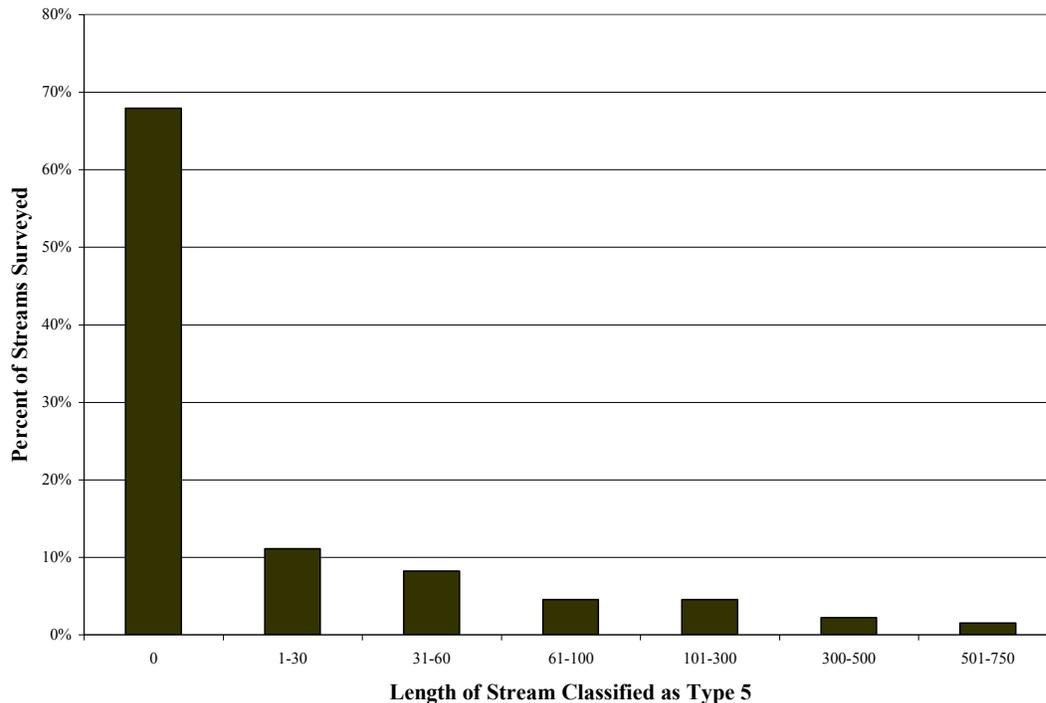


**Figure 2.** Comparison of average annual precipitation and average bankfull width.



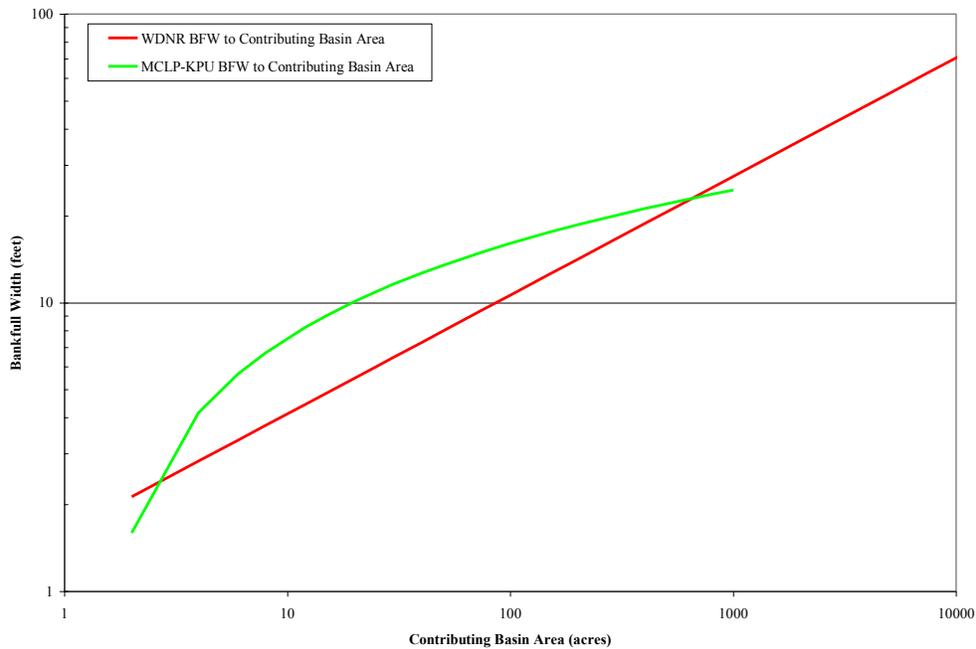
**Figure 3.** Percent of stream length surveyed meeting the definition of Type 4 water by study cooperator.

The Longview Fiber (LVF) dataset was not included in the final analysis due to suspect width measurements (see above). A total of 36,367 meters of PIP survey data collected in 134 survey reaches indicates that Type 5 streams comprised 12.5 percent of the channel network surveyed. Of the 134 streams surveyed 91 (68%) surveys contained no Type 5 water. Less than 10 percent of streams surveyed contained greater than 100 meters of Type 5 water. Less than 4 percent of the streams surveyed contained greater than 300 meters of Type 5 water (See **Figure 4**).

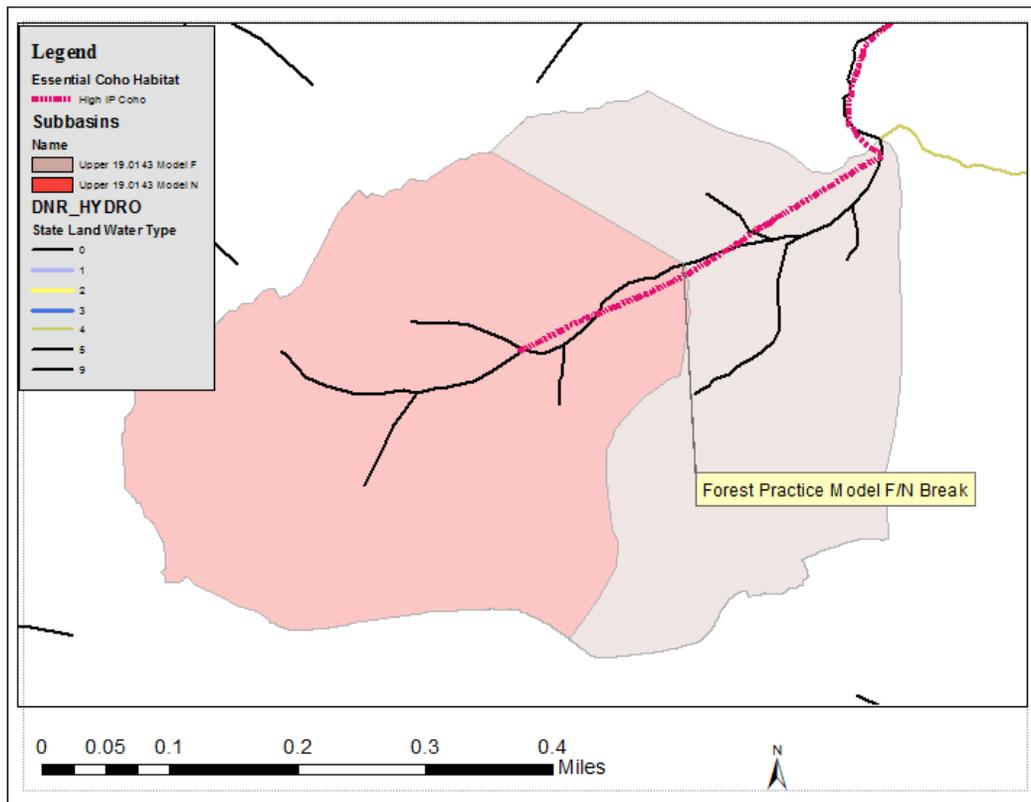


**Figure 4.** Percent of streams surveyed classified by length (meters) of Type 5 water.

The model DNR uses to calculate shade in Appendix G (Equation G-22) projects that stream width is greater than 2 feet once the contributing drainage basin approaches two acres (**Figure 5**). This fact suggests that that most streams mapped as Type 5 streams are actually Type 4 streams. Included below in **Figure 6** is an example of modeling conflicts taken from the Clallam Landscape in WRIA 19.0143 (locally referred to as Falls Creek). In the example there is a Type 5 stream with a basin area of 125 acres. One model (Equation G-22) assumes the channel is 11.6 feet wide at the confluence with the stream to the north, while the water type map estimates the channel is less than 2 feet wide (Type 5). Yet another model (FP Fish Habitat) estimates 1,000 feet of the Type 5 water is fish bearing. The contributing basin upstream of the modeled Fish/No Fish break is 74 acres. Here Equation G-22 estimates the channel to 9.4 feet wide, but the water type map estimates the channel to be less than 2 feet wide (Type 5). A third model estimates 1,500 feet of "essential coho summer rearing habitat" are included in this subbasin which is located upstream of a known and mapped anadromous fish barrier. This example is not an isolated problem. A quick comparison of stream type attributes and basin areas suggest this issue is wide spread throughout the OESF.



**Figure 5.** Comparison between WDNR RDEIS and Middle Coast-Landscape Plan Kalaloch Planning Unit Channel Assessment Module bankfull width to contributing basin area models (source: WDNR 2013; Haggerty 2004a).



**Figure 6.** Comparison of DNR State Land stream typing layer, with essential summer coho rearing habitat, and contributing basin area.

Issues with stream typing are not isolated to conflicting modeling errors; they also occur in the field during timber sale layouts. The information below is included to illustrate that some of the fundamental aspects of implementing the HCP are still inadequately applied in the field. Field based stream typing issues can be categorized into three categories:

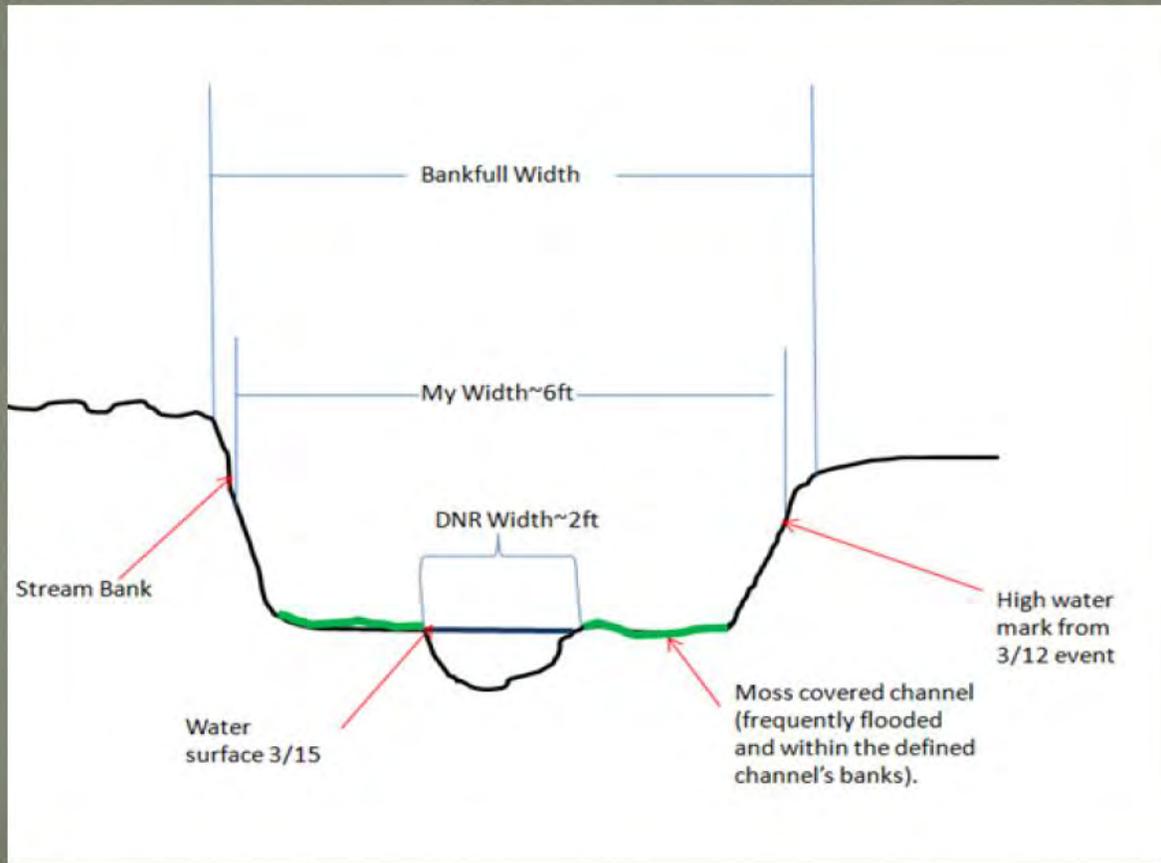
- Type 3 water upstream of Type 4 or 5 water.
- Type 3 water terminating at the end of well defined channels.
- Applying Type 5 water classification to stream channels with an ordinary high water width greater than 2 feet.

A stream channel is an incision into the ground surface where water and sediment are (or have been) concentrated and transported between stream banks. Defined channels can grade from well defined channels, to less well defined channels, to poorly defined channels. Poorly defined channels are a type of defined channel since they are an incision into the ground where water and sediment are or have been concentrated and transported between stream banks. It is often more difficult for a non-professional to distinguish the top of banks and ordinary high water width in these types of poorly defined channels. Other channel types are also present within the OESF, they include: piped channels, covered/buried channels, undefined channels, and channels within or on alluvial fans (other channel types are also likely to exist). In addition, channels can be indeterminate between wetlands and defined channels, creating a mosaic between wetland like habitats, with portions being well defined channels grading to poorly defined channels and wetlands.

At the policy level DNR has changed or reinvented the definition of a stream channel to exclude all channel forms that are not "well defined" from classification as Type 4 (Sackett 2013). The unilateral decision to only consider well defined channel reaches as Type 4 water excludes poorly defined channels from being classified as Type 4 water. This policy ignores state law relative to measuring and identifying ordinary high water width. DNR concludes that poorly defined channels are a type of channel but due to the nature of being poorly defined the OHWM concept is not applicable (Sackett 2013). DNR currently has no guidance on how to distinguish between well defined and poorly defined channel types. It appears to be left to the call of the field forester conducting the stream typing. DNR does not use stream hydrologists or fish biologists for stream typing in the OESF. The use of qualified hydrologists and biologists would help ensure streams are correctly typed on the ground.

Furthermore, DNR's ability to measure OHW width in the field is questionable. This results in frequent under-typing of stream channels. Included below are some examples from recent stream typing conducted by DNR followed up by a field review that I conducted (see **Figure 7** through **Figure 10**).

# Where are the edges of a defined channel?



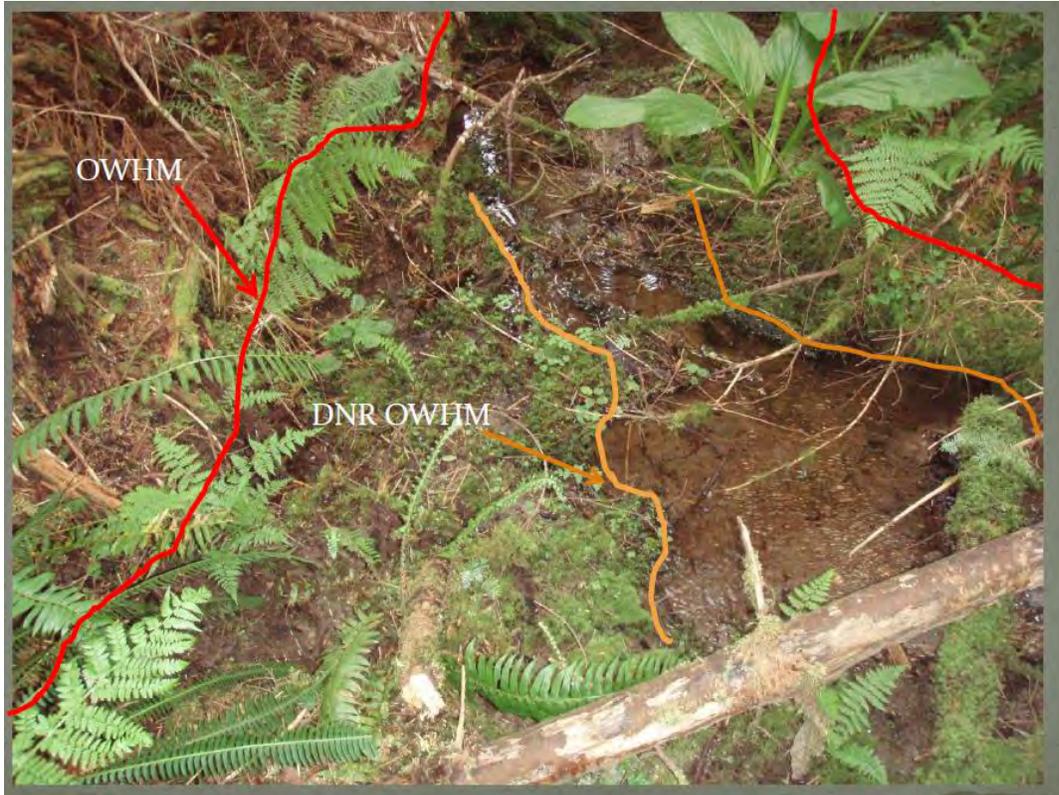
**Figure 7.** Cartoon depicting differences in how to correctly identify OHW width.



**Figure 8.** Comparison between DNR channel width measurement and OHW width in a Type 4 stream classified as a Type 5 stream. by DNR



**Figure 9.** Comparison between DNR channel width measurement and OHW width in a Type 3 stream.

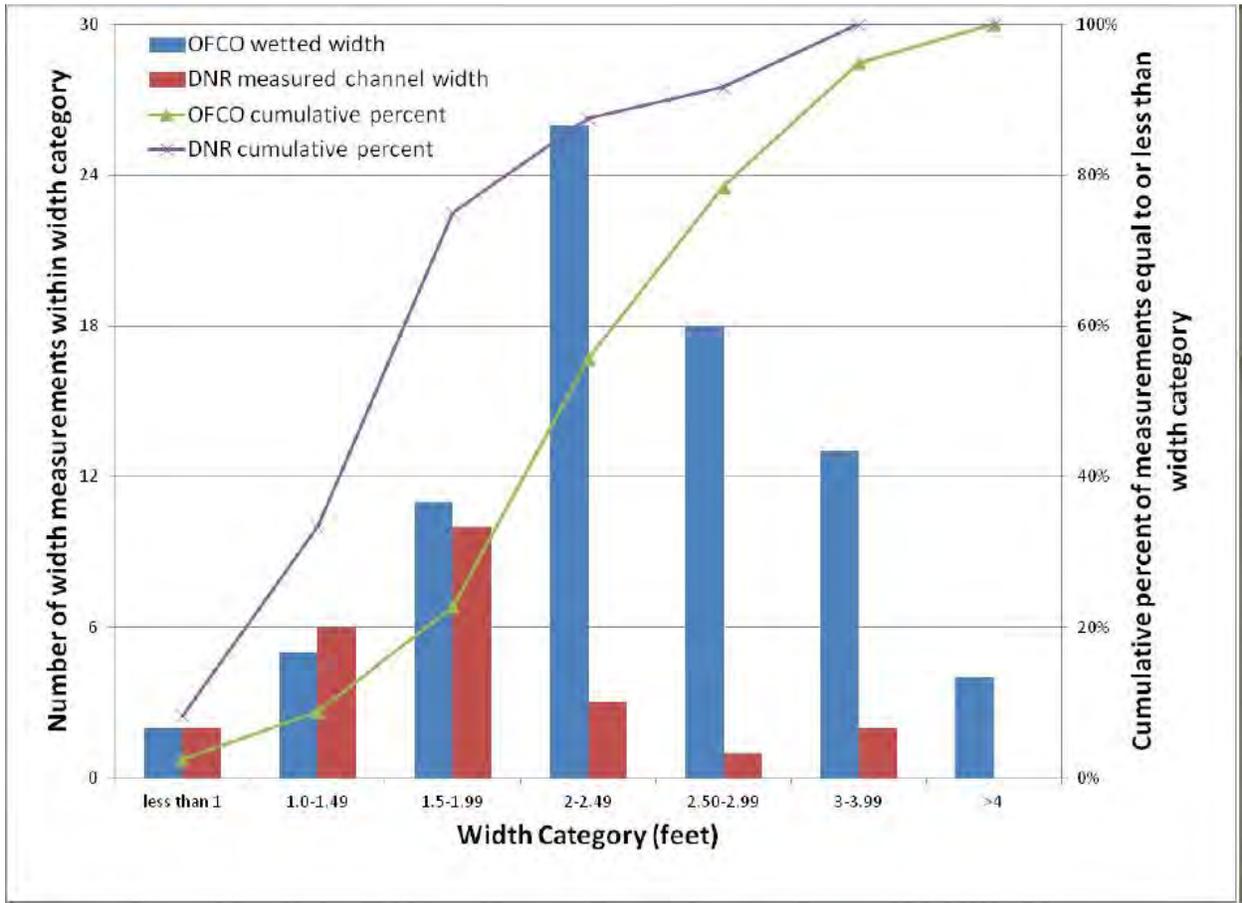


**Figure 10.** Comparison between DNR channel width measurement and OHW width in a Type 3 stream (based on physical habitat) classified as a Type 5 stream by DNR.

The stream in **Figure 10** was typed by DNR as a Type 5 stream, their average width measurements were 1.8 ft. However, a 750 ft reach had an average width 2 feet or greater based on their measurements! This stream meets the definition of Type 3 water. What is most alarming is that DNR's measurements over represent the narrowest portions of the channel. DNR's average channel width is less than 23% of the average OHW width I measured following strict protocols. DNR's width measurements underestimated OHW width, scoured width, and wetted widths at average winter-time discharges. We did a detailed follow up analysis on this stream reach. We collected measurements at 5 foot intervals: we measured only the wetted width within the scoured, vegetation free portion of the channel at streamflows significantly less than an ordinary high water event. The results are included below in **Figure 11**. The results strongly suggest that DNR staff need training in stream typing and the identification of OHW width.

The mistyping of streams can and has had significant adverse impacts. One recent example in the OESF was associated with the mistyping of a stream in Clallam Combined FPA (Unit 4) and Stumpy's Ride (Unit 5). The Clallam Combined FPA did not map the stream at all. The Stumpy's Ride FPA mapped the stream as a Type 5 (labeled stream 5x) up to the edge of the harvest unit. When right-of-way timber harvest was conducted for the Clallam Combined FPA Unit 4 road conditions were highly degraded and sediment and sediment laden waters were routed into this stream. At the downstream end of the road crossing turbidity readings averaged

978 NTU's, while the background turbidity in the downstream receiving water was 5 to 6 NTUs (stream 5W; see Haggerty 2013).



**Figure 11.** Comparison between DNR channel width measurements and OFCO wetted width measurements taken at 5 foot intervals within only the scoured, vegetation free portion of the channel at flows significantly less than an ordinary high water event.

### Chapter 3 - Deferrals and Operable Areas

The RDEIS states, "Table 3-3 shows the number of acres of deferrals and operable areas in each landscape in the OESF (landscapes will be described later in this section). Totals in Table 3-3 exclude acres of non-forested areas such as administrative sites, roads, and water bodies."

These excluded acres are a major change in the way the OESF acreage is "measured". The recalculation significantly reduces the acreage requirements needed to implement the NSO conservation strategy contained within the 1997 HCP. This is one area where the Landscape Plan does not meet the minimum requirements contained within the HCP. The HCP states,

*"DNR can meet its objectives for commodity production and spotted owl conservation 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 (after Hanson et al. 1993); and*
- (2) at least 40 percent of DNR-managed lands in the landscape planning unit in the stem-exclusion to old-growth stages that are potential old-forest, sub-mature, or young- forest marginal spotted owl habitat types (Hanson et al. 1993), including any old-forest habitat described in (1) above."*

HCP requires a minimum of 20/40 NSO habitat for DNR managed lands not- a subset of DNR managed lands within the landscape. This recalculation maneuver reduces the minimum NSO habitat requirements for the OESF by 5,113 acres or 5%.

The HCP further states, *"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 the current understanding of forest-ecosystem processes."* However, this is not how the Landscape Plan will be implemented. The Landscape Alternative directly targets the minimum requirements for old forest in several of the landscape planning units, and it fails to meet these minimum requirements in the Clallam Landscape. Table 3-58 shows a projection of 3,485 acres of old forest at decade 9 for the Landscape Alternative. It achieves the minimum target based on DNR's recalculation of the "forested" area within the landscape. The minimum target is achieved in decade 5 and then never exceeds 20% for the duration of the plan. Compare to the HCP which estimates **37%** of the landscape will be old forest at decade 10. So not only has DNR redefined how they calculate 20% they are treating this as maximum management level in the Clallam Landscape, when in fact they are not even meeting the minimum management target at the end of the planning period. The 3,485 acres of old forest they are modeling to exist at decade 9 is only **19.3%** of the DNR managed land within the landscape. Also note that modeled habitat often includes stands that have experienced severe windthrow damage and no longer function as habitat.

Furthermore, DNR is not accurately representing the methods used to recalculate the acreage by landscape. I investigated this for the Clallam Landscape where DNR is reducing the forested acres within the landscape by 764 acres (4.2%). I ran a spatial intersection using the DNR's parcel data only including "TIMRTFLG" attribute Y with the Landscape Planning Unit GIS Layer. I then recalculated acreage getting a result within 0.02% of the area reported in the RDEIS (these acres come from a Forest Estate Model query). I then ran an ArcMap spatial intersection with the newly created GIS layer and the 2013 DNR Transportation Layer. I then added a new length field and calculated the length of each road segment on DNR managed lands within the Clallam LPU.

I then conducted a detailed review of the NSO habitat proposed model GIS layer within the Clallam LPU. The review indicated that non-forested acres were calculated by placing a 25 foot

buffer on both sides of the transportation GIS layer. I then multiplied road length in feet (from spatial intersection described above) by the 50 foot right-of-way width and came up with 737 acres. New roads are not mapped in the transportation layer, but some (maybe half) are accounted for in the proposed NSO habitat maps. The new unmapped road acres equaled 10.1 acres that were accounted for in the NSO habitat mapping bringing the total accounted for acres to 748. A gravel pit (old honor camp?) and Lizard Lake appear to account for the remaining acres taken out of the landscape planning area acreage (there are some additional new roads unaccounted for and some abandoned roads that are now forested and accounted for as forested (e.g., the lower 4000 Road).

Removing roads and road right-of-way acreage appears to have been done for the sole purpose of reducing the minimum number of acres of NSO habitat needed. Using this logic the more roads you build the fewer acres of habitat you need restore. Allow an unlimited number of roads and you will not need to grow any old forest. Also, timber is extracted from the road right-of-ways during the creation of new roads and when old roads are reopened, thus yielding timber although not accounted for in providing NSO habitat.

One thing that is not excluded within the table is the actual surface area between stream channel banks of all except the very largest rivers (Hoh, Sol Duc, etc). For example, the area contained within the bankfull width of the Clallam River upstream of the estuary (not including) to the confluence with WRIA 19.0144 is 100.4 acres (from Haggerty and NOLT 2011). All of acres that are within DNR managed lands are classified as forested even though they are the banks and bed of a river. Total surface area of all stream channels is likely similar to the area of "non-forested" area removed from the "forested" landscape area calculation.

### **Chapter 3 - Analysis Process**

The RDEIS "quantifies" potential environmental impacts for each indicator as low, medium, and high using parameters defined for each indicator. In some cases the sensitivity of a reach can affect the potential environmental impact. Consider for example low gradient (<1%), unconfined channels that are erroneously given a low sensitivity rating for LWD recruitment. Therefore they can never experience a high impact rating. In this case a channel with a sensitivity rating equal to 1, with optimal riparian forest conditions rated a 3, can go to a rating of 1 (all riparian area removed) and the impact rating would be 49.9, considered a moderate impact. Take another example, channel sensitivity rated 2 and potential rated 3, the potential can be decreased to 1.7 and still be considered a moderate impact. This does meet the measureable conservation objective- Maintain or aid restoration of the riparian forest's potential to provide large woody debris to the stream channel. In many cases the riparian potential, and consequently the maintenance of riparian forest's potential to provide woody debris to a stream channel is reduced during the implementation period (due to modeling errors it is not possible to fully evaluate these impacts). For Type 3 streams the proposed action alternative only provides buffer widths capable of supplying a little less than 75% of the LWD from a 170 ft site potential tree height (SPTH) and under 60% of the LWD from a 225 ft SPTH.

## Chapter 3 - Analysis Process

### *Step Two: Assign a Potential Low, Medium, or High Impact Rating to Each Landscape*

This entire system of impact evaluation is illogical within the context of ESA, the HCP, the riparian conservation strategy, and measurable conservation objectives. For example, forestry related activities should not appreciably reduce the riparian habitat potential (especially not within the zone of potential impact for LWD recruitment). The goal is to maintain and aid in the restoration of riparian function. Short- and medium-term reductions in habitat potential should be limited to activities working to restore riparian function and not just clearcutting portions of the riparian area for timber production.

## Chapter 3 - Natural Disturbance

The RDEIS states, "*DNR does not analyze the potential environmental impacts of stochastic (random), large-scale natural disturbances such as major fires or windstorms because DNR is unable to predict or model the local likelihood of these disturbances.*"

This directly relates to the logic used by DNR to remove exterior riparian buffers. DNR has developed a model that predicts high RI windstorms (1-4yr) and redefined what windthrow levels are acceptable. Apparently DNR does not have a model to estimate moderate RI (5-20yr), or low RI (>20yr) windstorms, so they do not analyze the impacts. This likely violates the intent and protections provided within the HCP. The HCP states, "*Of the many factors affecting habitat for salmonids and riparian-dependent species, mass wasting and windthrow exert the greatest short- and long-term influences. Hence, this conservation strategy explicitly addresses these two driving factors by creating riparian buffers designed to minimize mass wasting and windthrow. A principal working hypothesis of this approach is that buffers designed to minimize mass wasting and blowdown will be sufficient to protect **other key physical and biological functions of riparian systems**.*"

Changing the HCP implementation in such a significant way without any attempt to estimate the impact on the environment or listed species is unlikely to comply with the ESA. It definitely does not "minimize or mitigate" impacts to listed species.

## Chapter 3 - Analysis Process

### *Table 3-10 and Appendix G*

This table does not accurately represent the land classification by alternative. The No Action Alternative riparian acres are not included in Table 3-10. Appendix D includes the attributes included in the analysis. Acres for the no action alternative for type 3 streams between 100 and 150 ft (would be attributed as 150i) are not included for comparison. I reviewed the GIS data

and I do not see the stands attributed for this riparian area. I estimate this is an additional 6,000 to 7,000 acres (10% more) of riparian area within riparian land classification. If you look at Appendix E, Forest Condition, you will see the plots include the same number of acres for both alternatives classified as riparian; these acreages are not the same and should be changed to accurately reflect the difference between the alternatives. These acres are the sum of the assumed channel and floodplain width (based on stream type), plus 75 feet on either side (for Type 1-4s), plus a zone from 75-100 feet on either side of the stream (for Type 1-4s) and a zone from 100 to 150 feet (for Type 1 and 2 water). In addition, the estate model also classifies a RIP attribute (theme 5) "e" which corresponds to the expected average exterior buffer width, these features are 150 feet wide for Type 1-3s and 50 feet wide for Type 4 waters.

**Table 1.** Comparison of acres of riparian area by estate model riparian attribute.

Landscape	Landscape Alternative Riparian 75i, 100i, and 150i	Landscape Alternative Riparian 75i, 100i, 150i, + Unstable slopes/CMZs, and Wetlands	Estimated Riparian (including 150i for Type3) and Unstable Slopes, CMZs, and Wetlands	Total Riparian Acres from Landscape Alternative and Expected Average Exterior Buffers from HCP
Clallam	2,113	3,831	NA	5,581
Clearwater	6,942	19,990	NA	24,956
Coppermine	2,858	6,383	NA	8,576
Dickodochtedar	3,639	4,876	NA	8,547
Goodman	3,453	4,686	NA	7,956
Kalaloch	2,620	5,231	NA	7,639
Queets	2,112	3,254	NA	5,532
Reade Hill	1,366	2,468	NA	3,664
Sekiu	1,138	1,938	NA	2,923
Sol Duc	2,414	3,892	NA	6,029
Willy Huel	6,835	12,981	NA	17,343
Grand Total	35,489	69,532	76,032	98,747

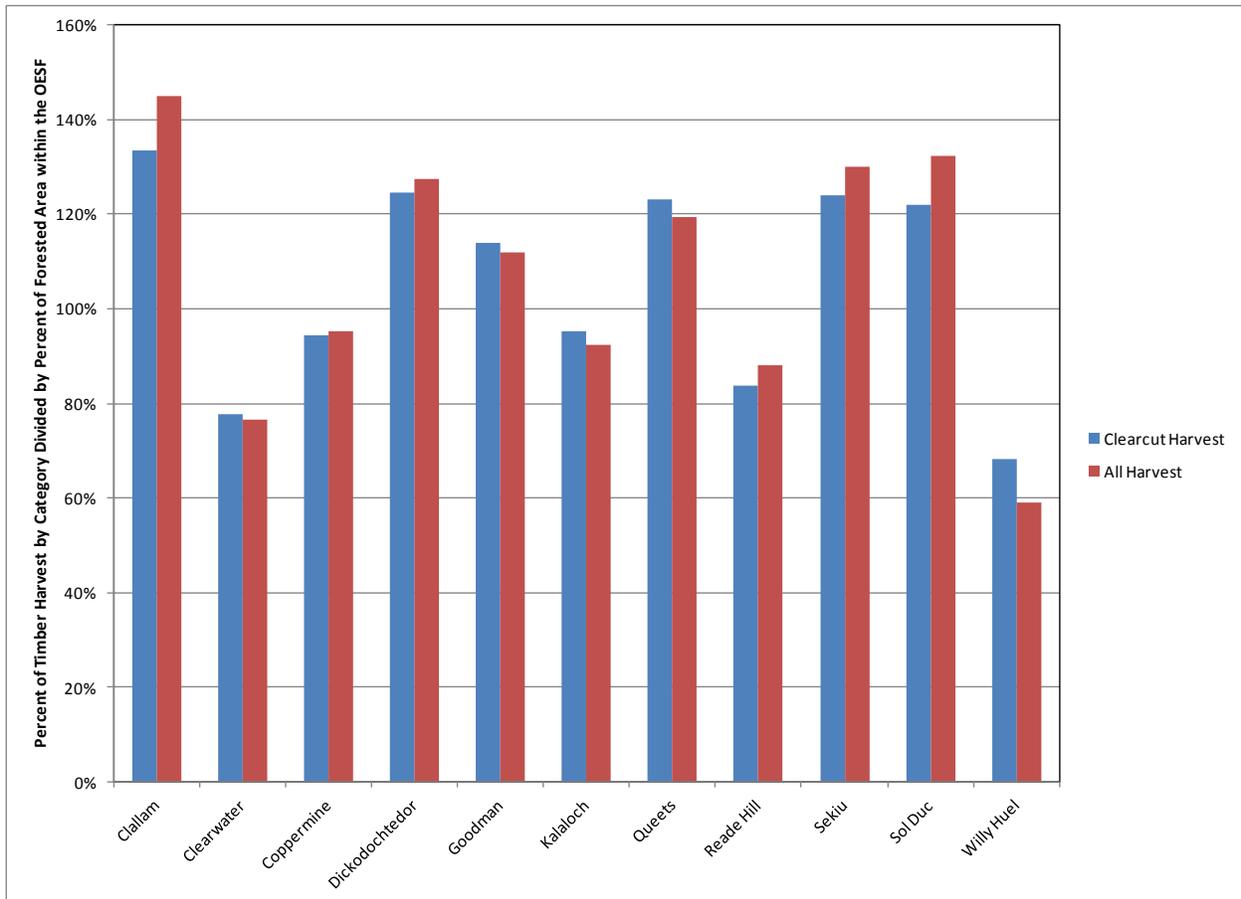
The Landscape Alternative appears to include 29,216 fewer acres of riparian habitat as compared to the expected riparian habitat included in the 1997 HCP.

### Chapter 3 - Analysis Process

#### ***INDICATOR: HARVEST METHODS AND NUMBER OF FOREST STAND ENTRIES***

The Clallam Landscape under the Landscape Alternative is considered to have high potential impacts. That is, more than 20% of the area is rated as having potential high impacts. It seems

unlikely that this complies with the intent of the HCP. There are likely multiple reasons for this (e.g. accelerated harvest of older forest, reduced riparian buffers, etc...). If you look at the proportion of the "forested" landscape you will see that the Clallam Landscape represents 6.7% of the OESF. The total percent of variable retention harvest in the OESF that is proposed to come from the Clallam is 8.9% and combined variable retention and thinning percent is 9.7%. This harvest is 33% and 45% greater than the percent of the forested landscape contained within the OESF. The Clallam has the highest rate of timber harvest of all LPUs (see **Figure 12**).



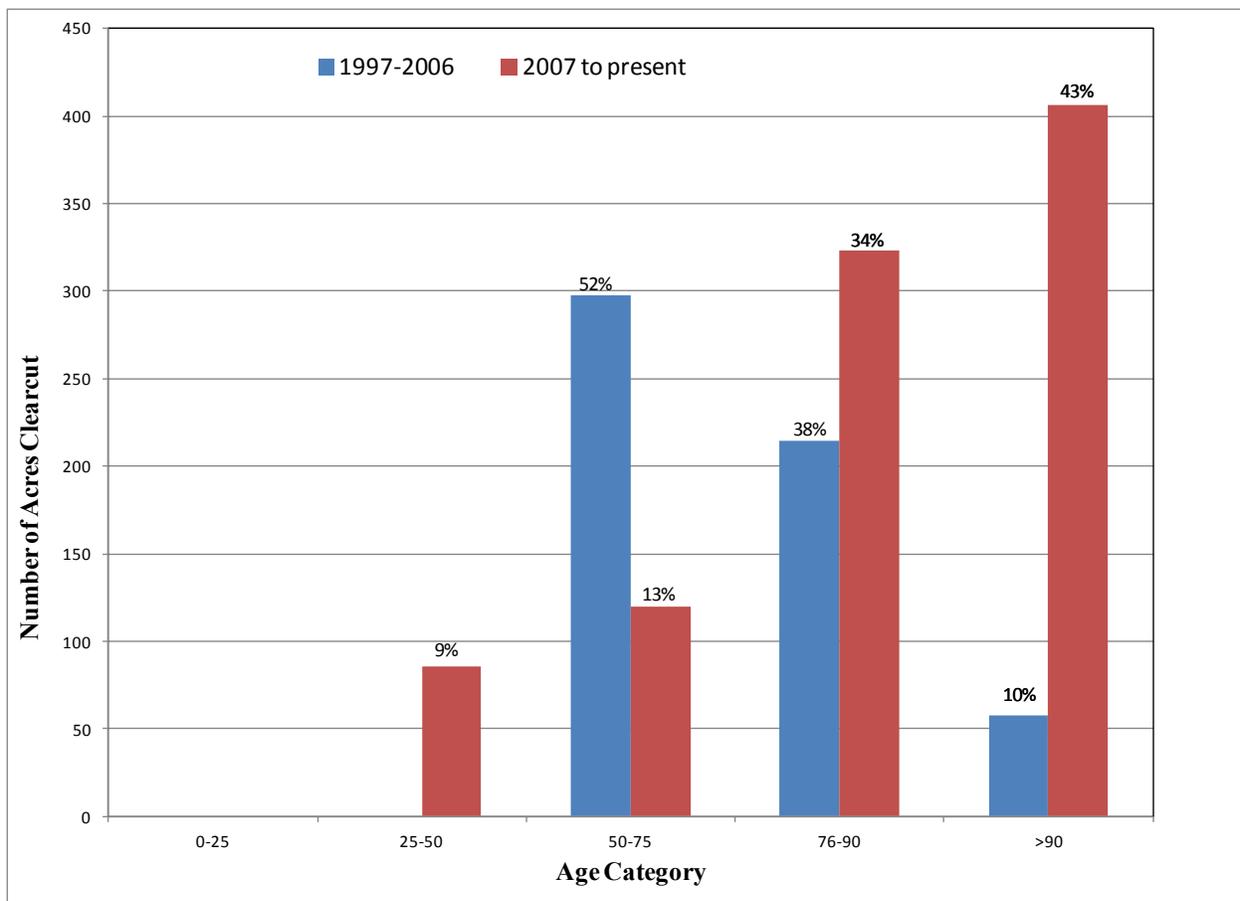
**Figure 12.** Comparison of percent timber harvested by harvest category divided by percent of forested area within the OESF.

The Clallam is expected to achieve 20% old forest conditions after 50 years (although it actually never achieves 20% using the HCP goals of 20% old forest for DNR managed land). Currently less than 2% of the forest is classified as old forest using the proposed modeling and definitions. An examination of the currently modeled stand ages in the Clallam indicates that 33% of the forest is older than 70 years, and 10% is 90 years old or older. The model does not appear to have constraints that minimize the time required to achieve old forest conditions.

In recent years there appears to a push to increase the harvest of older stands in the Clallam Landscape. I examined a portion of the Clallam Landscape where I had sufficient data on stand

ages and forest practices since the implementation of the HCP. The area is bound by the Clallam River owl circle (only because that is the only area that data are complete for).

Two periods were evaluated- early implementation (1997-2006) and recent implementation (2007 to present). During the early period a total of 613 acres were clearcut in the analysis area (61 acres per year). Stand ages were known or estimated for 570 acres. No inventory data were available for 43 acres. During the early period 10% of harvest was in stands greater than 90 years old and 38% was in stands 76-90 years old. The remaining 52% of harvest was in stands 50-75 years old. During the recent period a total of 946 acres were harvested or are in the process of being harvested. The proportion of harvested stands over 90 years old significantly increased during the recent implementation period. The proportion of stands greater than 90 years old that were clearcut went from 10% to 43%. Many of these stands may have been structural habitat but were not mapped as such. At least one stand that is being clearcut is mapped as Old Forest in the proposed mapping used in RDEIS. **Figure 13** depicts the acres clearcut in each time period, for each age category. The point is that recent harvest of older stands, the more intensive harvest proposed for the future, and reduced buffer widths have delayed the time to reach 20% old forest conditions and are in part responsible for the high impact rating for the Clallam Landscape.



**Figure 13.** Analysis area acres clearcut by age category within the early and recent HCP implementation period.

## Chapter 3 - Riparian Habitat

### *Stream Reach Scores- Channel Sensitivity*

Example LWD- Sensitivity ratings are erroneous since they only consider channel based sensitivity and do not incorporate fish habitat rule calls which over-ride channel sensitivity calls in watershed analysis; the basis of the methods used. I made this comment during the last review process, apparently most of that comment was entirely ignored. DNR has changed the channel sensitivity rating for streams over 20% gradient to moderate from low. However, the low gradient unconfined channel sensitivity rating remains ranked as low.

Within Appendix G the RDEIS states, "*The large woody debris sensitivity ratings used in this analysis were developed from a review of watershed analyses that were either initiated or approved under forest practices.*" This has been changed since the DEIS which stated, "*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.*"

I assume this change was based on previous comments that were provided regarding high gradient channels, as well as the fact that the references supplied did not support the methods used within the DEIS.

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.

The DEIS directly omitted 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.

The RDEIS gives a low sensitivity rating to unconfined streams less than 1 percent gradient. I could find no similar rating in any of the analyses. More importantly the RDEIS continues to define a generic channel sensitivity based on gradient and confinement. This is methodologically incorrect for evaluating impacts at the reach or subbasin scale (the intent of the analysis), as multiple stream types with different sensitivities can occur within and between gradient and confinement classes. Sensitivities to inputs are directly linked to channel geomorphic units (and fish habitat) 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). A generic sensitivity analysis has no direct linkage between the inputs and dominant channel- and habitat- forming processes at the stream reach scale. Consider also forced pool riffle channels which occur in 1-3% gradient channels, these channels can be especially sensitive to LWD inputs and wood loss. When roughness elements are lost channels can convert from a pool-riffle structure to a plane-bed channel. This can result in a significant reduction in spawning and rearing habitat used by salmonids (often negatively affecting coho salmon habitat in small to medium-size streams). The LWD sensitivity rating in the RDEIS is only medium for 1-2% unconfined channels. This does not make sense. A strictly gradient and confinement driven assessment totally disregards fish habitat forming processes which is another key goal of any channel assessment.

Failure to include habitat considerations in the channel sensitivity ratings affects the ability of the RDEIS to make accurate impact calls for some of the most important fish habitats within the OESF. Consider an important salmon spawning stream that is 0-1% gradient and unconfined, the sensitivity rating is 1. Now consider impact ratings, assume the potential is rated a 3 (highest potential), the impact rank would be 1.3. Now consider cutting down the entire riparian area and converting the potential score to 1, this would result in only a moderate LWD impact score. The measurable objective criteria for LWD recruitment is to- "maintain or aid the restoration of the riparian forest's potential to provide large woody debris to the stream channel". The only analysis needed to determine if this is met is an analysis of changes in the potential of a reach. That is if the potential declines then the measurable criteria are not met. However, the analysis does not use this approach, which in my opinion is another fatal flaw.

Consider the proposed buffers on Type 3 streams, a 100 ft buffer is projected to supply only 74% of the LWD recruitment of a 170 ft stand. The Landscape Alternative allows for a significant reduction in potential LWD recruitment. It is unclear how this maintains or restores riparian function for stands that are already functioning properly. Forest management that results in a decline in the potential to recruit LWD from a riparian stand adjacent to a fish bearing stream, should only happen in conjunction with restoration actions (whether in-stream, or thinning to

promote future riparian function [where appropriate]). The areas of influence considered for LWD recruitment for Type 1-3 streams should not include clearcut harvests.

## **Chapter 3 - Riparian Habitat**

### ***Stream Reach Scores- Proximity-Based Area of Influence***

The RDEIS determines the width of the channel and 100 year floodplain by applying a standard one size for one stream type model where: Type 1 = 300 ft, Type 2=120ft, Type 3=30ft, and Type 4=7.5ft. This analysis method is prone to numerous errors at the reach scale. Consider Type 1 streams, these can vary from large rivers to medium size streams with confined valleys. It appears that the issue for the largest rivers was partially addressed by removing the river channels from the GIS layer. But consider something like the upper Clallam River where it is still a Type 1 stream, the channel width is around 45-60 feet (from Haggerty and Clallam County 2008) and the river is confined (under 100 feet total including the 100 year floodplain). The method used over-represents the width of the 100 year floodplain and channel by at least 200 feet. For some Type 3 streams (lower Blowder Creek) the width is greater than 30 feet, contrast this with a very small confined Type 3 stream that might only be 5 feet wide. A model linking BFW to contributing basin and channel confinement could have been used to more accurately reflect expected 100 year floodplain widths. There are also issues with the stream layer and the actually spatial position of channels. In order to accurately model the area of influence and impacts at the reach scale (often only hundreds of feet in size) you would need to be able to accurately map the 100 year floodplain for typed waters; this is not possible in the OESF.

## **Chapter 3 - Riparian Habitat**

### ***How were watershed-level impacts assessed?***

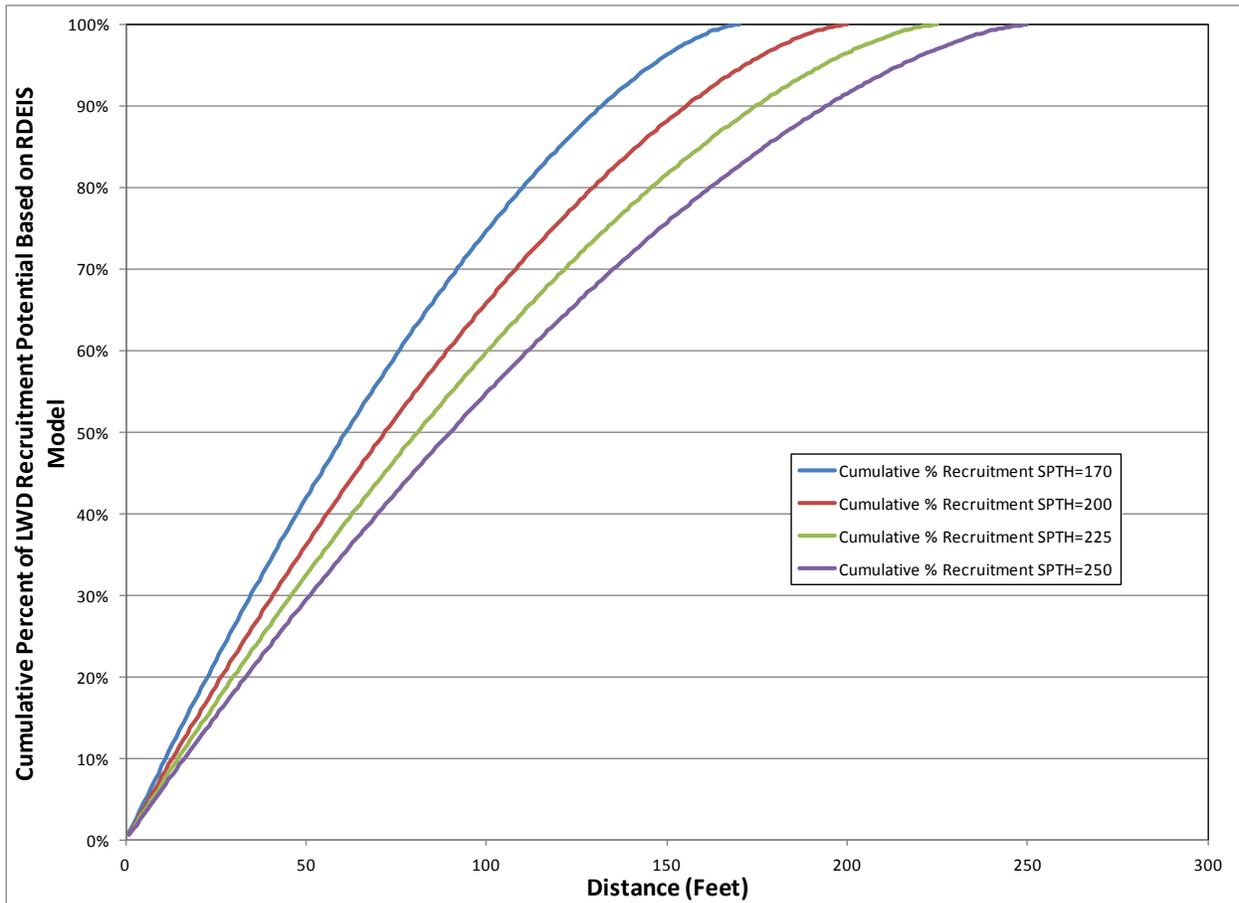
The system used weighted (based on length) stream rating scores to develop a watershed score. This does little to evaluate the impacts around the habitats being protected with a riparian buffer (Type 1-4s) and Type 5s with no buffer. This reporting method makes it difficult or impossible to evaluate changes to the stream reach scores for actual fish habitat. Also a system weighted on length alone does not provide habitat area (square feet of habitat) based analysis.

## **Chapter 3 - Riparian Habitat**

### ***How was Large Woody Debris Recruitment Potential Measured?***

The RDEIS states, "*For this analysis, a site potential tree height was defined as 170 feet.*" The rationale for providing this distance is the average distance used by FEMAT who defined the SPTH as the average maximum height of the tallest dominant trees (200 years or more in age). The RDEIS then continues by stating that for Type 1 and 2 streams the average SPTH at age 120

is 168 ft and for Type 3-5s the average is 165 ft. This seems to contradict the 170 ft SPTH used in the analysis. Is it assumed that the trees only grow 2 to 5 feet during the next 80 years of growth? The choice of the SPTH used to evaluate LWD recruitment potential makes a big difference in the percentages of potential recruited LWD by zone analyzed in the RDEIS (See **Figure 14**). For example, within the zone from 0-100 feet the 170 ft SPTH is projected to contribute just less than 75% of the LWD. For a SPTH of 225 feet less than 60% of the LWD is projected to come from the 0-100 ft zone. I could find little data on SPTHs at age 200 for the OESF. The North Fork Calawah Watershed Analysis Vegetation Module (Farrell 1999) states that SPTHs for riparian reserves for the majority of streams in the North Fork Calawah Watershed will range from 170 ft to 229 ft, with SPTHs of 211 feet being very common.



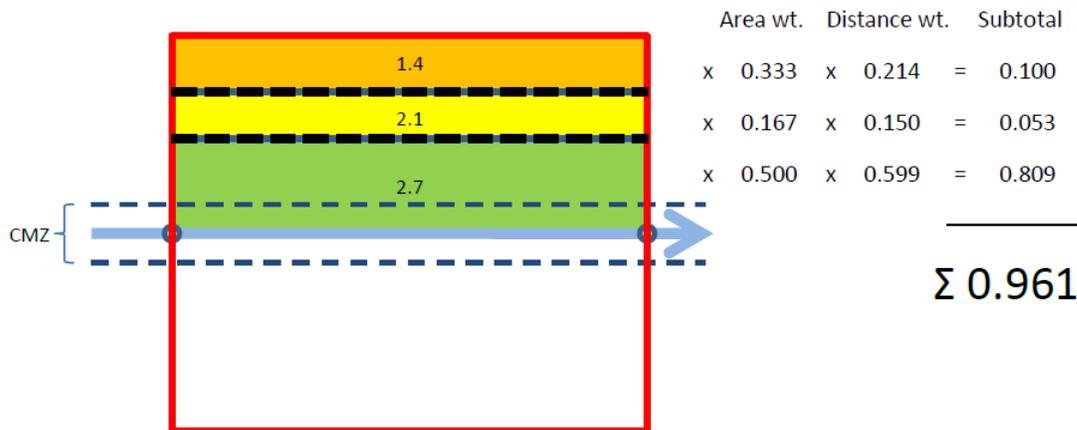
**Figure 14.** Comparison of LWD recruitment potential based on RDEIS model and varying site potential tree heights.

## Chapter 3 - Riparian Habitat

### *Preliminary area and distance weighted sum for entire reach-level analysis area (Figure G-8).*

From Appendix G-

c) Preliminary area and distance weighted sum for entire reach-level analysis area



The equations used in this step of the analysis are flawed. The first thing that should have been done was to determine the correct distance weighting for the zone of influence being examined. The distance weighting in the formula are for a total distance of 170 feet, but the zone being examined is only 150 feet. An example equation is included below.

$$DistWtZone150i = \frac{0.214}{0.963}$$

Applying the corrected distance weighting results in the following distance weights: Zone 150i = 0.222, Zone 100i = 0.156 and Zone 75i = 0.622. Now the sum of distance weights equals 1 and accounts for the relative contribution of each zone within 150ft.

At the reach scale if the areas within the three zones (75i, 100i, and 150i) are proportional to the predicted distance weighted zones there is no need to weight the area when determining the reach level potential score. The area weighting as done in RDEIS produces erroneous results that negate the validity of the entire riparian impact analysis. The correct weighting scheme for the example above is simple: potential value x distance weight (the sum for the three zone equals potential score). The distance weight already incorporates the proportion of LWD coming from the three zones (area). Consider the example above, now assume all potential scores are equal and the maximum potential score is 3 (see calculation below).

<u>ZONE</u>	<u>Potential</u>		<u>Area wt.</u>		<u>Distance wt</u>	<u>Subtotal</u>	<u>% of Pot.</u>
Zone 150i	3	x	0.333	x	0.214	= 0.214	18%
Zone 100i	3	x	0.167	x	0.15	= 0.075	6%
Zone 75i	3	x	0.50	x	0.599	= 0.900	76%

Sum=1.188

Here we know that the potential for each zone should be equivalent to the projected distance weighted LWD recruitment potential. Zone 100i is modeled to yield 15% of the recruited LWD yet the potential projected applying the weighted area method predicts only 6% of the potential is in zone 100i; thus underestimating the potential scoring weight by 150%. This method of analysis also over predicts potential score weighting for the 75i zone by 27%. Now apply corrected distance weighting and area weighting.

<u>ZONE</u>	<u>Potential</u>		<u>Area wt.</u>		<u>Distance wt</u>	<u>Subtotal</u>	<u>% of Pot.</u>
Zone 150i	3	x	1	x	0.222	= 0.666	22.2%
Zone 100i	3	x	1	x	0.156	= 0.468	15.6%
Zone 75i	3	x	1	x	0.622	= 1.866	62.2%

Sum=3

Now you can see that the sum of the calculation =3 which it should when considering potential for the zone of influence being analyzed. The sum =2.889 when the distance weighting is not corrected (2.889/3=96.3 the percent of riparian recruitment for 0-150ft for a 170ft SPTH).

The correct formula for reach level area weighting where non-proportional areas exist using the model logic in Appendix G is included below.

$$AreaWtZone150i = \frac{\left( \frac{Area75i + Area 100i + Area 150i}{Area 150i} \right)}{0.333}$$

$$AreaWtZone100i = \frac{\left( \frac{Area75i + Area 100i + Area 150i}{Area 100i} \right)}{0.167}$$

$$AreaWtZone75i = \frac{\left( \frac{Area75i + Area 100i + Area 150i}{Area 75i} \right)}{0.5}$$

These two errors are so significant that they undermine the entire riparian impact analysis which is fatally flawed and must be redone using the correct model. These comments apply to all portions of the assessment that use reach level scores and distance weight recruitment multiplied by area weighting (e.g., leaf litter impacts).

## **Chapter 3 - Riparian Habitat**

### ***Large Woody Debris Recruitment Potential Rating?***

The LWD recruitment potential ratings do not accurately represent the differences in potential. For example, a large, dense, conifer dominated stand is rated as having the same LWD recruitment potential as a medium, dense, mixed stand. The potential rating should differentiate potential scores more reasonably from 3 to 1. The desired future condition for most riparian areas is large, dense, conifer dominated stands. The potential of medium-size stands is not the same as for large-size stands (e.g., old forests).

The model allows trees from "medium-size" stands to be recruited from distances which exceed their height. This is caused by flaws in the logic used to build the model. The model uses a zone of influence represented by a theoretical 170 ft SPTH stand and then segments the zone by distance, and weights those zones based on the predicted potential of the 170 ft SPTH stand. For sub-mature and mixed stands, or potentially other stands the recruitment potential score is actual dependent on proximity. This is unaccounted for in this model. For example, a model stand with the following inventory data: WHDF (C), YQMD81=12 (M), YRD3DR1=63 (D), is converted to CMD with a potential rating = 3. This particular stand is only 100 feet tall (TOPHT=100). Within the zone from 100 to 150 feet it has a high recruitment potential (3) within the model. The actual potential should be 1 since it has no potential to be recruited (currently).

I looked at stand inventory data for the OESF and found each riparian stand that was classified as conifer, medium, and dense (CMD), these stands have a high potential score =3. I then calculated the average tree height for 1 inch quadratic mean diameter intervals. This shows that the average stand (polygon) height for CMD stands less than 15 inches (QMDBH) is 100 feet or less. The average for all CMD polygons is only 104 feet (average height is 106 ft when it is calculated based on weighted area). Two-thirds of the riparian stand polygons (61% by area) rated as having a high potential were classified as CMD, but 45% (by area) of stands classified as CMD were 100 feet tall or less. This applies to many more stand types across the OESF and should simply serve as an example of how the model is fatally flawed at evaluating recruitment potential (note problems with sensitivity ratings and the use of sensitivity ratings, as well as the problems with the potential score rating system are described above). The modeling solution is quite simple; determine the DFC potential and then compare to the current potential using a new model. Then manage the riparian area to maximize the potential relative to the DFC potential.

## Chapter 3 - Fish

### *What is the Status of Fish in the OESF*

The text within the main section of the document is somewhat misleading. The RDEIS states, *"Although the waters of the western Olympic Peninsula contain several federally listed and state sensitive populations of fish (refer to Appendix P), overall, this area maintains a greater proportion of robust fish populations than many other locations on the Pacific coast (Huntington and others 1996). Salmon and steelhead trout (including wild populations and those augmented by fish hatcheries) support thriving tribal and sport freshwater fisheries managed jointly by WDFW and western Washington tribes."*

This may be true for some portions of the Washington Coast but is definitely not true for populations/stocks from Lake Ozette north to the Waatch River around Cape Flattery and then East to Deep Creek. Within this portion of the OESF there are limited or no salmon and steelhead fisheries. Numerous stocks are characterized as having a depressed or critical status. This is partially captured within Appendix P but is not presented within the context of the main document. Appendix P lists 29 stocks (excluding those in the table listed as unspecified [spawn timing) within this portion of the OESF that are listed as having a status of critical or depressed.

Also within Appendix P, page P6 the document states, *"While individual salmon stocks are not eligible for listing under the Endangered Species Act, information on their status is available from a variety of source."* This statement is false. Individual stocks, if they compose an ESU are eligible for listing under the ESA. For example, Lake Ozette sockeye are a "stock", the entire ESU is composed of one stock, and the ESU is listed as threatened under the ESA.

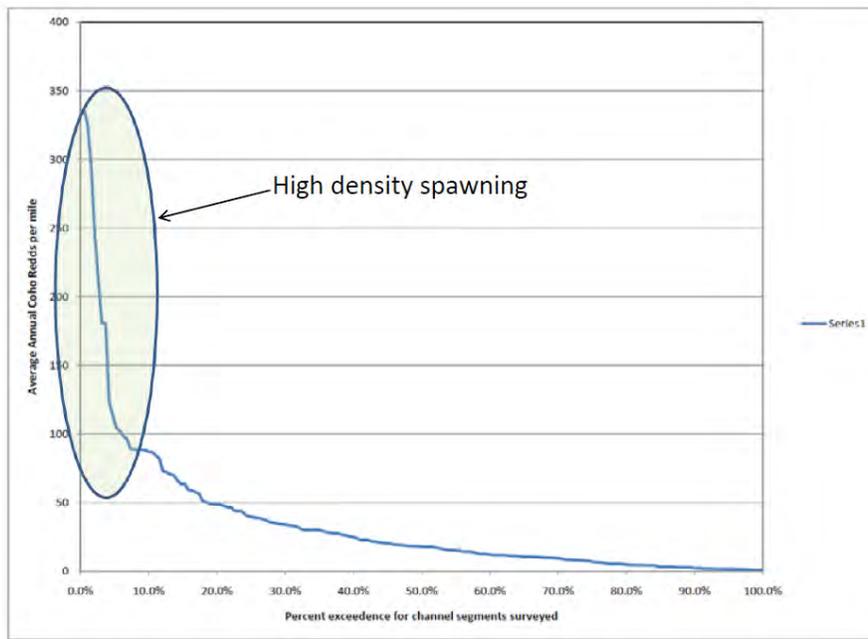
## Chapter 3 - Fish

### *What are the Indicators for Fish?*

The RDEIS states, *"Currently, DNR does not have, in a comprehensive or readily usable form, in-stream data on fish presence and the utilization and quality of habitat such as the amount and distribution of large woody debris, the availability and composition of spawning gravel, discharge, stream temperature, and sedimentation (settling and accumulation of sediment on the stream bed) for all streams in the OESF. Therefore, DNR used surrogates to assess current and future conditions for each indicator. For example, as a surrogate for the number and size of logs in each stream reach,<sup>2</sup> DNR assesses the characteristics of the riparian forest and its potential to provide large woody debris to the stream channel."*

It is understandable that DNR does not have comprehensive data on fish distribution and habitat conditions throughout the OESF. The RDEIS uses one complex model, after complex model with little if any actual data to justify the adequacy of forest management activities. Forest management activities contained within the RDEIS should be based, at least in part, on fish distribution, status of stocks within a WAU, and habitat conditions. Furthermore, very highly productive stream reaches should not be treated with the same management prescriptions as less productive or non productive stream reaches. Not all habitats are equal. Risk from timber

harvest to riparian stands should not be equal across all habitats. None of these concepts were incorporated into the plan. It makes no sense to apply the same level of risk to all habitat types. Salmonid productivity throughout a WAU can be evaluated using multiple methods. For a species like coho salmon one surrogate for current productivity is spawning density (see **Figure 15**). For multispecies landscape scale approaches see Haggerty and NOLT (2011).



**Figure 15.** Western Strait of Juan de Fuca average annual coho spawning densities and cumulative percent exceedence for channel segments surveyed.

## Chapter 3 - Fish

### *Identify Essential Habitat*

This analysis is fatally flawed. DNR identifies essential habitat for non-ESA listed species as stated here- "*For Chinook and coho salmon and steelhead trout, DNR identifies essential habitat using published, peer-reviewed intrinsic potential models (refer to the next section for descriptions of these models)*".

This approach might be acceptable if the models were in fact complete and peer reviewed. The fact is the models used by DNR are neither complete nor peer reviewed. The phase I model was peer reviewed and it resulted in the next model iteration (Phase II). However, the model itself is still at least three years from being complete. The modeling study was never intended to be used in the fashion DNR is using it and it was never intended to replace already ground-truthed data. It is supposed to be used as a guide of where to undertake field work that may have not been conducted yet (Anonymous, personal communication, December 2013).

I have reviewed the model outputs and known species/life history uses of channel segments throughout the OESF and in my professional opinion the model for all species and life stages is

highly inaccurate and a major step backwards (e.g., Salmonscape data). I will focus my examples to DNR managed lands within the Clallam Landscape and coho summer rearing. The first example is a right bank tributary to Clallam River Segment 12 (Haggerty and Clallam County 2008). This stream is mapped on the DNR state land hydro layer as a Type 5. The lower 560 feet average 15% gradient and are modeled as fish habitat (FP water type). You can see in **Figure 16** that the lower 560 feet or so have riparian zones delineated (narrow gray lines within transparent green overlay). The rest of the entire zone delineated as "essential fish habitat" is high gradient and mapped and modeled as a Type 5 stream. Also note that the headwaters and a portion of the left bank riparian area are mapped as NSO Young Forest, but much of the forest was totally destroyed by windthrow following the harvest of Big Country Unit 4 (over 25 acres of greater than 50% canopy cover loss was measured for the mapped structural habitat [not included in this figure]). In my opinion this example points to a serious problem with the modeling in the OESF. The upper stream reach is a Type 5 stream in the water type model but is most certainly a Type 4 stream on the ground, yet it is classified as "essential fish habitat". Then there is mapped NSO habitat that only exists in a model! Combining structural habitat losses with young forest marginal habitat losses to the west it appears 45 acres of mapped habitat no longer exists in reality, only in the model.

The next example includes two left bank tributaries to Clallam River Segment 14 (**Figure 17**). Both are upstream of a barrier (**Figure 18**) that currently limits upstream migration of coho salmon (based on a one day field survey that could only find steelhead and cutthroat trout upstream of the barrier). The stream to the west has a poor connection with the mainstem, and is unlikely accessible based my field survey. Stream gradient averages 19%. The stream is mapped as a Type 4 stream in the DNR hydro layer. Modeled as non-fish habitat in Forest Practice hydro layer, yet the stream is classified as "essential coho summer rearing habitat". The stream to the east also has a poor connection to the mainstem with a gradient averaging 18%. The stream is mapped as a Type 4 stream in the DNR hydro layer and modeled as non-fish habitat in Forest Practice hydro layer. But the stream is also modeled and mapped as "essential coho summer rearing habitat".

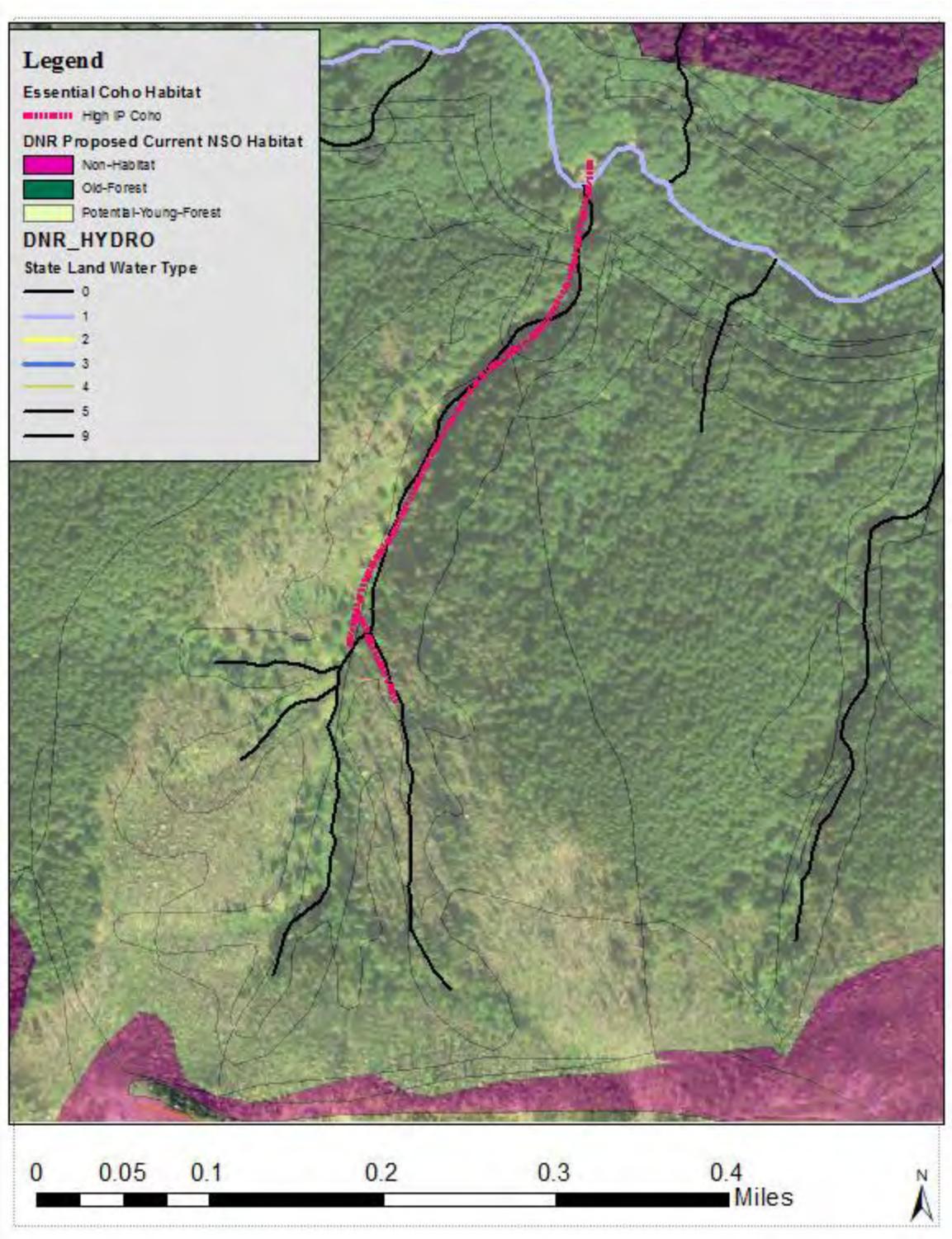
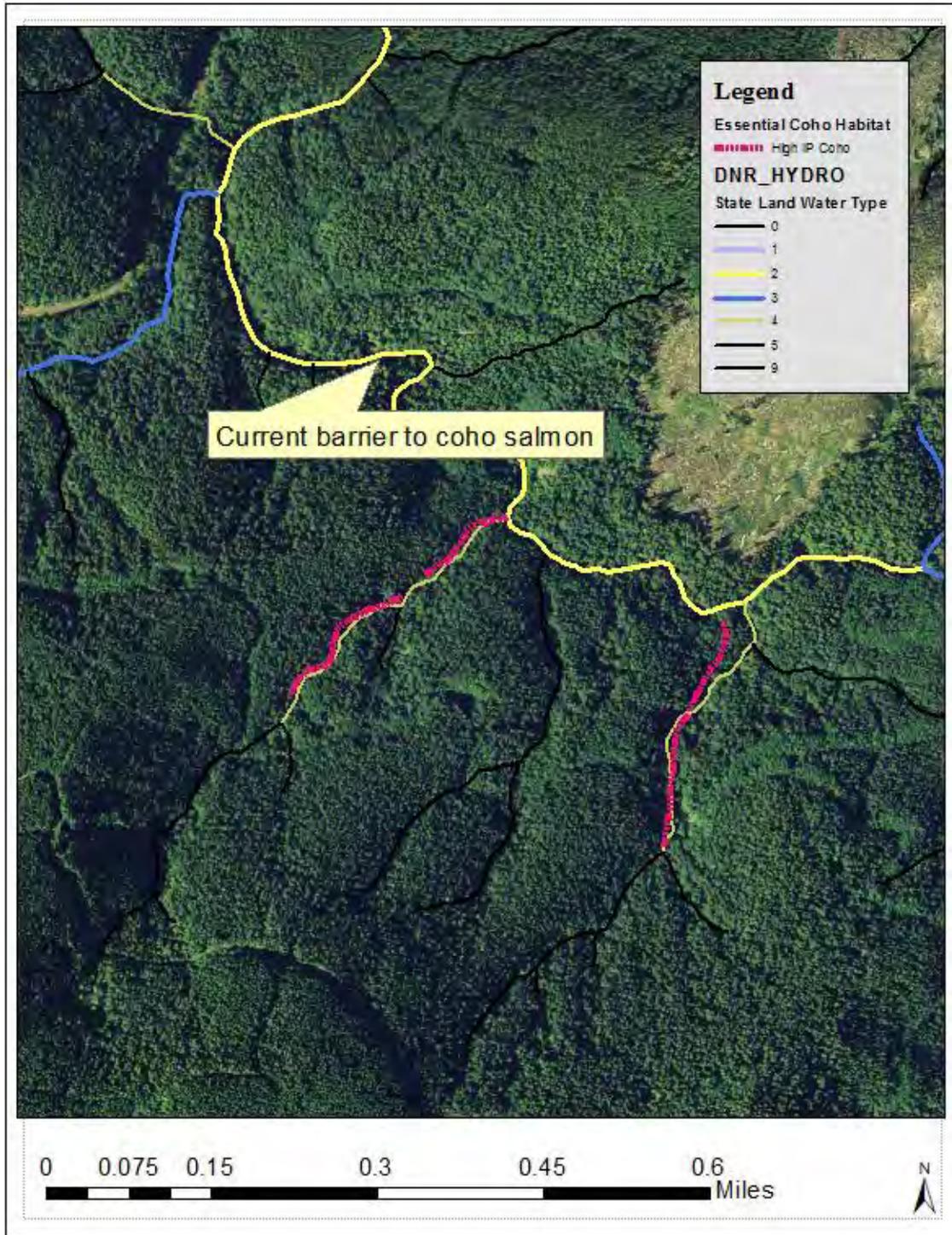


Figure 16. Right bank tributary to Clallam River Segment 12.



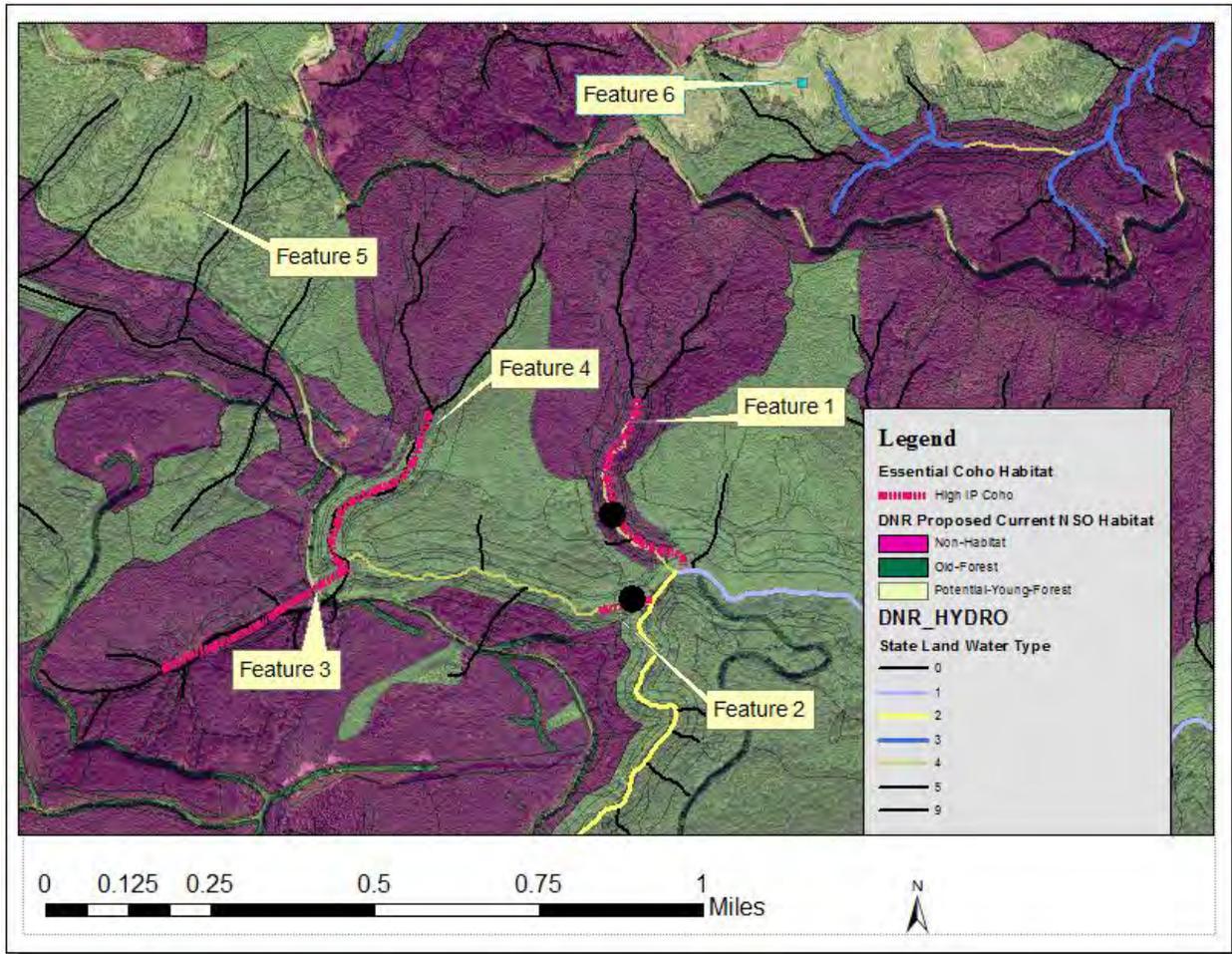
**Figure 17.** Two left bank tributaries to Clallam River Segment 12.



**Figure 18.** Valley spanning perched log jam in the mainstem Clallam River currently classified as a temporary barrier to coho salmon.

The next example is from an area around the Clallam River Segment 11/12 break (Haggerty and Clallam County 2008). This example includes numerous mapping and modeling errors. I will limit my comments to the six features and two waterfalls included in **Figure 19**. Feature 1 contains a few hundred feet of fairly steep (11%) habitat, then gradient picks up to 17%. There is an anadromous barrier within the "essential fish habitat" channel network. This stream is mapped as a Type 4 stream in the DNR hydro layer but modeled as fish habitat in Forest Practice hydro layer. Feature 2 was field surveyed and contains approximately 150 feet of good summer coho rearing habitat that is downstream of a waterfall approximately 30 feet tall. Features 3 and 4 are mapped as essential fish habitat but are upstream of the fish barrier described for Feature 2. Features 5 and 6 are included in this discussion based on their proximity to the other features described. Feature 5 is mapped as potential young forest. However, it was clearcut in 2012 and is not longer NSO habitat (Ridges Cleanup). Feature 6 is mapped as potential young forest but was clearcut in 2008 (P-1600 Blew Again). Features 5 and 6 provide additional examples of the differences between the modeled world and the real world.

I could provide endless examples of problems with mapped "essential habitat" for coho salmon summer rearing. However, it might be easier to show the erroneous nature of the "essential fish habitat" modeling by comparing the modeled output to DNR's water type layer (which is also full of errors). Within the OESF only 21% of the "essential habitat" for coho is classified as Type 1, 2, or 3 waters and 79% is classified as Type 4, 5, or unknown. Type 5 waters had the greatest length of channel classified as "essential fish habitat".



**Figure 19.** Map of Clallam River and tributaries near the Segment 11/12 break. Note large black dots are impassable waterfalls.

Within the Clallam River WAU not a single stream segment (not including a 150 ft portion within a segment) was identified as essential fish habitat where the gradient was less than 4% (the upper end of preferred habitat range; based on a comparison to SSHIAP and LiDAR data). Within the Clallam River Watershed 77% of the high IP summer rearing coho habitat was also mapped as Type 4 or 5. At the reach scale 3%, 79%, and 18% of reaches had gradient classes of 4-8%, 8-20%, and >20% respectively.

The IP model used is incomplete and not peer reviewed nor intended for the application for which it was used. The model assumes high IP scores for the highest gradient channels (less than 20% gradient), often above anadromous barriers. If the authors of the RDEIS had compared the model outputs with known facts about the life history of coho salmon they would have found that the modeled outputs were highly erroneous. The literature shows that summer rearing preference is typically below 3% (Reeves et al. 1989) but occasionally up to 5% (Agrawal et al. 2005. Burnett et al. (2007) which is cited in the RDEIS states that the index curve for coho salmon declines linearly from 0% gradient and assumes no use upstream of reaches with gradients exceeding 7%. In conclusion, for coho summer rearing the essential fish habitat

modeling did an excellent job identifying areas not used by coho salmon and did a terrible job identifying coho summer rearing habitat.

## Chapter 3 - Fish

### *Concluding Remarks On Fish Section*

Based on the fact that the "Essential Fish Habitat" subsection is fatally flawed I only skimmed through the rest of this section. One thing I noticed were multiple instances of inaccurately cited literature, direct falsehoods, and plagiarism. I did not have the time to search the entire document for un-cited references and plagiarism, I spent about 20 minutes and this is what I found.

*"Coho salmon are highly migratory at each stage of their lives and are dependent on high quality spawning, rearing, and migration habitat." Un-cited text in the RDEIS.*

**"Coho salmon are highly migratory at each stage of their life and are dependent on high-quality spawning, rearing, and migration habitat"(PFMC 1999).**

-----  
*"Soon after emergence in spring, fry (recently hatched fish) move from spawning areas to rearing areas." Un-cited text in the RDEIS.*

**"Soon after emergence in spring, fry move from spawning areas to rearing areas" (PFMC 1999)**

-----  
*"During summer rearing, the highest juvenile coho salmon densities tend to occur in areas with abundant prey and structural habitat elements (such as large woody debris and associated pools)." Un-cited text in the RDEIS.*

**"During summer rearing, the highest juvenile coho densities tend to occur in areas with abundant prey (e.g., drifting aquatic invertebrates and terrestrial insects that fall into the water) and structural habitat elements (e.g., large woody debris and associated pools)" (PFMC 1999).**

-----  
*"Coastal streams, wetlands, lakes, sloughs, estuaries, and tributaries to large rivers can all provide coho rearing habitat." Un-cited text in the RDEIS.*

**"Coastal streams, wetlands, lakes, sloughs, tributaries, estuaries, and tributaries to large rivers can all provide coho rearing habitat" (PFMC 1999).**

-----  
*"Beaver ponds and large slackwater areas can provide some of the best rearing areas for juvenile coho (Bustard and Narver 1975, Nickelson and others 1992, as cited in PFMC 1999)". DNR copied and pasted this text, this should be in quotes and is not properly cited.*

**"Beaver ponds and large slackwater areas can provide some of the best rearing areas for juvenile coho (Bustard and Narver 1975, Nickelson et al. 1992)" PFMC 1999.**

-----  
DNR includes the entire paragraph below without citing a reference.

*"Lake Ozette sockeye were listed as a threatened species under the Endangered Species Act in 1999 (64 FR 14528). The listing was primarily attributed to concerns over abundance and the effects of small population genetic and demographic variability. There are five known subpopulations or aggregations of Lake Ozette sockeye, defined in terms of where they spawn—on beaches around the lake or in tributaries. Beach spawning subpopulations include Olsen's Beach and Allen's Beach, while tributary spawning subpopulations include Umbrella Creek, Big River, and Crooked Creek." Un-cited text in the RDEIS.*

I wrote the paragraph below (NMFS 2009), parts were paraphrased other portions were directly copied and pasted without citing.

**"In 1999, Lake Ozette sockeye salmon were listed as a threatened species under the ESA (64 FR 14528, March 25, 1999). The listing was primarily attributed to concerns over abundance and effects of small population genetic and demographic variability. The Lake Ozette sockeye salmon ESU is made up of only one population (Currens et al. 2006), which currently contains five distinct spawning aggregations that are also described in this plan as subpopulations. The subpopulations can be grouped according to whether they spawn in tributaries (Umbrella Creek, Big River, and Crooked Creek) or near lake beaches (Olsen's Beach and Allen's Beach)." NMFS 1999.**

-----  
*"The non-anadromous, resident sockeye are called kokanee, and they are genetically different enough from anadromous Lake Ozette sockeye to be considered a separate evolutionarily significant unit." Un-cited text in the RDEIS.*

**"The non-anadromous, resident sockeye are called kokanee, and they are genetically different enough from anadromous Lake Ozette sockeye to be considered a separate ESU" (NMFS 2009).**

-----  
DNR INCLUDES THIS PARAGRAPH WITHOUT A CITATION

*"Lake Ozette, its perimeter shore, and most of the Ozette River, which forms the outlet of the lake to its estuary and the Pacific Ocean, are included in Olympic National Park". Un-cited text in the RDEIS.*

**"The lake, its perimeter shore, and most of the Ozette River, which forms the outlet of the lake to estuary and Pacific Ocean, are included in the 922,000-acre Olympic National Park (ONP). NFMS 2009"**

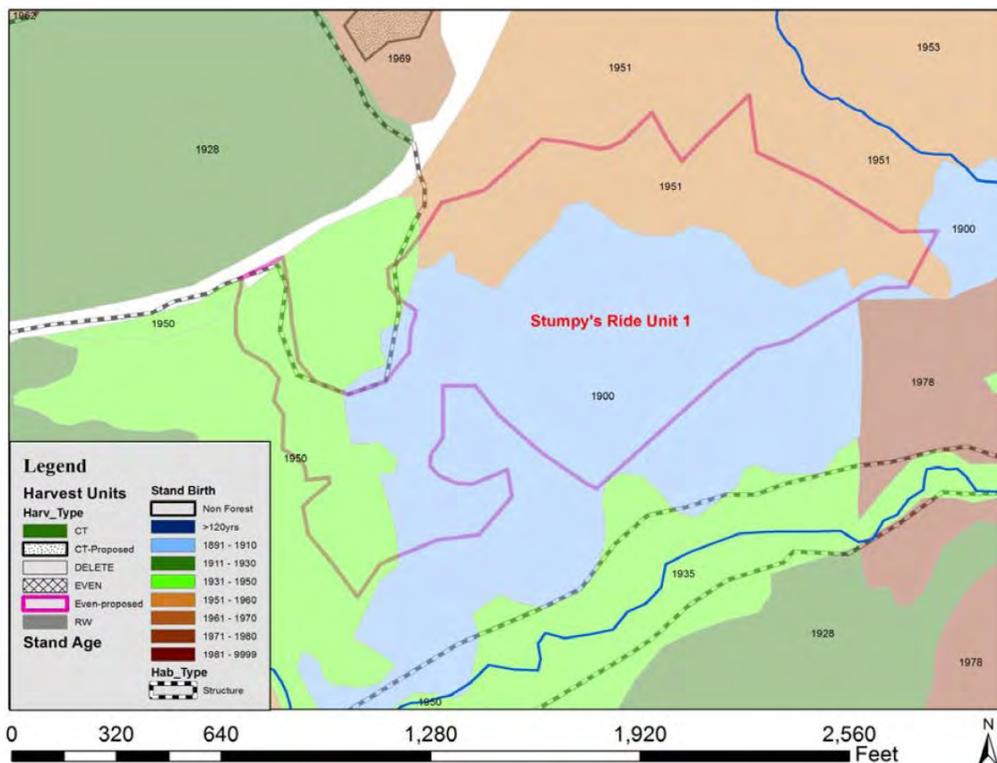
Un-cited text in the RDEIS.  
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If DNR is going to copy and paste from the literature they MUST: 1) include the text within quotes, 2) cite the source. If DNR is going to paraphrase text from the literature they MUST cite the source. In conclusion, the development of models which contain little real world data and the use and misapplication of models which yield erroneous results, coupled with numerous examples of inaccurately cited literature, direct falsehoods, and plagiarism make this portion of the RDEIS unacceptable.

## Addendum: Northern Spotted Owls

### *Indicator: Number of Acres of Modeled Northern Spotted Owl Habitat*

The Landscape Alternative proposes a new system to map and model NSO habitat in the OESF. Within the Clallam Landscape the proposed approach yields a significantly different old forest map (314 acres) compared to the current approach (0 acres). I reviewed several of the Old Forest polygons included in the proposed approach. One stand now classified as Old Forest caught my attention since I provided comments on this stand to DNR Division staff early this year. **Figure 20** includes a map of the stand (color light blue with stand birth 1900) and Stumpy's Ride Unit 1 (hollow polygon with pink borders).



**Figure 20.** Map depicting Stumpy's Ride Unit 1 and a stand of potential old forest (mapped blue with stand birth label 1900).

During the Final SEPA Determination (Feb 11, 2013; SEPA File No. 12-11202) DNR concluded that the stand was not structural habitat. Now DNR is mapping the stand as Old Forest. It is difficult to reconcile how two vastly different determinations can be made in a single year. It

appears that DNR on-the-ground management is based on modeled outputs versus on-the-ground conditions. This requires a tremendous amount of faith in "The Model" that often does not reflect current, on-the-ground conditions. For example, **Figure 21** below depicts several stands projected to be "Old Forest" in decade 6 of the Landscape Alternative that have been recently clearcut. I will describe each of the labeled features in the **Figure 21**.

Feature 1- This is Lambasted Unit 2 clearcut in 2008. Stand age 5 in the DNR stand inventory data used by the Estate Model. Projected to be Old Forest at Decade 6.

Feature 2-This is an unknown unit clearcut in 2001. Stand age 17 in the DNR stand inventory data used by the Estate Model. Projected to be Old Forest at Decade 6.

Feature 3- This is Ridges Clean Up clearcut in 2012. Stand age is 76 in the DNR stand inventory data used by the Estate Model. Projected to be Old Forest at Decade 6.

Feature 4. This is P-1600 Blew Again clearcut in 2008. Stand Age is 89 in the DNR stand inventory data used by the Estate Model. Projected to be Old Forest at Decade 6.

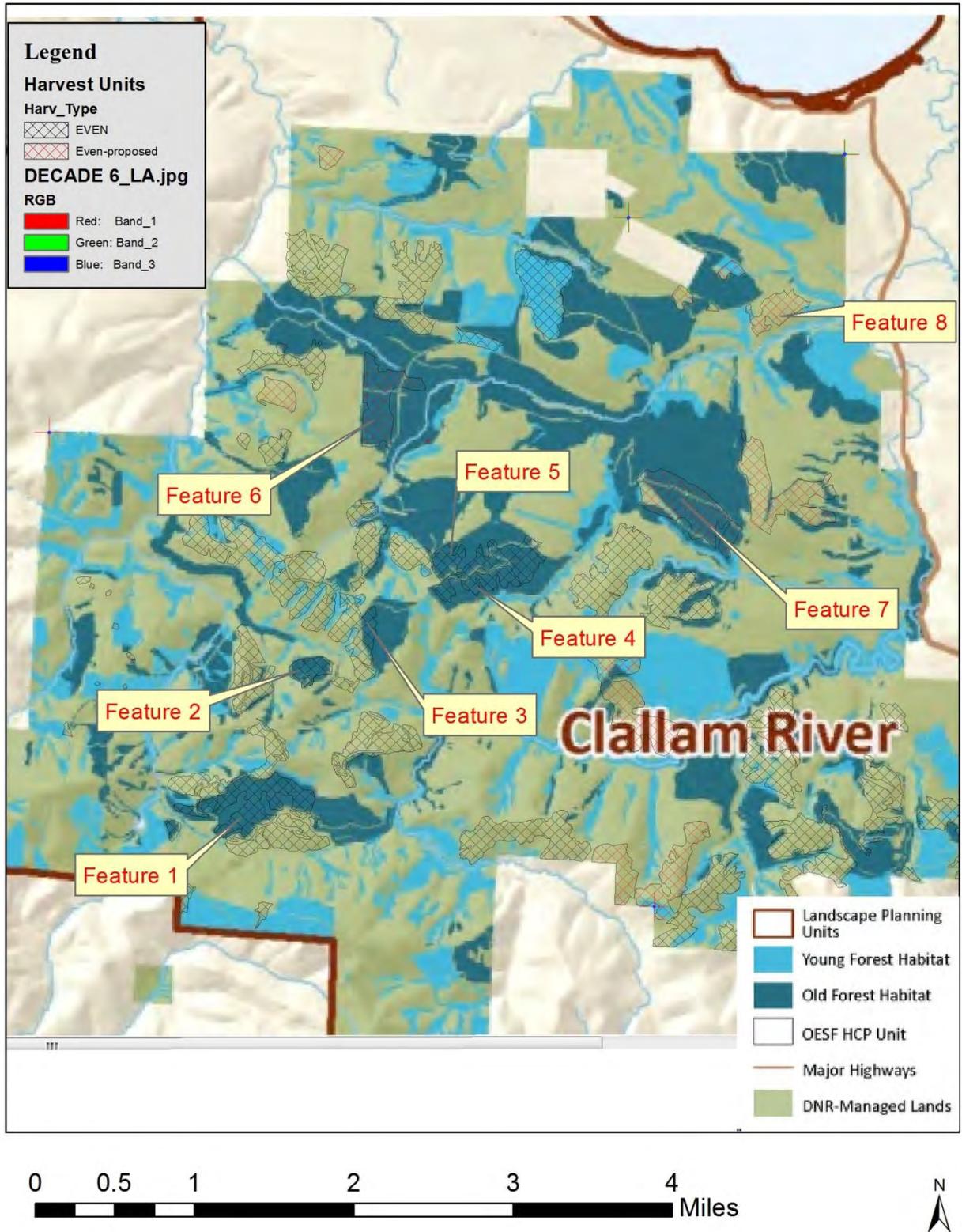
Feature 5. This is P-1600 Blow clearcut in 2007. Stand Age is 5-89 in the DNR stand inventory data used by the Estate Model. Projected to be Old Forest at Decade 6.

Feature 6. This is Stumpy's Ride Unit 5 to be clearcut in 2014. Stand Age is 45 in the DNR stand inventory data used by the Estate Model. Projected to be Old Forest at Decade 6.

Feature 7. This is Blowder Creek Unit 1 currently being clearcut. Stand age is 85 in the DNR stand inventory data used by the Estate Model. Projected to be Old Forest at Decade 6.

Feature 8. This is Stumpy's Ride Unit 1 to be clearcut in 2014. Proposed mapping classified as "Old Forest", stand age is 107 in the DNR stand inventory data used by the Estate Model. Projected to be non-habitat in Decade 1 and 6.

Based on reviewing this portion of the Clallam Landscape I estimate that roughly 9% of the projected "Old Forest" in Decade 6 will be between 60 and 70 years old (estimate includes stands which have experienced greater than 50% canopy loss from windthrow). There is a serious problem with the modeling of future "Old Forest" conditions based on current stand conditions. I do not have all of the information needed to determine the factors that are producing the erroneous "Old Forest" classifications predicted at decade 6. The modeling work needs to be redone in order accurately predict future "Old Forest" conditions.



**Figure 21.** RDEIS map of NSO Habitat Landscape Alternative at decade 6 contrasted with even-age harvest units (from 1997-2013) within a portion of the Clallam LPU (source: harvest unit boundaries come from unpublished mapping work I conducted for OFCO).

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## Sustainable Harvest Levels

Miguel Perez Gibson

The RDEIS states that the current sustainable harvest level is not being changed. The harvest level is a policy level decision that will be determined by the Board. However, the harvest level analyzed for both alternatives represents a harvest level that is higher than the current sustainable harvest level of 576 million board feet per decade.

Given the current harvest level, 576 million board feet per decade is the current policy, we question modeling that does not adhere to current policy.

The RDEIS states that even though the current harvest level policy was not modeled, there is no intention to harvest at a higher level than existing policy.

**We assert that a planning process that does not adhere to current policy needs to be approved by the policy-making entity, the Board of Natural Resources.**

The Landscape alternative appears to have more disturbance impact as a result of having a higher rate of harvest than existing policy

The Landscape alternative has a larger harvest footprint 2,373 acres than the no action alternative. The area of disturbance is being increased.

There are more forest stand entries than the no action alternative, 12,000 acres are scheduled to receive three or more forest stand entries than under no action, and more than current policy.

The charts show a difference in Variable Retention Harvest (stand replacement harvest-clear-cut) of an additional 3 thousand acres in the first decade.

In terms of Volume, it appears that within the first decade the no-action alternative has a harvest level of around 65 MMBF/year, and the Landscape plan has a harvest level of close to 80 MMBF/year.

Given the current policy has a level 57 MMBF/year; we question the validity of a plan that departs significantly from current policy. There appears to be an assumption that the next harvest calculation will be increased. **We argue that this is a decision that needs Board of Natural Resources approval.**

# **Analysis of Adaptive Management**

Derek Poon

## **DISCLAIMER:**

The findings and conclusions in this analysis are those of the author and do not necessarily represent the views of the Olympia Forest Coalition (OFCO); any OFCO reviewer; or any agency, organization, or individual.

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## **PROLOGUE AND SUMMARY:**

### **PROLOGUE:**

I am pleased to have been asked by the Olympic Forest Coalition (OFCO) to submit my independent analysis of the Adaptive Management (AM) process presented by the Washington Department of Natural Resources (DNR) in their Revised Draft Environmental Statement (RDEIS; WDNR, 2013) on the Olympic Experimental State Forest (OESF) Forest Land Plan (WDNR, 2013, Appendix A) released for a 45-day review, with final comments due December 16, 2013.

I read relevant parts of the RDEIS; conducted independent analysis; spoke to several OFCO subject reviewers and read two subject reports. I concluded that DNR did an admirable and

candid AM assessment, with much of which I agreed. I also had some conclusions different from DNR, and those are addressed herein. Differences I found with DNR were all reconcilable, albeit challenging, and the concepts of AM and associated ESA Habitat Conservation Plans (HCP; WDNR, 1997) and Recovery Plans (USFWS, 1997) are not challenged.

## **SUMMARY:**

Adaptive Management (AM) is a tool to help maintain program development towards program goals. I used Endangered Species Act (ESA) listed species to evaluate AM efficacy in the OESF RDEIS -- primarily focused on the Marbled Murrelet (MM) -- and found that OESF AM, while realistically described by DNR, did not meet Department of Interior (DOI) AM guidelines, contrary to DNR findings using the same evaluation source (Williams and Brown, 2012; Williams et al., 2009). However, the DNR AM process is making progress and will likely be even more effective given management and user support, and adequate incentives. DNR inadequacies are not unusual given AM experienced broadly, and are all fixable.

AM helps to achieve the OESF goals of environmental protection, indicated by a path to recovery and delisting of ESA listed species; and fiscal accountability, indicated by timber harvest to help fund schools. The major AM question with all-consuming influence is whether these goals are co-equals as purported by conservationists, or fiscal responsibility is a higher priority, as asserted by DNR through policies, actions, and litigation history. Without resolution, AM is confounded.

I believe OFCO will work with DNR to effectuate AM and help reach these goals as much as practicable by

- (A) finding and applying incentives of money, regulatory flexibility, and recognition to supplement regulations;
- (B) applying the ESA recovery principle of “Not Everything Everywhere All The Time” (NEEATT) to identify timber harvests consistent with ESA species recovery;
- (C) completing certain data or protocol reconciliation and HCP Marbled Murrelet (MM) documents necessary for AM and HCP efficacy; and
- (D) completing a Marbled Murrelet (MM) Recovery Plan (USFWS, 1997) that currently relies on an incomplete MM HCP (WDNR, 1997) with an MM Interim Management Strategy.

The incomplete HCP information in (C) consists of

- (a) the MM Long Term Conservation Strategy (LTCS) missing from the MM Recovery Plan and HCP;
- (b) updated or new HCP “minimization and mitigation” for all ESA listed species.

This missing information frustrates and confounds AM, harvest planning and species recovery, and deserve focused attention.

## 1.0) BACKGROUND

AM is a management tool that has been meticulously studied and recognized as the preferred method using a learning by doing approach to maintain project directions toward defined goals (e.g., Lee, 1999; Walters, 1997; Walters and Holling, 1990; cf. 2010 Conservationists' comments on OESF DEIS). Every project that needs mid-course adjustments must use AM in some form.

The Federal Services in charge of ESA (USFWS, NOAA) recognized that AM enhanced species protection and specifically required AM (as one of the basic five requirements; see p.8) in all HCPs. DNR explicitly agreed to using AM in the OESF HCP Implementation Agreement (IA; WSDNR, 1997), and AM was commendable analyzed in the 2008 DNR Science Team Report (Raphael et al., 2008) and in the RDEIS (WDNR, 2013) Appendix A, Chapter 4 .

The US Department of Interior (DOI) thoroughly vetted AM and published AM application standards and guidance for AM users (Williams and Brown, 2012 – “Application Guide”; Williams et al., 2009 – “Technical Guide”). From the 2012 Application Guide, DNR used a five-considerations analysis to determine whether AM selection is prudent (RDEIS Appendix A, p. 138; Williams and Brown, 2012). I used a different analysis of AM selection from the 2009 Technical Guide (Williams et al., 2009): a “nine-questions” analysis called a “Problem-Scoping Key for AM” (Appendix A) to evaluate whether AM is an appropriate application. I also used DOI’s criterion of SMART<sup>1</sup> objectives (Appendix B; Williams et al., 2009) to attain goals and avoid program failures. These approaches are discussed under 2.0 Analysis.

### 1.1) Adaptive Management (AM) in OESF

What is adaptive management? Simply stated, AM is how we achieve goals. For OESF, AM can be effectively applied, but it faces challenges characteristic of forest management.

First, how does AM work? An example is this. If we are trying to go from point A to point B (the goal), say a trip from Seattle to New York, we make necessary corrections, or adaptive managements, to stay on course to New York. If we didn’t know what the destination B is, any road will take us there. If we do know B is New York, not Florida or Alaska, we can make educated course adjustments if we wandered off course.

When AM is applied to OESF, it is to maintain forest management toward stated goals, making mid-course adjustments when necessary. However, complications made AM application problematic.

#### **Opposing and implicit views**

AM implementation for natural resource management is very difficult because inherent and opposing socio-economic views frequently confound efforts to reach goals. Moreover, such

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<sup>1</sup> SMART = Specific, Measurable, Achievable, Results-oriented, and Time-fixed; see Appendix B.

differences are frequently implicit rather than explicit, and are not openly debated. These difficulties made AM contrary rather than cooperative and resulted in very few successful AM natural resource management applications relative to all the projects that must rely on AM for successful implementation (Lee, 1999; Walters and Holling, 1990; Wilhere, 2009).

To be fair, AM is usually successful when goals are not debated or not monetarily controversial, such as medical procedure improvements, disease diagnosis, facility construction, or aid in natural disasters. AM, however, is controversial whenever project goals are contentious, such as in forest management.

DNR articulated a candid AM analysis in the RDEIS (WDNR, 2013, App A, Chapter 4) and recognized that AM implementation is trouble prone with limiting factors that are more socio-economic than technical; thus there are very few success, citing a success in British Columbia and a trouble-prone example in the Northwest Forest Plan. In my own experience, I had great positive AM experiences when I was the decision maker, but I too met with difficulties when I accounted to diverse user views.

In a significant revelation, I found it very commendable that the DNR RDEIS (WDNR, 2013, App A, Chapter 4) acknowledged that while **AM** is the preferred method, forest management must also use the **Precautionary and Trial and Error** approaches; this is particularly realistic when long term strategies either do not exist or are judged with explicit or implicit diverse goals. In the example I used above, this situation is like trying to be the trip navigator when the passengers want to go to New York and Alaska at the same time; worse yet, passengers may not even know the destination.

## **Two additional examples**

In addition to DNR's two AM examples, two further examples in Washington State illustrated AM implementation challenges directly relevant to DNR and OESF, based on fundamentally different implicit goals.

The first was prominently touted as the most scientifically-credible AM in the country in the WA Forest and Fish (F&F) AM Program, which was used to manage an affirmation of the "Clean Water Act (CWA) Assurance" to keep forest management on a path to CWA and ESA compliance based on a ten-year science-guided and inclusive (governments, Tribes, industry, and citizens) research, monitoring, and evaluation (RME) process. The CWA Assurance was a fundamental part of a HCP that was one of the largest in the nation. In 2008, the WA Department of Ecology regrettably concluded that CWA Assurance could not be validated after ten years of science- and user-guided monitoring. (WSDE, 2009)

The second WA example was the Yakima Resource Management Cooperative (YRMC) forest harvest management in the Taneum Basin in Washington, based on agreed-to forest harvest goals and contingencies (alternatives or plan Bs) between industry, Tribes, and conservationists. YRMC collapsed in 1995 when industry concluded that agreement was voluntary and not mandatory, and did not implement contingencies after monitoring revealed contingencies were

justified. (Personal communication, Marcy J. Golde, Washington Environmental Council, April 7, 2012)

In both cases, goals were different where conservationists explicitly wanted co-equal environmental protection and timber harvest benefits, and industry implicitly placed a higher priority on harvest benefits over environmental protection.

Because implicit goals differed, I concluded that these two WA AM denouements were not unexpected and in fact were predictable. I don't fault industry for profits, which are why they are in business. As proffered in my discussion and recommendations below (4.0), this implicit difference can be turned into a win-win with certain conciliatory actions.

## 1.2) Goals direct AM

AM analysis is not just for the AM process independently, but the interactions between AM and the goals it must help achieve. Indeed, **goals define how AM will be done.**

Why are goals so crucial to AM success? The reason is that goals, and primarily implicit socio-economic goals, pervade and control virtually all management and policy choices, including AM. And by corollary, AM encompasses all the program choices (Williams and Brown, 2012; Williams et al., 2009; Appendix A).

Unless diverse implicit and explicit goals are openly debated, addressed without prejudice, and reconciliation found, AM implementation is problematic and usually confounded or compromised, resulting in gridlocks and impasses.

We can address any program actions such as project implementation or completion; funding priorities; staff qualification and selection; RME; or science implications; policy choices are still fundamentally and frequently based on implicit socio-economic goals rather than environmental regulations or even budgets; it all depends on policy choices. To be fair, implicit goals could be the same as explicit goals, but that usually is not true in forest management because many want to keep hidden agendas hidden. To their credit, DNR acknowledged that socio-economics will affect science finding in AM decision making (WDNR, 2013, App A, Chapter 4).

OFCO articulated co-equal goals of environmental protection and fiscal responsibility. DNR, by its funding priorities, harvest decisions, and litigation history, implicitly considered fiscal responsibility a higher priority than environmental protection, and explicitly stated so. In a 2013 example, when questioned why the best available science in the 2008 DNR Science Team Report (Raphael et al, 2008) was not made one OESF alternative in the RDEIS, DNR stated that the Report did not give adequate consideration to fiscal responsibility<sup>2</sup>. As another example, the recent USFWS-approved DNR "minor amendment" to harvest timber in SW Washington, which resulted in a court decision against DNR, was based on DNR's preference for fiduciary responsibility over environmental protection.

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<sup>2</sup> Derek Poon question to DNR at the June 10, 2013 DNR Sedro Woolley OESF scoping meeting.

Without explicit and implicit agreement of these co-equal goals, no amount of adjustments will materially affect harvest management decisions and AM. The issue isn't our ability to implement AM, but whether AM implementation is allowed to occur with conflicting goals. Or stated differently, we know how to protect the environment, but the limiting factors are socio-economic, not technical (Lackey, 2013; Lackey et al., 2006). I am not advocating one goal over another because both goals are important, and I believe both could be achieved co-equally.

### **1.3) ESA in AM analysis**

As stated in HCP IA in 1.0 Background, AM is required, not discretionary in HCPs. It therefore is relevant for DNR to first show that AM was properly selected and is working effectively to target project goals, before addressing how ESA is used as an AM indicator.

DNR used the five considerations method to determine that AM is a prudent policy choice to enhance ESA protection (WDNR, 2013, Chap 4, p. 138). As described in 2.0 Analysis below and 1.0 Background above, I also conducted this analysis using the nine-questions checklist key and the SMART Objectives descriptions from the same DOI sources (Appendices A and B) and concluded that AM is not an appropriate choice.

Beyond the question of being prudent or appropriate in picking AM, the AM analysis in 2.0 uses ESA listed OESF species as effectiveness indicators. There are physical, chemical or biological parameters that indexed habitat and ecosystem health, but ESA species are particularly conducive because they are biological and holistic indicators that encompassed physical and chemical ecosystem requirements necessary for long-term ESA species survival and recovery. So if AM is keeping program progress on track and ESA species are on a path to recovery and delisting, environmental protection must be occurring or else ESA species survival or growth would be static or declining.

Besides ESA, fiduciary responsibility could be an AM indicator as timber harvests are indices of economic health of timber counties, but timber harvest may or may not be consistent with ESA species recovery. Achieving co-equal fiduciary responsibility and environmental protection status will be discussed later in this analysis.

## **2.0) ANALYSIS**

### **Primarily on MM using abbreviated procedure**

I judged AM effectiveness based on the DOI checklist key in Appendix A, and SMART objectives in Appendix B. For each of four ESA listed OESF species – MM, Northern Spotted Owl (NSO), Bull Trout (BT), and Ozette Lake Sockeye Salmon (OSS) -- I assessed whether answers to nine questions in the checklist key are positive or negative, and whether SMART objectives are used; I then concluded whether AM is appropriate for that ESA species. I wanted to start with MM, an important OESF focus, and then assessed the other listed species. As it

turned out, time limits and other considerations forced me to primarily use MM, and extrapolate my findings to other listed species with less analysis. I also used an abbreviated procedure that allows analysis only on two questions.

The basis for **an abbreviated AM analysis** was that I only needed two questions since just one or more negative answers to the nine questions would make AM inappropriate for that species. The number of negative answers, however, would give an useful indication on the degree of remediation necessary to make AM an appropriate application; alternatively, if AM is not appropriate, another method such as precautionary or trial and error could be used. Given the need for quick analysis, I did not pursue answers for all nine questions.

## **DNR's five considerations or my nine questions checklist key?**

The DOI Application Guide (2012) provided important AM qualifications and case studies, and included the five considerations analysis DNR used to evaluate whether AM is prudent (WDNR, 2013, App. A, p. 138). My analytical method of the AM choice was the nine questions checklist key method in the 2009 DOI Technical Guide (Appendix A); the nine questions included the five considerations DNR used, but more critically, included a question (#9) on ESA compliance not found in DNR's five considerations method. The ESA compliance question was most cogent in an AM designed to evaluate just that, ESA compliance.

### **2.1) ESA-listed Marbled Murrelet**

I found two negative and incontrovertible answers to the nine checklist key questions for MM (Appendix A). The most obvious one was #9 on ESA compliance because the LTCS, required in the 1997 MM HCP and recognized as the missing roadmap to MM long term recovery in the MM Recovery Plan, is simply not done; therefore, answer to #9 had to be no. Moreover, since the missing LTCS is expected to provide explicit, site-specific, and measurable objectives, which also qualify as SMART objectives in Appendix B, DOI question #3 on explicit management objectives can only be answered no absent the LTCS.

9. Does the whole process fit within the appropriate legal framework?

(see Sections 2.3, 2.4, 3.2, 4.1, and 4.2)

No – adaptive management should not proceed absent full compliance with the relevant laws, regulations, and authorities.

Yes – all of the basic conditions are met, and adaptive management is appropriate for this problem.

3. Can management objective(s) be stated explicitly?

(see Sections 1.2, 2.1, 2.2, 2.3, 3.1, 4.2 and 5.1)

No – adaptive management is not possible if objectives are not identified.

Yes – go to step 4.

I found that the DNR MM Science Team (Raphael et al., 2008) assumed in 2008 that the MM LTCS would be completed before the Team's recommendations would be implemented in OESF. Moreover, the entire DOI checklist key (Appendix A) also implied that unless all nine

questions could be affirmatively answered, AM application is premature. Accordingly, my bottom line is that OESF AM is premature.

It could be argued that explicit management objectives can be stated without the MM LTCS because specific OESF habitat characteristics in the OESF Interim Strategy are the management objectives. This is a legitimate question and I answered in two steps, which must lead to future reconciliation between scientists and managers.

First, I listed the anticipated MM LTCS contents from the DNR Science Team Report (Raphael et al., 2008), to indicate what the LTCS is likely to provide finely detailed and customized information for each OESF planning unit, using an “unzoned” approach.

Second, I listed information for OESF objectives excerpted from HCP requirements, including DOI specified SMART objectives, and from the Recovery Plan, which each listed species is required to develop, even though Recovery Plan implementation is voluntary. In these excerpt, I highlighted provisions for objectives, indicating a high degree of required specificity that can only be developed in a LTCS design, and with substantial technical analyses.

## **DNR MM Science Team, HCP, and Recovery Plan objectives**

The DNR MM Science Team (Raphael et al, 2008) listed the expected MM LTCS contents as follows.

### **3.3 Conservation Approach for a Marbled Murrelet Long-Term Conservation Strategy in the Olympic Experimental State Forest**

The OESF Analysis Unit has unique conservation strategies as part of its mandate to learn how to achieve integration of old forest ecosystem functions with commercial forestry on state trust lands (DNR 1997a). **The management strategy of the OESF is that of an “unzoned forest” (i.e., land management decisions are guided by earth, biological, and other sciences) to achieve multiple objectives across 11 intermediate-scale landscape planning units (LPUs)** (Figure 3-14, Table 3-5).

The basic working hypothesis for the OESF is that DNR can conserve or restore old forest ecosystem functions by planning, applying, monitoring, and refining forest management activities at multiple spatial and temporal scales rather than working around constraints of administrative land allocations (Lindenmayer and Franklin 2002). Landscape-level analysis and planning are intended to set the spatial and temporal patterns for achieving conservation, revenue, and other objectives in each of the 11 LPUs. The OESF has unique conservation strategies for northern spotted owls and riparian ecosystems, and the HCP suggested unique marbled murrelet strategies for each planning unit (DNR 1997a). The nature and context of DNR lands in the OESF, as well as the OESF mission, suggest an “unzoned” approach to achieving biological goals for marbled murrelet conservation as well. The “unzoned” management approach was used as a guiding principal while the Science Team developed the OESF conservation objectives.

An effective unzoned approach to marbled murrelet conservation should consider the biological goals of a stable or increasing population size, increasing geographic distribution, and increased resilience to disturbances, in the context of other OESF objectives, and the OESF's patterns of land cover, ownership, and forest zones.

According to the USFWS (<http://www.fws.gov/endangered/esa-library/pdf/hcp.pdf>), **HCPs** are required to comply with the Five Points Policy, and point #1 addressed goals and objectives:

1. **biological goals and objectives, which define the expected biological outcome for each species covered by the HCP;**
2. adaptive management, which includes methods for addressing uncertainty and also monitoring and feedback to biological goals and objectives;
3. monitoring for compliance, effectiveness, and effects;
4. permit duration which is determined by the time-span of the project and designed to provide the time needed to achieve biological goals and address biological uncertainty; and
5. public participation according to the National Environmental Policy Act.

ESA **recovery plans** for which the HCP is designated as the tool leading to recovery and delisting of listed species, have the following specifications.

(<http://www.fws.gov/cno/es/recovery.html>)

The development of a recovery plan is one of the first steps for species recovery and is a tool to guide the recovery process and measure progress towards recovery. The U.S. Fish and Wildlife Service is required under section 4(f)(1) of the Endangered Species Act (ESA) to prepare recovery plans for newly listed species, unless we determine that **such a plan will not promote the conservation of the species. Recovery plans serve as road maps for species recovery - they lay out where we need to go and how best to get there.** Recovery plans are guidance documents; not regulatory documents.

(<http://www.nmfs.noaa.gov/pr/recovery/>)

Recovery plans must incorporate, at a minimum:

1. **A description of site-specific management actions necessary to achieve recovery of the species,**
2. **Objective, measurable criteria which, when met, would result in a determination that the species be removed from the list;** and
3. Estimates of the time and costs required to achieve the plan's goal

The DOI specified the following **SMART provisions for AM objectives required in HCPs.**

(<http://www.doi.gov/ppa/upload/TechGuide.pdf>)

In the context of adaptive management, objectives must be relevant to the decision making process and possess a number of attributes that render them useful as guides to management. To be useful for decision making and evaluation, objectives need to exhibit the following technical features:

• **Specific:**

Objectives should be unambiguous, with specific metrics and specific target conditions. Specificity can be

encouraged by articulating objectives with Who, What, Why, and/or Where phrases.

- **Measurable:**

Objectives should contain elements that can be readily measured, so as to promote the evaluation of management actions and recognize their contributions to successful management.

- **Achievable:**

Objectives should be based on the capacities of the natural resource system being managed and the political or social system within which management occurs.

- **Results-oriented:**

Objectives should contain for resource endpoints and/or conditions representing their achievement. For example, a results-oriented habitat objective might describe the habitat conditions expected when the objective is achieved.

- **Time-fixed:**

Objectives should indicate the timeframe for achievement, consistent with the duration of the project. Project implementation may be in stages, but the overall timeframe should be clear.

Of these HCP, Recovery Plan, and AM specifications, the most difficult ones to meet without a LTCS is the Recovery “minimum” contents of “**A description of site-specific management actions necessary to achieve recovery of the species; and Objective, measurable criteria which, when met, would result in a determination that the species be removed from the list.**” These questions are directed at recovery or delisting, which go beyond HCP-required minimization and mitigation. I believe such considerations would most certainly be extended off site and off OESF, resulting in possible site-specific and potentially unique prescriptions. Moreover, any site-specific regulation should include vetting of the “Not Everything Everywhere All The Time” (NEEATT) ESA recovery concept, as well as use of incentives of money, regulatory flexibility, and recognition, which are by necessity species-wide and not limited to specific sites or even to just OESF; I recognize, however, that the “no zoning” approach of the Science Team could still prevail limiting ESA effects to individual sites; however, absent a completed and approved MM LTCS, I can’t even begin to analyze off-site ESA considerations. At the minimum, I submit these Recovery questions should be vetted.

## **HCP versus Recovery Plan**

One significant consideration, or difference, of comparing HCP versus Recovery Plan is that the HCP required in OESF may or may not equal to species recovery or delisting. HCP can be but may not be equal to a Recovery Plan because recovery is not required for a HCP, which is only required to “make a contribution” to recovery. In the Recovery Plan, even though implementation is voluntary, **the Plan itself is required** and must provide a road map to recovery and delisting **for each listed species**. With vetting, any difference between HCP “contribution” and actual recovery and delisting is probably reconcilable, but that prospect remains to be seen since a completed MM Recovery Plan is still pending with an incomplete

**MM HCP. What is certain is that existing OESF information will not meet Recovery, HCP, and SMART specifications without the LTCS.**

## **2.2) Other ESA-listed species**

The MM analysis should be applied to other listed species of NSO, BT, and OSS. Based on limited review time, and the obvious precaution that I, as an AM reviewer, should not get into species review except as needed to verify AM efficacy, I limited my species review to consultations with OFCO species experts, and ask readers to consult with other OFCO reviews for details.

I did ask OFCO species experts on such topics as species status, riparian protection, RME, stream typing, on-the-ground data accuracy and interpretations, surveys, and timber harvest predictions. Based on these consultations, I can safely conclude, even without thorough vetting, that substantial and scientifically-defensible differences exist in HCP-required minimization and mitigation to protect listed species, requiring protocol and data updates and reconciliation, and confounding or compromising any attempts to interpret effects of management actions on ESA species. For example, just a simple analysis of riparian protection afforded to ESA species by different stream types could have diverse interpretations that are magnitudes, not small percentages, in differences. Such a result is cause for a formal HCP amendment.

Since I already concluded that AM is not, at this time, an appropriate choice for MM, with the default to precautionary or trial-and-error approaches, it is possible but highly unlikely that AM could be judged an appropriate choice for other listed species given the obvious and still unreconciled differences in interpretation of HCP-required minimization and mitigation. Therefore, while AM is inappropriate for the four listed OESF species in different ways and probably at different degrees, given AM is definitely not appropriate for MM, AM is probably of questionable status with the other listed ESA species.

## **3.0) CONCLUSIONS**

In comments submitted on the 2010 DNR DEIS preceding this 2013 DEIS, conservations articulated their reasons why successful OESF AM is highly unlikely. While DNR made significant progress between 2010 and 2013, that same “highly unlikely” conclusion remains today.

Even with a focus on MM, based on my ESA analysis, I opine it is not deniable that AM is not appropriate for OESF. However, I credit DNR with substantial efforts to satisfy regulations while working with diverse user interests, practically a no-win situation. Moreover, it is also important to know that OFCO is happy to help DNR with actions necessary to make AM appropriate for OESF, which is to answer positively to all nine DOI questions in Appendix A. The following discussion and recommendation will elaborate.

## **4.0) DISCUSSION AND RECOMMENDATIONS**

While the above conclusion is that AM is not possible (highly unlikely) for OESF, the take home message is a positive one – AM can be effective with adjustments entirely possible with collaborative user support.

I indicated the importance of applying NEEATT and incentives of money, regulatory flexibility, and recognition to help make species recovery palatable and economically beneficial for affected users. I believe that with efforts, timber harvests consistent with species recovery could be located to benefit industry and the local economies.

I started by examining how goals will direct AM, but it is just as important to recognize that AM goals should satisfy the legal requirement for the species to recover, not just to contribute to recovery or to just survive. This means Recovery Plan principles, which specified recovery, and not HCP requirements alone (negotiated minimization and mitigation that are only required to contribute to recovery) must guide planning and implementation.

I recognize the Recovery Plans have voluntary and not required implementation. However Recovery Plans are required for each ESA listed species, so at a minimum, species recovery must be articulated, even if implementation is politically affected. And for the MM Recovery Plan, which is now final without a MM LTCS, I submit that final and approved are not the same as a missing roadmap to delisting.

I respect DNR's requirement for timber harvest and fiduciary responsibility, since pragmatically, economics are important to industry and to help fund county schools. As a legal matter, unless the ESA Committee (commonly called the God Squad) explicitly ruled that economics trump species recovery, OESF must abide by the law to recover listed species. This means the Conservationists' co-equal goals of environmental protection and fiduciary responsibilities are more legally defensible than DNR's preference for fiduciary responsibility over environmental protection. This view is further booster by the legal requirement for effective AM in the ESA HCP, and backed up by specific DOI AM guidelines.

### **Recommendations**

Without debating pros and cons in goal setting and AM, the importance is finding win-wins reconciliation that can be embraced by OFCO and DNR. This reconciliation is a doable task, and is founded on incentives of money, regulatory flexibility, and recognition, and on the ESA recovery principle of "Not Everything Everywhere All the Time" (NEEATT). We should be able to have environmental protection and satisfy fiduciary responsibility; we just need to plan for it.

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## APPENDIX A

### Problem-Scoping Key for Adaptive Management

From US Department of Interior Adaptive Management Technical Guide, p. iv,  
<http://www.doi.gov/ppa/upload/TechGuide.pdf>

**Williams, B. K., R. C. Szaro, and C. D. Shapiro. 2009. Adaptive Management: The U.S. Department of the Interior Technical Guide. Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC.**

The following key can help in dissecting a particular management problem and determining whether adaptive management is an appropriate approach to decision making. If the answer to any question in the key is negative, then an approach other than adaptive management is likely to be more appropriate.

1. Is some kind of management decision to be made?  
(see Sections 1.1, 2.1, 2.3, 3.1, and 5.5)  
No – decision analysis and monitoring are unnecessary when no decision options exist.  
Yes – go to step 2.
2. Can stakeholders be engaged?  
(see Sections 1.1, 1.2, 2.1, 3.1, and 4.2)

No – without active stakeholder involvement an adaptive management process is unlikely to be effective.  
Yes – go to step 3.

3. Can management objective(s) be stated explicitly?

(see Sections 1.2, 2.1, 2.2, 2.3, 3.1, 4.2 and 5.1)

No – adaptive management is not possible if objectives are not identified.

Yes – go to step 4.

4. Is decision making confounded by uncertainty about potential management impacts?

(see Sections 1.1, 1.2, 2.1, 3.1, 4.1, 4.2 and 5.2)

No – in the absence of uncertainty adaptive management is not needed.

Yes – go to step 5.

5. Can resource relationships and management impacts be represented in models?

(see Sections 1.2, 3.1, 4.2, and 5.1)

No – adaptive management cannot proceed without the predictions generated by models.

Yes – go to step 6.

6. Can monitoring be designed to inform decision making?

(see Sections 2.1, 2.3, 3.1, and 4.2)

No – in the absence of targeted monitoring it is not possible to reduce uncertainty and improve management.

Yes – go to step 7.

7. Can progress be measured in achieving management objectives?

(see Sections 1.1, 3.1, 4.1, and 4.2)

No – adaptive management is not feasible if progress in understanding and improving management is unrecognizable.

Yes – go to step 8.

8. Can management actions be adjusted in response to what has been learned?

(see Sections 1.2, 2.1, 3.1, 4.1, 4.2, 5.3, and 5.4)

No – adaptive management is not possible without the flexibility to adjust management strategies.

Yes – go to step 9.

9. Does the whole process fit within the appropriate legal framework?

(see Sections 2.3, 2.4, 3.2, 4.1, and 4.2)

No – adaptive management should not proceed absent full compliance with the relevant laws, regulations, and authorities.

Yes – all of the basic conditions are met, and adaptive management is appropriate for this problem.

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## APPENDIX B

### SMART Objectives

From US Department of Interior Adaptive Management Technical Guide, p. 24,  
<http://www.doi.gov/ppa/upload/TechGuide.pdf>

**Williams, B. K., R. C. Szaro, and C. D. Shapiro. 2009. Adaptive Management: The U.S. Department of the Interior Technical Guide. Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC.**

## Step 2- Objectives

### *Identify clear, measurable, and agreed-upon management objectives to guide decision making and evaluate management effectiveness over time*

Objectives, resource status, and learning all influence the choice of management interventions in adaptive management. But objectives also play a crucial role in evaluating performance, reducing uncertainty, and improving management through time. It therefore is important to have clear, measurable, and agreed-upon objectives at the outset, to guide decision making and assess progress in achieving management success (See Case Study 2 for a discussion of setting objectives).

The term “objective” is used here to mean some desired outcome or performance measure that can be used to guide decision making and measure success. Objectives typically are expressed in terms of management performance over the timeframe of a project. For example, measures might be harvest yield, population size, water flows, or the probability of a negative impact on resource status, with an objective of maximizing accumulated harvest, achieving a desired population size, maintaining water flow, or minimizing a probability of extinction.

Because management objectives are used to guide decisions in managing (and often changing) certain aspects of a target resource through time, they should be more specific than common, “broad-brush” statements or overall program purposes that appear in many project documents. For example, generic statements such as “provide public access and recreational opportunities” or “improve water quality to enhance and restore commercial fishing” are purpose statements indicating why management is to be undertaken, rather than objectives that can help to guide decision making.

Objectives should address the resource issue or problem that initially motivated management, and reflect the social, economic, and/or ecological values of stakeholders. Underlying an adaptive approach is the recognition that stakeholders influence what is to be managed and under what circumstances. Finding common ground among disparate and often contentious parties is not an easy task when there are differences in understanding about the resource system and differences in ideas about the desired focus and direction of management. For objectives to be realistic and mutually acceptable, parties must work toward an agreement on the purpose and approach to resource management and seek a common basis for recognizing management success. In particular, objectives should be defined cooperatively through a dialogue among managers, scientists, and other stakeholders.

In the context of adaptive management, objectives must be relevant to the decision making process and possess a number of attributes that render them useful as guides to management (52). To be useful for decision making and evaluation, objectives need to exhibit the following technical features:

- **Specific:**

Objectives should be unambiguous, with specific metrics and specific target conditions. Specificity can be encouraged by articulating objectives with Who, What, Why, and/or Where phrases.

- **Measurable:**

Objectives should contain elements that can be readily measured, so as to promote the evaluation of management actions and recognize their contributions to successful management.

- **Achievable:**

Objectives should be based on the capacities of the natural resource system being managed and the political or social system within which management occurs.

- **Results-oriented:**

Objectives should contain for resource endpoints and/or conditions representing their achievement. For example, a results-oriented habitat objective might describe the habitat conditions expected when the objective is achieved.

- **Time-fixed:**

Objectives should indicate the timeframe for achievement, consistent with the duration of the project. Project implementation may be in stages, but the overall timeframe should be clear.

# COMPARING RIPARIAN MANAGEMENT AND PROTECTIONS OVER TIME ON DNR MANAGED OLYMPIC EXPERIMENTAL STATE FOREST

Among 1997 HCP, Measured buffer widths 2004-2010, and Proposed RDEIS, 2013

Marcy Golde and Hellmut Golde

The following issues emerged from a comparison of riparian protection among the DNR HCP of 1997, an analysis of 87 sales from November, 2004 to 2010, and the RDEIS of 2013 and the Landscape Plan (LP): Inadequate riparian buffers widths, and changing and increasing harvest within the riparian buffers.

## ANALYSIS OF BUFFER WIDTHS

### 1997 DNR HCP

#### Interior Core Buffers

Uses HCP Table IV.5. Interior Core Buffer, (HCP, IV.58).

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]

#### Exterior Buffers

1. “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 habitats for riparian-dependent and upland biota.***” (IV.112) [Emphasis added.]

Standard Procedure: “...wind buffers will be placed on all riparian segments for which stand wind-firmness cannot be documented by historical information, windthrow modeling, (e.g., Tang 1995), 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 (i.e. excluding pre-commercial thinning and restoration activities) per rotation, until research is available supporting more frequent entry. ...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.”

Experimental Approach: “Foresters and managers will select from a number of experimental designs for the exterior buffer and apply the chosen design ... . The process will be documented and monitored closely...” (HCP, IV117-8)

DNR HCP, 1997 Buffers (in feet) in clear-cut harvest units

<b>Buffers</b>	<b>T1</b>	<b>T2</b>	<b>T3</b>	<b>T4</b>
<b>Ave. Interior Core</b>	150	150	100	100
<b>Ave. Exterior (Wind)</b>	150	150	150	50
<b>TOTAL</b>	<b>300</b>	<b>300</b>	<b>250</b>	<b>150</b>

(HCP Tables IV.5, 8)

**MEASURED BUFFER WIDTHS 2004-2010:**

The SEPA and FPA data does not always differentiate the Interior and Exterior (Wind) buffers.

Measured Timber Sale Buffers (in feet) from 2004 to 2010 on clearcut units were:

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

Data from SEPA and FPA documents

Although the data, because of the use of averages, obscures the range of actual riparian buffer widths ranged from 0 feet to 87.3 feet on a Type 3 fish stream for clear-cut 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 in this period. Three sales had interior buffers of 0 to 15 feet, thus averaging 7.5 feet. See data reports in Attachments.

The Total buffers, while significantly narrower, are all No Harvest buffers on sales where the upland harvest is a clearcut with 8tpa. 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.

## 2013 RDEIS + OESF LANDSCAPE PLAN:

“Under both options, the width of the interior-core buffer is considered an average rather than absolute value because the size and configuration of the buffer must vary locally to accommodate terrain and forest stand characteristics.” (Appendix A, p. 36)

### Interior Core Buffer

Type 1 and 2 streams: 150 feet,

Type 3 and 4 streams: 100 feet.

*“Two percent (by area) of all the interior-core buffers in any given Type 3 watershed will be harvested by variable retention harvest in any given decade.”* (RDEIS, 2-19)

That means using Option 2, fixed width buffers will be reduced by the acreage to be clearcut.

- Type 1 & 2 streams: reduced to an average 135.2 feet on 53 Type 3 Watersheds with a minimum of 98 feet, and
- Type 3 & 4 streams: reduced to an average 91.0 feet on 192 Type 3 Watersheds, with a minimum of 64 feet.<sup>3</sup>

### External Wind Buffer

“...will extend approximately 80 feet (horizontal distance) from the outer edge of the interior-core buffer.”

“DNR predicts that only approximately 1 percent of the interior core buffers for Type 1 through Type 4 streams across state trust lands in the OESF will require a wind buffer,” (RDEIS, 2-21)

“Severe endemic windthrow is defined as windthrow in which 90 percent of an area will experience 50 percent canopy loss.” (Appendix A, p. 36)

“Regardless of stream type, exterior buffers will be placed on all segments of interior-core buffers for which the likelihood of severe endemic windthrow is deemed unacceptable. DNR defines the acceptable likelihood as 5 percent.” (Appendix A, p. 36)

**Total Buffers** on most streams, excluding the 2% with variable retention harvest and the 1% with wind buffers, using Option 2 would be:

Type 1 and 2 streams: 150 feet,

Type 3 and 4 streams: 100 feet.

## **ANALYSIS OF HARVEST IN THE RIPARIAN BUFFERS**

### **COMPARISON OF HARVEST INTENSITY**

#### **HCP 1997:**

**Interior Core Buffers:** “(1) No timber harvest shall occur within the first 25 feet from the outer margin of the 100-year floodplain. ... (2) the next 75 feet shall be a minimal-harvest area. ...DNR anticipates that only two types of silvicultural activities will occur in this area: ecosystem restoration and the selective removal of single trees. (3)The

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<sup>3</sup> In the first decade 192 Type 3 watershed will have vrh out of a total of 587 watersheds. Thus 32.8% of all the Type 3 watersheds will suffer some degree of clear cutting [RDEIS Appendix A-2, p3-18].

remaining portion of the riparian buffer (more than 100 feet from the active channel margin) shall be a low-harvest area.” (HCP, IV.59-60)

**External Buffer:** Thirty-three percent or less, by volume, of the riparian trees in the designated exterior buffer may be removed for commercial purposes (i.e. excluding pre-commercial thinning and restoration activities) per rotation.

**MEASURED BUFFERS 2004-2010:** Riparian thinning management depends on the thinning density of the Uplands, as that harvest was extended to the final row of trees bordering the streams, or to water’s edge. When the Uplands were clearcut, always leaving only the required 8 trees per acre, then the Inner and Exterior zones were left unharvested.

**RDEIS 2013:**

The Appendix A-2 shows the variable retention harvest (vrh) allowed in the Interior Core buffer, in each of the Type 3 Watersheds for the first decade. In the first decade 192 Type 3 watersheds will have vrh out of a total of 587 watersheds or 32.8% of all the Type 3 watersheds will suffer some degree of clear cutting [RDEIS Appendix A-2, p3-18]. The shape of the buffers will differ with which Option for laying out the buffer is chosen, but none of these 193 impacted watersheds will receive the full Interior Core buffers. Under Option 2 due to clearcutting, the loss of buffer width varied from 1 foot to 37 feet, with the average loss of nine feet from a 100 foot buffer.

Of course only 1% of any of these watersheds will receive the protective wind buffers as compared with the “anticipated for 75-85% of the riparian areas” [HCP IV-118] in the 1997 HCP.

**Interior Core Buffers:** “...DNR allows activities that support the integration of revenue production and ecological values. These activities include the following: precommercial thinning, selective harvest of hardwoods..., uniform and variable density thinning of forest stands..., and research projects...” (RDEIS, 2-18), and with potentially repeated harvests.

**Exterior Buffer:** Given to only 1% of streams, and subject to potentially repeated harvest.

**SUMMARY:**

The Landscape Plan and its RDEIS both reduce the buffer widths and increase the harvest in those buffers over those in the 1997 HCP, and the Measured Buffers from 2004 to the 2010, and in fact over those still being proposed as this review is written.<sup>4</sup>

**BUFFER WIDTHS**

The main difference between the 1997 HCP and the measured averages from 2004 to 2010 was in the reduced average width of the Interior Core Buffers. The DNR HCP intended the Interior buffer to protect ALL the aquatic needs. The measured Exterior Buffers closely approximate the requirements in the DNR HCP, 1997 (Table IV.8, p. IV.117). The harvest was very sharply limited.

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<sup>4</sup> See FPAs 2612602 and 2612671

The 2004-2010 measured deficiency in the total buffer width derived from the severely inadequate Interior Core Buffers, but full Exterior buffers were added. No harvest was allowed in either buffer.

The main differences with the RDEIS 2013 Landscape Plan, however, is that only 1% streams would have Exterior buffers, compared with 75-85% of the streams under the 1997 DNR HCP and very extensive harvest in the buffers is planned.

#### **HARVEST INTENSITY**

The 1997 HCP allowed very, very limited harvest in the Interior Core. The Measured Buffers from 2004-2010 had no harvest if the upland was clearcut, and were indistinguishable for the thinned uplands. The RDEIS calls for significant repeated thinning and limited clearcutting in the Interior Core.

#### **COMPARISONS IN GRAPHIC AND TABLE FORMAT**

**1997 DNR HCP<sup>5</sup> foresaw Inner and Exterior buffers with Exterior buffers on 75-85% of streams. Note that these buffers were assumed to provide 50% of all Northern Spotted Owl (NSO) habitat. No additional NSO habitat has been added as the buffers became smaller over time.**

**The Measurements 2004-10<sup>6</sup> show Inner Core and Exterior buffer widths from SEPA checklists.**

**RDEIS 2013<sup>7</sup> proposes Exterior buffers on 1% of streams. Streams in 32% of the Type 3 Watersheds will receive some Variable Retention Harvest (vrh, i.e. clear-cutting leaving 8 trees per acre). The RDEIS estimates vrh on approximately 2% of the acres in these watershed.**

**11-23-1999. Washington Department of Natural Resources – Habitat Conservation Plan – Riparian Management Procedures – Scientific Committee Recommendations. Jeff Cederholm, Chair.** Three days before the Comment deadline, this important document was rediscovered in the DNR files. Its detailed analysis and recommendations provide an important incite to the changes which occurred less than two months later with the change in Land Commissioners in January, 2000. The complete report is included at Appendix B.

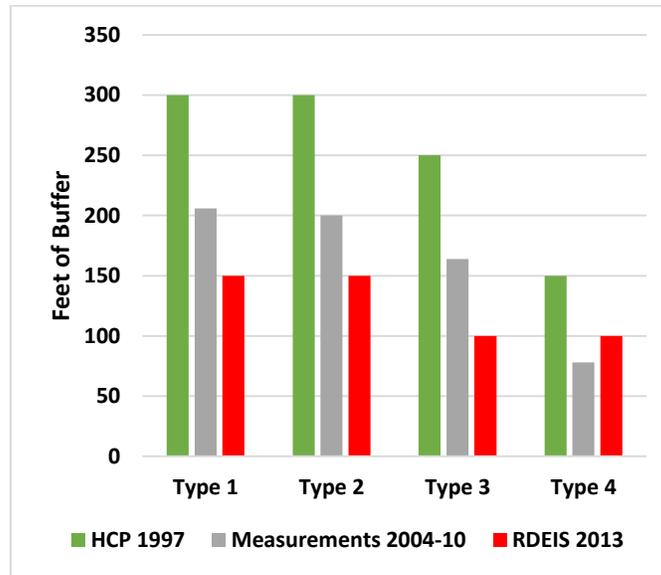
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<sup>5</sup> DNR HCP, IV.58.

<sup>6</sup> See Comments, 2010.

<sup>7</sup> Olympic Experimental State Forest HCP Planning Unit Forest Land Plan, Revised Draft, p. 2-20; Appendix A, p. 33.

### TOTAL BUFFER WIDTHS



Stream Type	DNR HCP 1997			Measurements 2004-10			OESF Forest Land Plan & RDEIS 2013		
	Inner Core	External	TOTAL	Inner Core	External	TOTAL	Inner Core	External	TOTAL
Type 1	150'	150'	300	59'	150'	206	150	na	150
Type 2	150'	150'	300	57'	143'	200	150	na	150
Type 3	100'	150'	250	25'	146'	164	100	na	100
Type 4	100'	50'	150	20'	54'	78	100	na	100

Some Measurements 2004-10 sites used only total buffers, thus causing the minor differences in totals. In the 2013 L.P. 2% of acres of buffer, on average, receive vrh (clear-cut) in 32% of Type 3 Watersheds. In the 2013 L.P. only 1% of Type 3 Watersheds, on average, receive external wind buffers. Note that the great majority of streams are Types 3 and Type 4.

#### SUPPLEMENTAL MATERIAL:

T1, T2, T3, T4 Riparian Data Sheets

# T1 Riparian Buffers with Clearcut Sales

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

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

**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.

# T2 Riparian Buffers with Clearcut Sales

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

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

**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

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

**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

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

**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.

# Riparian and Forest Stands

Darrell Smith

## Background

In April 2012, I spent two days in the field reviewing 12 Forest Practice Applications (FPAs) in the Hoko and Clallam watersheds within the Olympic Experimental State Forest (OESF). I initially concentrated on riparian analyses but looked at forest stand mapping and habitat characterization as well within the watershed. Several of the FPAs were for timber cuts that had already occurred. My field review was in conjunction with an additional two days of office work comparing my field observations and notes with Washington State Department of Natural Resources (DNR) field maps and several layers of current and historic aerial mapping and habitat coverage of the past and proposed cuts and the forest stands and landscape in which they occurred.

As a professional wildlife, fisheries and wetlands biologist, Stillaguamish River Steward, and ultimately Principal Habitat Biologist for Snohomish County government, I have reviewed hundreds of FPAs and have done extensive “on the ground” forest habitat mapping work for more than 20 years. DNR has a large working forest base within Snohomish County and timber harvest is very important to substantial segments of the community. FPAs generally get careful review. In Snohomish County, I have been accustomed to seeing very accurate and generally thorough stream and forest mapping work, which was reflected in the FPAs forwarded by WDNR.

In stark contrast, however, in this small sample of watersheds and sub watersheds I examined within the OESF, I noted what I believe to be more than 20 substantial stream and forest habitat underlying mapping errors on which the FPAs were based. I estimated, therefore, that nearly 25% of the riparian, stream and forest habitat I examined was either not properly mapped or was mischaracterized. In addition, some slopes appeared to be mismapped and leave areas were mischaracterized. There was very heavy windthrow on several upslope and headwater areas resulting from timber harvest activity.

WDNR has spent a great deal of time and effort developing and refining their *Forest Estate Model*. The Department states that their environmental analyses rely *primarily* on the outputs of this model. The Forest Estates Model, the stream reach and watershed scoring and any other landscape-planning model used by WDNR relies primarily on accurate and accurately characterized habitat input data. If the model assumptions and input parameters aren't true, then model results are at best misleading and more likely simply not useful in planning and analysis.

## Conclusion

The Forest Estates Model input appears badly compromised by inaccurate, out-of-date or misleading mapping and habitat information. The RDEIS environmental analyses rely primarily on output from the Forest Estates Model. Bad model input into good models results in bad model output, as modelers constantly warn biologists and planners and policy makers. Therefore, this RDEIS document is not

reliable. Ground-truthing appears to be so bad that DNR may have a real shortage of qualified field people in the OESF.

## **Landslides and Watershed Assessment**

David Montgomery, Ph.D. geomorphologist (WA State Geology License #520)

Re: Olympic Experimental State Forest HCP Planning Unit Forest Land Plan, Revised Draft.

I have examined the Revised Draft of the Olympic Experimental State Forest HCP Planning Unit Forest Land Plan. I offer the following comments, organized by page and topic.

Page 3-24 to 3-25, Watershed scores: There is a high degree of apparent arbitrariness in setting the definitions for high, medium, and low impacts; in defining a 10% threshold of high impact area in a watershed as amounting to a low impact, and up to a 20% area of high impact as amounting to a medium impact, the analysis explicitly discounts the rationale behind the state having promoted the idea of watershed analysis in previous decades—that is that the potential landscape-scale impact of an activity depends not only on how much of the landscape is covered by that activity but where on the landscape it occurs. If high-risk activities occur on a small area of vulnerable ground it can have a disproportionate impact on the landscape. This is a basic principle of watershed analysis that seems to be explicitly ignored in DNR's method for "computing" a high, medium, or low impact.

Pages 3-52 to 3-54; Roads: DNR apparently does not assess the current influence of roads on fine sediment delivery, and simply assumes no change to the road network over time defining little net impact. I question how this can be considered to amount to an environmental impact assessment when the assessment involves calculating an abstract traffic impact score and then explicitly avoid consideration of the sensitivity of the receiving stream channel in evaluating the environmental impact.

Page 3-56, composite watershed score: DNR applies arbitrary weighting to various indicators to arrive at a composite watershed score. The approach again neglects to consider the varying importance of different features (and indicators) in different portions of the same watershed. The lack of a spatial structure to the composite assessment makes it a very crude tool indeed. Why, for example, would "coarse sediment" amount to less than 10% of the impact score for a place like the channels downstream from Huelsdonk Ridge, where the coarse sediment impacts were devastating for certain salmon bearing streams, but did indeed only cover a small portion of that basin?

Pages 3-95 to 3-97 and 3-114, Landslides: The approach DNR presents explicitly relies on "field staff (foresters and engineers)" to "identify unstable slopes". The document notes that "If field staff are uncertain about indicators of instability they request that a geologist visit the site". This puts potentially untrained and unqualified personnel in the position of practicing geology by identifying areas of potentially unstable ground or by making a determination that no potentially unstable ground is present. This would appear to violate state standards for the practice of geology by allowing unlicensed personnel to make geological assessments. In the revised OEF plan environmental impact statement DNR simply assumes that its standard practices defer areas of high risk from harvest. How well this assertion is met in practice is neither discussed nor evaluated in the EIS, despite the recent natural experiment in southwestern Washington that

tested the efficacy of state forest practice rules and practices in regard to steep slopes. I may be mistaken, but I seem to recall that the "post-mortem" study of that event found a several fold greater rate of sliding in recently harvested terrain than in mature timber.

Page 3-102 to 3-103, landslides: the analysis in table 3-25 that shows that 60% of the watershed administrative units in the OEF have <1% of a high soils with a likelihood of landsliding is either missing the point about the dominant controls on landslides or is itself misleading. If the point is to show that particular soil types that are especially prone to landsliding are not common in the OEF then the real question in regard to slope stability is then the other controls (like slope steepness) as the small areas of "bad soils" is mostly irrelevant to assessing difference in the landslide hazard within the OEF. If the point is to try and show that landslides are a high hazard on <1% of the terrain in across most of the OEF then it is truly an astounding "analysis" given the amount of historical landsliding from steep slopes on the western Olympic Peninsula.

Page 3-104, landslides: There is a very arbitrary assessment of what constitutes a high hazard from soil erosion or landsliding buried in the statement "DNR considers a potential high impact to be four or more harvest entries (variable retention harvest or thinning) on soils with a high likelihood of compaction, erosion, displacement, or landslides, or that are the least productive, over 100 years." In other words, as I read this an area could be disturbed or harvested (partially) every 25 years and not be considered to have a high impact potential from soil erosion or landsliding. Yet as root re-growth following harvest takes approximately this time frame the defined criteria would allow codifying an perpetual state of reduced root strength as not being a "high impact". This does not sound reasonable to me.

Page 3-109, landslides: the definition of sites with a high likelihood of landslides as only those areas with soils developed on top of basalt or marine sediment on slopes greater than 70% is not a credible way to analyze the potential for slope instability on the steep slopes of the western Olympic Peninsula, such as the Middle Hoh and Upper Clearwater River basins. The slopes in these areas are steep enough that even a rudimentary slope stability model can readily illustrate the potential for a change in root reinforcement to influence the stability of slopes underlain by the marine sedimentary rock that dominates these areas. The history of landsliding in the area also shows a clear potential for post-harvest slope failures from slopes that are not underlain by basalt or marine sediments. The application of a lithologic criterion that was derived from the post-mortem study of the slope failures in SW Washington does not translate directly to the OEF in the manner implied in this document. Indeed, the subsequent statement "This relative scarcity of potentially unstable areas is reflected in the results for this indicator" is one of the most circular statements I have ever read in an EIS. Here DNR first defines an indicator for high hazard that is known to have little areal extent in the OEF (basalt and marine sediments, as opposed to sedimentary rock) and then trumpets that it finds little area at risk from landsliding by applying that metric—completely circular logic.

# Climate Change

Shelley Spalding

This review of the Olympic Experimental State Forest (OESF) HCP Planning Unit Forest Land Plan Revised Draft EIS (RDEIS) is provided on behalf of the Olympic Forest Coalition. The review will analyze potential impacts from climate change as well as the importance of the Olympic Peninsula for climate change adaptation by fish and wildlife for both the No Action Alternative (NAA) and the Landscape Alternative (LA).

The Olympic Peninsula encompasses at least three distinct ecosystems: subalpine forest and wildflower meadow; temperate forest; and the rugged Pacific shore. Because of the Peninsula's relatively unspoiled condition and outstanding scenery, the United Nations has declared the Olympic Peninsula both an international biosphere reserve and a World Heritage site. For our Pacific salmonids, including bull trout, the Peninsula's rivers and streams likely provide the "last, best place" in the coterminous United States for wild salmon and bull trout. There are few better rivers to fish than the Solduck, Calawah, Bogachiel, Hoh, Queets or Quinault and a few of their tributaries. Although old-timers will tell you they aren't what they used to be, these streams remain healthy and productive while others all over the Northwest are foundering.

The RDEIS briefly addresses carbon sequestered and emitted in forest stands. It also briefly acknowledges the vulnerability of tree species to climate change and the predictions about increased precipitation and storm intensity resulting in the potential for increased landslides and debris flows. We recommend that the final REIS add a section to compare the anticipated outcomes of each alternative in protecting Threatened and Endangered Species such as the marbled murrelet, northern spotted owl, bull trout and Lake Ozette sockeye populations for the long term in the face of climate change, and if the actions in the proposed alternatives are likely to be sufficient to sustain populations of these species in the face of expected climate change effects. A recent publication jointly produced by the Olympic National Forest and Olympic National Park provides a wealth of analysis, scientific information, and recommendations to assist land management agencies with implementing actions that foster adapting to climate change on the Olympic Peninsula (Halofsky, J.E. Et al. 2010).

We realize that it not be possible to have a definitive, quantitative discussion on the future impacts of climate change on the flora and fauna of the Peninsula. However, a qualitative discussion would add an important component to the decision making process and improve the public's ability to understand the expected outcomes of the alternatives.

## HEADWATER STREAMS AND TYPE 5 WATERS

*Chris Mendoza, Mendoza Environmental, LLC.*

*Representing the Olympic Forest Coalition and Conservation Caucus.*

### *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 Conservation Caucus' 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).*

*The Conservation Caucus' comments to DNR's HCS were directed to Tamara Miketa and Richard Bigley (March 2009) along with DNR's response to those comments submitted by Tamara Miketa (January 2010) (Appendices B & D, Conservation Organizations' Comments July, 2010) .. Many of DNR's responses to the CC's comments, were not adequately addressed or 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 (RDEIS 2013) and other State lands covered under the HCP (1997); 1) the inaccuracy of DNR's hydro layer for determining Water Types (1-5, 9), 2) the requirement that DNR provide accurate and complete mapping of all typed waters prior to approving forest practice permits, and 3) the failure of DNR to comply with the physical criteria for determining Type 4 and Type 5 waters outlined in their HCP (1997), and consequently, may not be providing adequate stream buffer protections.*

Analyses of the potential impacts of timber harvest on riparian functions (indicators) generated from the newly proposed Riparian Model in the RDIES (2013) will likely be affected by changes in water typing as depicted by DNR's existing Hydro-layer if LiDAR is acquired and utilized. It would be greatly beneficial to know the degree to which DNR has incorporated LiDAR into their Riparian Model analyses for the purpose of determining adverse environmental impacts. Based on previous comments to the DEIS (2010), and repeated here, the CC continues to fully support DNR's "proposed solution" to acquire LiDAR coverage for all State Lands covered under the HCP.

Lastly, the CC has requested on multiple occasions over the past three years that DNR provide the channel width data from the streams included in both their compliance monitoring program and their "Retrospective Analysis" on Type 5 waters. The CC has yet to receive any data from DNR on channel attributes (e.g. channel width) from either of these projects.

#### **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 requirements (Type 4 waters require 100 ft. buffers, Type 5 waters may be clearcut if not associated with unstable slopes)? The CC was informed by DNR staff that the Type 5 Retrospective Study was less concerned about compliance with the rules

on water typing governing their HCP and more concerned about how streams buffered 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 or only partially buffered depending on their proximity to unstable slopes. 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 three years, but has yet to receive anything. Based on DNR's 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 it stands to reason that field crews must have also collected channel width data, particularly since they were by definition conducting a "Type 5" study (see Water Type definitions above). 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 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.*

**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 NOT have pre-harvest data, nor would compliance monitoring, so while it may be convenient for DNR 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 conclusions could only be generated from a BACI type study (Before-After-Control-Impact) which controls for such "factors" before, during and after measuring 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 be generated BEFORE 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 claim 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 (100 ft. riparian buffers) and Type 5 waters (clearcut or partially buffered) *without exception* for potential or unknown impacts to channel conditions in the absence of research and monitoring results lacking scientific merit.

### *Water Typing and Modeled Stream Densities in the OESF*

I examined two versions of the 2010 DEIS for the OESF with tables (3-xx, later called version 3-26) for modeled stream densities, one dated October 2009 (a draft) 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 depicted by 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 input 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 inaccurate for the Washington Forest Practices Board to adopt as rule under the WA Forest Practices HCP (WFP Board meeting 2006). 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 and channel gradient often encountered in the Puget Sound lowlands and the foothills surrounding the Olympic Mountains. Many of these fish habitat model shortcomings are highlighted in the DEIS for the OESF from 2009.

Draft 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 mi
	Type 1 mi (%)	Type 2 mi (%)	Type 3 mi (%)	Type 4 mi (%)	Type 5 mi (%)	Type 9 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 author’s 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). Research conducted by CMER 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, so the author’s statement is consistent with CMER’s findings since this is the same model used by DNR.

The last version (June 2010) of the DIES OESF makes slight changes to Draft 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 (2010), 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<sup>2</sup> for Type 1 waters, 0.12 mi/mi<sup>2</sup> for Type 2 waters, 1.06 mi/mi<sup>2</sup> for Type 3 waters, 0.92 mi/mi<sup>2</sup> for Type 4 waters, 4.07 mi/mi<sup>2</sup> for Type 5 waters, and 0.08 mi/mi<sup>2</sup> for Type 9 (unclassified) waters.”*

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

Watershed Administrative Unit	Stream Length (miles) by Water Type						Total
	Type 1	Type 2	Type 3	Type 4	Type 5	Type 9	
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
<b>Total</b>	<b>138</b>	<b>50</b>	<b>447</b>	<b>389</b>	<b>1,720</b>	<b>34</b>	<b>2,777</b>

<sup>2</sup> 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).

<sup>3</sup> The "private" category includes industrial forestland, agricultural lands, and residential, industrial, and commercial lands.

<sup>4</sup> 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."*

Based on over 15 years experience from personnel with expertise in field validating DNR's hydro-layer, CMER's Fish Habitat Model validation results, and DNR staff's comments above concerning Type 4 and Type 5 waters needing "upgrading", the Conservation Caucus strongly believes that a substantial portion of Type 5 waters in the OESF, and located on 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 staff concerning the inadequacy of their hydro-layer to accurately delineate the presence of headwater streams was most recently verified by 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" (Ricklefs Power Point, Appendix A & D, Conservation Organizations' Comments, July, 2010).

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 when screened 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 largely from the use of a 10 m DEM.

It is unclear in the RDIES (2013) the extent to which LiDAR was used, if at all, in DNR's Riparian Model that analyzes riparian functions ("indicators") for "Type 3 Watersheds" from which impacts from timber harvest on riparian functions are derived through "Composite Watershed Scores" (Chapter 3, RDEIS 2013). DNR's RDIES states, "DNR has not indentified probable significant adverse environmental impacts from either alternative for large woody debris recruitment, peak flow, stream shade, riparian microclimate, or the composite watershed score." (Page 3-25, RDEIS 2013). Correcting for gross inaccuracies in water typing via LiDAR could potentially affect both individual indicator and Type 3 Watershed composite scores given that the greatest proportion of the channel network in Type 3 Watershed is composed of Type 4 and Type 5 waters (Table 3-26 above).

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 in the OESF, any and all analyses included in the RDIES (2013) concerning potential impacts to indicators from timber harvest in headwater streams (Type 4 and Type 5 waters) should be rendered invalid. We encourage DNR to continue mapping ALL forestlands covered under their State Lands HCP (1997) 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 Forest Practices 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 intent of adding to the distribution of sites covered by CMER 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 recommendations to the Washington State Forest Practices Board concerning forest practices rule changes.

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 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 CMER (Palmquist 2005) and the NWIFC (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 (1997). In the memorandum from DNR (January 2010) they 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 to 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 valid or 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 its potential usefulness to the 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 or provided limited buffering. 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. The CC fails to see the usefulness of such studies without first validating the stream type / hydro-layer as required by rule under DNR's HCP. 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*

The existing DNR hydro-layer was derived from a 10 meter DEM and 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 DNR's hydro-layer. Based on Mr. Ricklefs' presentation to CMER, the Conservation Caucus strongly supports Mr. Ricklefs' "proposed solution" to continue to replace DNR's existing hydro-layer with one that incorporates LiDAR instead of an outdated 10 m DEM. 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."*

It is unclear in the RDIES (2013) the extent to which LiDAR was used in DNR's Riparian Model that analyzes riparian functions ("indicators") for "Type 3 Watersheds" from which impacts from timber harvest on riparian functions are derived through "Composite Watershed Scores" (Chapter 3, RDEIS 2013). DNR's RDIES states, "DNR has not identified probable significant adverse environmental impacts from either alternative for large woody debris recruitment, peak flow, stream shade, riparian microclimate, or the composite watershed score." (Page 3-25, RDEIS 2013). Correcting for gross inaccuracies in water typing via LiDAR could substantially affect both individual

“indicator” scores that in turn would influence Type 3 Watershed “composite scores” given that the greatest proportion (total channel length) of the channel network in Type 3 Watersheds is comprised of Type 4 and Type 5 waters (Table 3-26 above). Until such LiDAR revisions take place, riparian model generated analyses (RDIES 2013) related to the potential impacts of timber harvest on “indicators” in headwaters streams of the OESF should take such inaccuracies into account. In the absence of LiDAR, adopting a more precautionary approach to headwater stream modeling that corrects for such inaccuracies is strongly recommended.

Second, DNR’s Retrospective Analysis 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 Conservation Caucus has repeatedly requested channel width data from DNR staff over the past 3 years 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, send the CC 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. The CC questions 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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# Comparing Road Protections Over Time Among 1997, HCP; OESF LANDSCAPE PLAN DEIS 2010; and Proposed RDEIS, 2013

Marcy J. Golde

## 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.

### DNR HCP 1997 on Roads

#### OBJECTIVES

*“Comprehensive Road-Maintenance Plans. The objectives ...are to:*

*(1-4) Covered by RMAPs Plans.*

*(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;*

#### 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)*

### DEIS 2010:

- 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 Cederholm, 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. 2010	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
<b>TOTAL Roding (new&amp; reconstruction) in OESF 10/2004- 6/2010</b>			<b>52.37 mi. (276,533 ft.)</b>	<b>15.16 mi. (80,070 ft.)</b>

#### 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 decommissioned, but not recorded on the SEPA documents. They would not be shown on the Forest Practices Application.

**DEIS 2010 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)

**RDEIS 2013**

*“For this analysis, DNR assumes the extent of the road network in the OESF will remain essentially unchanged under both alternatives throughout the 100-year analysis period. (RDEIS, 3-103)*

Potential Road Failures

<b>Landscape</b>	<b>% of Road Network</b>	<b>Impact</b>
Clallam	17%	High
Clearwater	23%	High
Copper Mine	13%	High
Dickodochtedar	3%	Low
Goodman	3%	Low
Kalaloch	8%	Medium
Queets	3%	Low
Reade Hill	16%	High
Sekiu	10%	Medium
Sol Duc	7%	Low
Willy Huel	20%	High

*“Potential road failure will be mitigated to a non-significant level through repair and maintenance of roads identified in road maintenance and abandonment plans... . Therefore, DNR has not identified probable significant environmental impacts under either alternative for this indicator.”*

*“Following, DNR describes current management practices (established programs, ruled, procedures, or other practices) that are expected to mitigate potential high impacts to a level of non-significance. This mitigation applies to the indicator potential road failure.(RDEIS, p. 3-111)*

Road Density

Landscape	Road Density (roads per square mile)	Impact
Clallam	4.3	High
Clearwater	3.7	High
Copper Mine	5.0	High
Dickodohtedar	4.5	High
Goodman	4.2	High
Kalaloch	5.0	High
Queets	5.0	High
Reade Hill	3.7	High
Sekiu	4.7	High
Sol Duc	3.7	High
Willy Huel	4.1	High

All of the Landscape Planning Units exceed the Cederholm safe level of 2.5 miles per square mile. Two Cooper Mine and Queets are double the safe level. Projected acres of harvest more than 800 feet from an existing road in first decade are high on two Landscapes. The Clallam with 1,103 acres and Sol Duc with 2,610 acres appear to require significant new road building. Currently 144 miles have been well protected from erosion with decommissioning of 120 miles and approved abandonment of 24 miles out of 1,824 miles of road in the OESF. (Appendix C, p.20) There is no indication of how they will be protected in the future, as Road Maintenance and Abandonment Plans are a onetime review and repair.

*“DNR expects potential fine sediment delivery from the road network to be mitigated to a non-significant level through current management practices, including the accomplishment of road maintenance and abandonment plans; inspecting, repairing and maintaining roads; and suspending timber hauling during storms.” (RDEIS, p. 3.127\_*

**Supplemental Material:** Roads Data Sheet

## ***Roads by Date of SEPA Approval***

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

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

## BULL TROUT

Shelley Spalding

This review of the Olympic Experimental State Forest (OESF) HCP Planning Unit Forest Land Plan Revised Draft EIS (RDEIS) 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 RDEIS 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 Revised Draft Landscape Plan for the OESF for the specified stream types. Bull trout have been found in streams throughout the OESF, including Cedar, Mosquito, Goodman, Matheny, and Kalaloch Creeks as well as the Hoh, Calawah, and Queets Rivers. New sitings of bull trout in streams where they previously were undocumented continue to occur, and current distribution information may not reflect the extent of their presence within the OESF.

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, proximity to hyporheic zones, spawning and rearing substrate, and migratory corridors (Goetz 1989; Howell and Buchanan 1992; Rieman and McIntyre 1993, 1995).

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 RDEIS alternatives are predicted to impact stream shade, 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.

One of the most important factors affecting bull trout spawning site selection as well as in maintaining cold water throughout rivers and streams, is the hyporheic zone. Because channel morphology exerts a primary control on shaping the hyporheic zone in mountain stream networks, any process that influences channel morphology also has the potential to influence hyporheic exchange flows. Many land-use activities influence channel morphology – from building dikes and stream-side roads that simplify platform geometry to altering inputs of both large wood and sediment through logging related changes in erosion and mass wasting (Wondzell et al., 2009). Water temperatures in the hyporheic zone are also typically buffered and lagged, with respect to diel changes in stream temperature. As a consequence, upwelling environments are of special interest, because upwelling water has the potential to be thermally or chemically distinct from stream water. In the Swan River basin in Montana, bull trout spawning site selection was positively correlated with the location of “knickpoints” where hyporheic upwelling tended to occur (Baxter et al. 1999). By only analyzing the impact of stream adjacent shade on stream temperatures, the impacts from both alternatives on bull trout and other salmonids' habitat, especially stream temperatures, are greatly simplified.

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

1. Extensive spawning and overwintering migrations of adult bull trout, which require a large network of suitable freshwater habitat with migratory corridors;
2. Use of deep pools by both adults and juveniles for cover and thermal refuge;
3. 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. Most streams within the OESF area are already lacking in large wood and riparian prescriptions under the current planning need to address this deficiency by not further reducing future recruitment of large wood to the rivers and streams.

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 RDEIS 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 RDEIS 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; impacts to groundwater and hyporheic sources, 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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# Northern Spotted Owl

Dave Wertz, Conservation Northwest

## Overview

DNR's Revised Draft Forest Plan for the Olympic Experimental State Forest (OESF Plan) fails to meet conservation objectives for the northern spotted owl. DNR's HCP requires the OESF Plan to provide the necessary quality, quantity and distribution of owl habitat in each landscape unit for demographic support towards the long-term conservation of the Olympic owl population. The OESF Plan's reliance on faulty assumptions that conflict with basic and well-documented spotted owl biology and its failure to consider substantial owl threats would create conditions that appreciably reduce chances of owl survival and recovery. Its landscape-level planning and EIS do not ensure that the OESF will be occupied by successfully reproducing spotted owls that function as a segment of the Olympic owl population. The OESF Plan will likely have a significant adverse environmental impact that was not disclosed or considered in the EIS, and should be withdrawn until its deficiencies can be resolved.

## Background

DNR's objective for spotted owl conservation on Washington State's public forests is to provide habitat that makes a "significant contribution to demographic support, maintenance of species distribution, and facilitation of dispersal." (DNR HCP, p. IV.1) Demographic support is the contribution of individual territorial spotted owls or clusters of spotted owl sites to the stability and viability of the population (Hanson et al. 1993).

The HCP's spotted owl conservation strategy for the OESF has three objectives:

1. 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."
2. to develop, test, and refine management practices for stands "functioning as dispersal, foraging, roosting, and nesting habitat for spotted owls."
3. to develop, implement, test and refine landscape-level forest management techniques that support "occupancy by successfully reproducing spotted owls that are functional segments of the Olympic Peninsula subpopulation." (HCP, p. IV.86)

One landscape management technique presented in the HCP is the working hypothesis that "landscape managed for a fairly even apportionment of forest cover among stands in all stages of development, from stand initiation to old growth (Oliver and Larson 1990) will support desired outputs of commodities and ecosystem functions." (HCP, p. IV.87) The HCP also posits another working hypothesis that "DNR can meet its objectives for commodity production and spotted owl conservation on the OESF by managing each landscape planning unit to maintain or restore threshold proportions of potential habitat." (HCP, p. IV.88).

The 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 of DNR-managed lands in the landscape planning unit in the stem-exclusion to old-growth stages that are potential old-forest, sub-mature, or young-forest

marginal spotted owl habitat types, including and old-forest habitat described in (1) above.

In keeping with its adaptive management principles, DNR's 1997 HCP recognized that the knowledge at the time was insufficient to answer questions about integrating conservation and production. The HCP's working hypotheses were intended to be evaluated, applied systematically and refined (HCP, p. IV.88). As new information and understanding developed over time, it would be incorporated into plans and activities, allowing DNR to "apply this knowledge, adjusting management activities and techniques and revise assumptions and hypotheses." (HCP, p. IV.86).

#### The OESF Revised Draft Forest Plan

The Revised Draft Forest Plan for the Olympic Experimental State Forest presents its own spotted owl conservation objectives:

- To restore and maintain northern spotted owl habitat capable of supporting owls in each of the 11 landscapes in the OESF; and
- To develop and implement a forest plan that does not appreciably reduce the chances for owl survival and recovery.

To assess progress towards objectives and consider whether the OESF Plan has probable significant effects on the environment, DNR crafted three indicators:

1. Number of acres of modeled owl habitat (Old Forest and Young Forest)
2. Numbers of acres of modeled owl habitat types
3. Number of modeled potential owl "territories"

For modeled owl habitat, DNR assigned each landscape an "impact rating" based on whether modeled habitat amount is projected to increase, remain even, or decrease.

For modeled owl habitat types (Movement, Roosting, Foraging, Nesting), DNR used stand-level models to generate a score (0-100) for each habitat type in each forest stand. It then assigned an impact rating based on the number of stands with a score 50 and above.

For modeling potential owl territories, DNR used habitat scores from 500 model runs to identify the number of potential owl "territories" the OESF could support over time. DNR then assigned an impact rating based on whether the number of potential owl "territories" was projected to increase, remain even, or decrease.

The impact ratings were used to determine that there is no probable significant adverse environmental impact from either alternative on the indicators.

#### Analysis

1. DNR must update its working hypotheses and underlying assumptions to align with modern science.

The notion that "even apportionment of forest cover among stands in all stages of development" over time can provide demographic support for owl conservation is antiquated. The hypothesis

has been nullified. Spotted owl survival, fecundity, and abundance are higher in areas with greater amounts of old forest habitat (Bart and Forsman 1992, Bart 1995). Large blocks of habitat supporting multiple pairs of owls are more likely to contribute to long term owl 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). Fragmentation of large blocks of habitat is associated with reduced demographic performance (Courtney et al. 2004), particularly on the Olympic peninsula where spotted owls have larger home ranges due to reliance on northern flying squirrels which have low population densities.

Similarly without merit is the notion that an “unzoned forest” can provide functional nesting habitat (supporting individual territorial spotted owls or clusters of spotted owl sites for stability and viability) for spotted owls. Spotted owls exhibit high nest site fidelity. Spotted owls with established territories are likely to be more successful if they remain in those territories (Franklin et al. 2000). Circles matter more than ever.

Furthermore, few of the assumptions underlying DNR’s conservation strategy for the OESF can withstand scrutiny today. Most of the factors related to owl population stability in the Olympics, such as 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, have changed substantially since 1997.

It was believed at the time, for instance, that the Olympic subpopulation was substantially larger, interconnected, and 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 population was secure (HCP, p. IV.102). The HCP’s heightened expectations of a stable owl population prompted “considerable flexibility in developing a conservation strategy for DNR-managed lands.” (HCP, p. IV.101).

None of these primary assumptions remain valid. Recent analysis on spotted owl demography performance in the Olympics indicate that spotted owls are not stable, and have declined at a rate of 4.3% a year between 1992-2008 (Forsman et al. 2011). Owl populations in the more rapidly declining populations, including the Olympics, dropped by 40-60% over a 10 year period (Forsman et al. 2011). Data hasn’t been collected on DNR lands since 2001, but occupancy rates of spotted owl territories in adjacent federal lands have declined by 60% between the early 1990s and 2008 (Gremel 2008).

Despite an abundance of new information and understanding about spotted owl biology and conservation, DNR has made no adjustments or revisions to its assumptions or working hypotheses, and it continues to rely on a scientifically-unsupportable management strategy. DNR’s outdated approach is likely to have significant adverse environmental impacts that are not disclosed or considered in the EIS.

With new knowledge and information related to spotted owl conservation science, DNR must consider adjustments or revisions to its assumptions, working hypotheses, and landscape management techniques intended to provide demographic support to the Olympic owl population.

2. DNR must update its working hypotheses and underlying assumptions to align with modern policy.

The OESF Plan must incorporate and apply current owl conservation policy. Although lands covered by HCPs are typically considered compliant the Endangered Species Act when they provide for the conservation of key habitat areas and occupied sites (USFWS 2012, p. III-52), the OESF Plan area is a distinct anomaly. It is unique not just to the DNR HCP, but all HCPs. Through a subsequent planning process, just now being seriously initiated, OESF Plan actively adjusts plans and activities to incorporate and apply new social and ecological knowledge to meet its objectives. It's designed to be dynamic, current, and evolving.

In 2012, the US Fish and Wildlife Service (Service) issued its Revised Spotted Owl Recovery Plan, finding that past habitat loss, current habitat loss, and competition from barred owls represented the most pressing threats to the spotted owl (USFWS 2012, emphasis added). The Service reports that west-side provinces, including the Olympic Peninsula, scored high on threats from “the negative effects of habitat fragmentation and ongoing habitat loss as a result of timber harvest.” (USFWS 2012, p. 1-8).

The Service also determined the barred owl threat was “extremely pressing and complex, requiring immediate consideration.” (USFWS 2012, p. 1-8, emphasis added). Barred owls compete directly with spotted owls for habitat and resources for breeding, feeding, and sheltering. Research has shown that spotted owl occupancy and colonization rates decreased as barred owl presence increased and available habitat decreased (Dugger et al. 2011). The Service determined that the need to conserve and restore large areas of contiguous, high quality habitat across the range of the owl has intensified as a result of competitive pressure from barred owls (Fed Reg. Vol. 77, No. 233, p. 71879). Therefore, the Service recommends “conserving and restoring older, multi-layered forests across the range of the spotted owl.” (USFWS 2012, p. 1-9).

Since owls continue to decline, face a severe threat from barred owls, and are experiencing loss in genetic diversity, the Service also recommends “conserving occupied sites and unoccupied, high-value spotted owl habitat on State and private lands wherever possible.” (USFWS 2012, p. III-51). Retaining spotted owls at existing sites is an effective approach to conserving spotted owls because owls in established territories are likely to be more successful if they remain in those locations (Franklin et al. 2000).

With new knowledge and information related to spotted owl conservation policy, DNR must consider adjustments or revisions to its assumptions, working hypotheses, and landscape management techniques intended to provide demographic support to the Olympic owl population. DNR's failure to incorporate new information is likely to have significant adverse environmental impacts that are not disclosed or considered in the EIS.

3. The OESF Plan does not minimize or mitigate take

Conservation Objectives: The OESF Plan fails to demonstrate how HCP objectives are attained. For instance, the HCP sets an objective of a landscape management that supports “occupancy by successfully reproducing spotted owls that are functional segments of the Olympic Peninsula subpopulation.” But the OESF Plan’s owl section contains no information or analysis on whether or not this objective is being pursued or could be achieved.

Whereas the HCP sets an objective for stands ecologically functioning as “dispersal, foraging, roosting, and nesting habitat for spotted owls,” the OESF Plan’s contains no assessment of the composite of ecological functions in stands modeled as Movement, Roosting, Foraging, Nesting habitat, or any scientific basis for habitat scores used in its analysis. DNR has conducted no field reviews or field verification, so there is no way to know if and how model results correspond to physical conditions on the ground (e.g. owl nesting, owl foraging, etc.) or spotted owl survival and recovery.

The OESF Plan and HCP share an objective of a landscape plan that does not appreciably reduce the chances for owl survival and recovery, but the OESF Plan’s owl section presents no quantitative analysis or scientific evidence that the OESF Plan might meet this objective. What are the owl’s chances for survival and recovery in the OESF? Is it reduced? Is it appreciably reduced?

Modeled vs. Actual: In modeling acres of spotted owl habitat, the DNR assigned each landscape an impact rating based on the projected change in habitat amount. However, the rating system is inadequate for evaluating habitat occupancy by successfully reproducing owls, or owl chances of survival and reproduction.

In modeling acres for spotted owl movement, roosting, foraging, and nesting, DNR provided no information or analysis how a minimum score of 50 specifically relates to owl habitat function as roosting, nesting, foraging or dispersal habitat.

In modeling spotted owl territories or home ranges, the OESF Plan allocated 7,400 acres for a spotted owl home range and allows 25% overlap among home ranges – as a result, modeled owl home ranges were 5,550 acres. The median size of annual home range for a real spotted owl on the Olympic peninsula is 12,424 acres (Forsman et al. 2007), two and a quarter times larger than DNR’s modeled owl home range. While there is evidence of owl home ranges overlap in the Olympics, researchers emphasized it should not be misconstrued as a recommendation to manage owls based only on “core” areas. In particular, lands managed for owl survival and reproduction, such as the OESF, management “should be based on amounts of habitat within the entire home-range areas ... not just core areas.” (p. 375 *in* Forsman et al. 2005).

The OESF Plan and EIS must use best available scientific information in evaluating and disclosing impacts to spotted owls and its habitat. Modeling inputs for owl home range size vastly overestimate the OESF’s potential owl contribution to the Olympic population and vastly underestimate the probability of significant adverse environmental impacts, introducing uncertainty about the scientific rigor of data and assumptions in other models used in the OESF analysis. While the DNR has compiled a bit of information on stands which may serve as different types of owl habitat, it provides no analysis on how these stands function in concert as a

whole on the landscape to shape owl survival and recovery. As a result, impacts to spotted owls are not disclosed by the OESF Plan and EIS but are likely to be significant and adverse.

#### Owl Nest Sites:

The Service recommends conserving occupied sites and unoccupied high-value spotted owl habitat on State and private land wherever possible because of persistent owl declines, severe threats from barred owls and loss of genetic diversity. (USFWS 2012, p. III-51). The OESF Plan must incorporate new scientific and policy information and conserve occupied owl sites and unoccupied high-value spotted owl habitat on the OESF. Retaining spotted owls at existing sites is an effective approach to conserving spotted owls because owls in established territories are likely to be more successful if they remain in those locations (Franklin et al. 2000).

Protecting owl sites and high-value (structurally complex, nesting/roosting/foraging) habitat is entirely compatible with the OESF. Although the OESF has a goal of unzoned forest, it emphasizes that the distinction between zoned and unzoned is not absolute “because there is a physical and biological zonation in forest landscapes that must be respected and that links directly to the processes and functions that the OESF seeks to understand.” (HCP, p. IV-81). Based on new information regarding the importance of existing owl sites and high-value owl habitat to owl survival and recovery, the OESF Plan must consider protecting this habitat. If these areas are not protected, the EIS must evaluate impacts to owl survival and recovery, which are likely to be significant and adverse.

The OESF Plan aims to log between 33,000 and 160,000 acres of owl nest sites on the OESF, but makes no effort to evaluate impacts of logging nest sites on meeting HCP and OESF conservation objectives, including demographic support to the Olympic owl population. Since DNR lacks surveys, impacts to occupied owl sites and unoccupied high-value habitat are unknown and not disclosed in the EIS.

#### Spatial Distribution of Habitat

While the EIS does provide some information on the quantity of forest types that are predicted by various DNR models, it does not indicate how the shift of habitat patterns in the landscape units over time affects HCP objectives for spotted owl survival and recovery.

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 interior 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).

The distribution of habitat, including patch size, patch isolation or connectivity, and edge contrast, have profound effects on wildlife (Diaz and Apostol 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.

The OESF Plan anticipates increased edge effects (p. 3-195) and increased habitat fragmentation (e.g. decreased patch size of interior forest conditions (p. 3-196); increased abundance of small 100 to 250 acre patches (p. 3-197)), but makes no effort to evaluate impacts to spotted owl from these well-recognized threats.

Failure to provide information on the distribution of owl habitat over time, to ensure sufficient interior forest conditions for spotted owl demographic support 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 OESF 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.

DNR treats threshold proportions (20/40) as targets, despite HCP direction that thresholds are not intended to be targets but minimum standards (HCP, p. IV.88). The HCP anticipated that DNR management would result in sufficient 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 Plan predicts that the OESF landscape will have only 26% of structurally complex forest by 2100 (Chart 3-11, p. 3-41). Furthermore, the OESF Plan proposes logging between 3,300 and 16,300 acres of quality owl habitat from owl nest sites on the OESF, despite the fact that owl nest sites are most likely to be re-occupied by recovering spotted owl populations. Managing to threshold targets is likely to further imperil northern spotted owls.

Under either Alternative in the OESF 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, including nest sites, in the OESF landscape will contribute to spotted owl conservation. Given the habitat loss is a major threat to spotted owl conservation, the OESF Plan will probably appreciably reduce chances of survival and recovery of the northern spotted owl population on the Olympic peninsula and foreclose options for ecosystem support provided by older forests.

As a result, the OESF Plan is incompatible with the HCP. 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.

#### Barred owls:

Barred owls pose an immediate threat to spotted owl conservation. Barred owls compete directly with spotted owls for habitat and resources for breeding, feeding, and sheltering. Research has shown that spotted owl occupancy and colonization rates decreased as barred owl presence increased and available habitat decreased (Dugger et al. 2011).

Prediction of stable owl populations in the Olympics by Hauthausen and others (1995) is undermined by barred owl competition.

The OESF Plan acknowledges increasing population size and threats from barred owl including exclusion and displacement of spotted owls by barred owls (Gremel 2008) and negative effects on northern owl survival on the Olympic peninsula (Anthony et al. 2006), but makes no effort to adjust management activities or evaluate ongoing and future impacts on spotted owls from barred owls.

DNR's contention that evaluating impacts of competition is not feasible (p. 3-221) lacks credibility given the numerous analysis of barred owl effects on spotted owls (see e.g. Forsman et al. 2011; Anthony et al. 2006).

The OESF 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.

#### Summary:

When the DNR HCP was adopted, it launched a unique project at the Olympic Experimental State Forest. It proposed an experiment and crafted a strategy for integrating protection and conservation across the landscape, based on science and policy of the time. As an experiment, systematic application of new knowledge is a core purpose.

One OESF goal for spotted owls is landscape management for demographic support: "occupancy by successfully reproducing spotted owls that are functional segments of the Olympic Peninsula subpopulation." Several factors affect this goal, including the spatial distribution, size and connectivity of habitat holding successfully reproducing owls and the scale and impacts of owl threats. While a jumbled 20/40 habitat scheme may have appeared to provide for owl survival and conservation in 1997, a rich body of scientific literature developed since then, including analytical techniques, related to spotted owl biology and demographics, indicates that is no longer the case.

The OESF Plan operates on the premise that DNR's only obligation to owl conservation is defined by the working hypotheses and other HCP script. Given the OESF's experimental design and adaptive management approach, DNR's interpretation is not sound. Even if it were, DNR cannot ignore or fail to evaluate in its EIS the rich trove of biological information related to owl biology, demographics and recovery that has been produced since 1997.

The failure to consider and apply best available science informing OESF owl conservation, including barred owl incursion, extreme weather events associated with climate change, importance of nest sites and high-value habitat, landscape habitat patterns and function, the draft salvage logging procedure, proposed changes to habitat definitions, and other factors strongly shaping owl survival and recovery and demographic support of the Olympic owl population, in association with plans to increase fragmentation, degrade, and destroy owl habitat, including nest sites, will have a probable significant adverse environmental impact that was not disclosed in the EIS.

Based on available scientific information, the OESF Plan will considerably reduce chance of owl survival and recovery and not provide demographic support to the Olympic owl population.

Citations provided upon request.

## Marbled Murrelets

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### Introduction

Across their range in the Pacific Northwest, populations of the federally threatened marbled murrelet (*Brachyramphus marmoratus*) have continued to decline since their listing in 1992 (USFWS 1992, 1997), the implementation of the Northwest Forest Plan in 1994 (USDA and USDI 1994), and the implementation of the DNR State Trust Lands Habitat Conservation Plan in 1997 (“HCP”; WDNR 1997). In Washington State, the most recent estimate of the annual rate of decline in marbled murrelet density is -4.07% (from 2001-2012;  $p = 0.026$ ;  $SE = 0.192$ ; Lance et al. 2012). Current and historic loss and fragmentation of nesting habitat are the primary factors responsible for this decline (USFWS 1992, Nelson and Hamer 1995, McShane et al. 2004, Miller et al. 2012).

The extent of marbled murrelet habitat loss on nonfederal lands is staggering. In a single decade (1996-2006), roughly 243,500 acres (30%) of higher suitability nesting habitat was lost on nonfederal lands in Washington State, and 94% of this loss was due to timber harvest (Raphael et al. 2011). On nonfederal lands of the Olympic Peninsula, approximately 51,800 acres (27%) of higher suitability habitat was lost during this decade, 93% of which was due to timber harvest. The scientists who conducted these analyses warn that “conservation of the threatened murrelet is not possible if such losses continue at this rate into the future” (Raphael et al. 2011).

Marbled murrelet habitat fragmentation leads to increased rates of nest predation and negative changes in microhabitat quality. Malt and Lank (2007) found that marbled murrelet nest predation was highest adjacent to clearcuts and young regenerating forests due to an increased abundance and diversity of predators (corvid species such as jays, ravens, and crows) at “hard edges”. On average, approximately 43-85% of nests fail and 78% of these nests failed because of predation (reviewed by McShane et al. 2004). Ongoing loss of quality nesting sites accompanied by increased nest predation where remaining nesting habitat is fragmented have resulted in sustained low recruitment of juveniles into the population (McShane et al. 2004, Malt and Lank 2007, USFWS 2012). This trend cannot be reversed until the loss and degradation of habitat are reversed.

For the reasons outline above and as required by the State Trust Lands HCP, a Science Team of marbled murrelet experts was commissioned by the DNR to design a Long Term Conservation Strategy (“LTCS”) for marbled murrelet to make a significant contribution to maintaining and protecting the population (“Science Report”, Raphael et al. 2008). The DNR is still in the process of developing the LTCS for all six HCP planning units within the range of the marbled murrelet (including the OESF) with draft Alternatives expected in early 2014 and a DEIS expected in the fall of 2014 (per DNR report to BNR on Dec. 3, 2013). The Science Report should serve as the foundation for the LTCS and the OESF Forest Land Plan (“FLP”) because it was designed precisely to help meet the recovery objectives of the HCP. The Science Report describes in detail how to manage marbled murrelet nesting habitat to contribute to 1) a stable or

increasing population; 2) an increasing geographic distribution; and 3) a population that is resilient to disturbance.

#### Science Team Recommendations for the OESF

The DNR manages the “unzoned” OESF for multiple objectives at the scale of ecologically similar, midsized Landscape Planning Units (“LPUs”) based on watershed boundaries (Fig. 1). The eleven LPUs vary widely in their ability to support and grow the marbled murrelet population in the near term. In general, “areas that will be managed for contiguous blocks of old forest will provide a higher contribution than areas where ownership patterns or management policies result in smaller patches of habitat” (Raphael et al. 2008, p. 3-35). The conservation strategy recommended by the Science Team includes a combination of deferral and buffering of known nesting habitat across all LPUs and active management of non-habitat in strategic locations to accelerate its restoration in large contiguous blocks where the negative edge effects of nest predation are minimized. More specifically, the Science Team recommends for all LPUs that DNR:

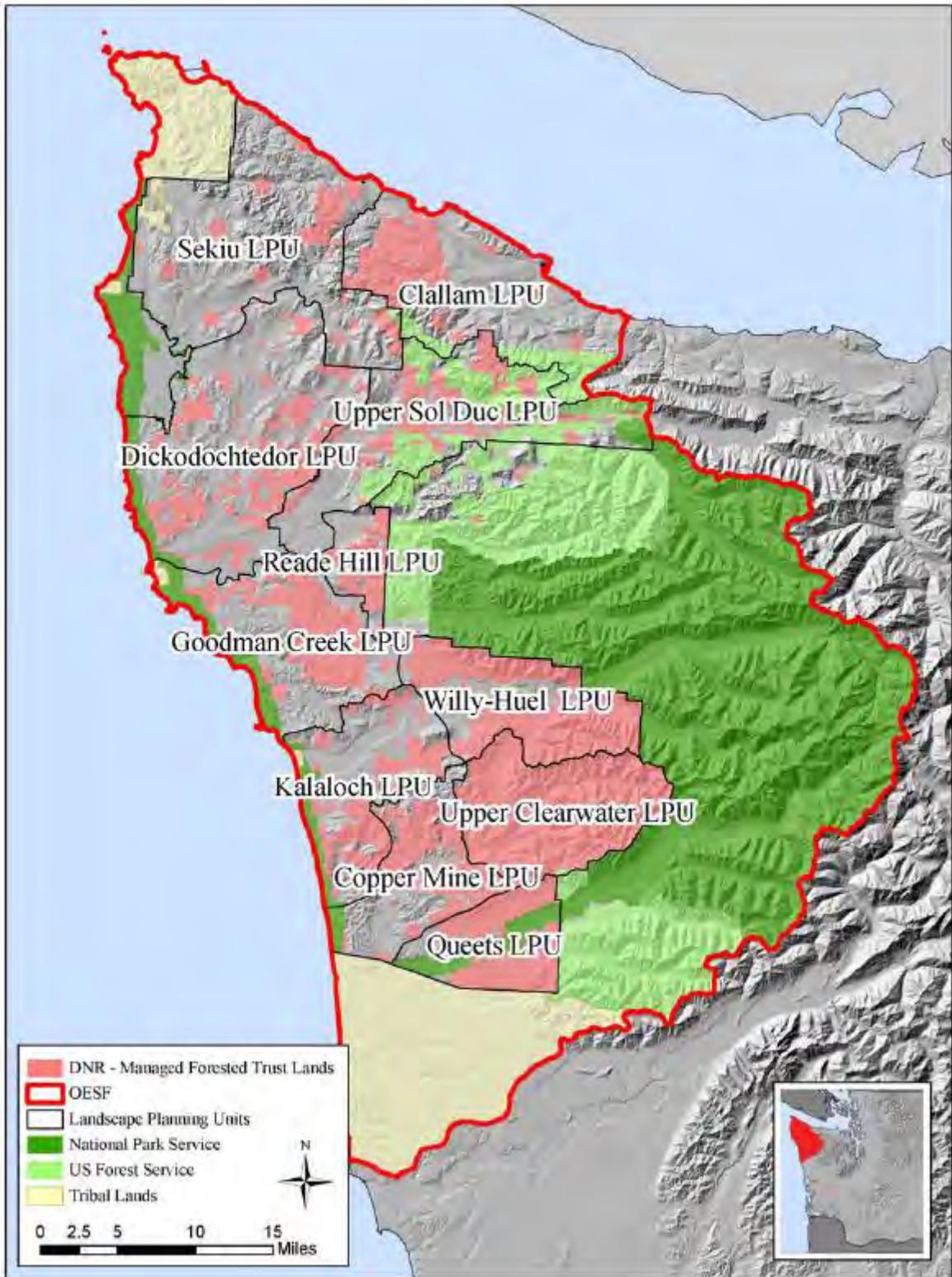
- Defer from harvest existing old forest stands and occupied sites.
- Manage a buffer area within 328 feet (100 meters) of existing old forest stands and occupied sites to provide conservation benefits to existing high-quality nesting habitat.
- Achieve pole-sized or better structure over 100% of the area of a 328 feet (100 meters) buffer around designated occupied and older forest sites.
- Manage riparian and unstable slope areas according to the HCP to provide additional marbled murrelet nesting habitat.
- Minimize disturbance during the critical nesting season (1 April through 31 August) including observing daily peak activity periods for marbled murrelet (one hour before sunrise to two hours after; one hour before sunset to one hour after; WAC 222-16-010).

In the four LPUs where the greatest contributions to marbled murrelet conservation can be made on DNR lands (Queets, Dickodochtedor, Goodman Creek, and Kalaloch LPUs) the Science Team recommends that DNR:

1. Designate Marbled Murrelet Management Areas (“MMMAs”) within DNR-managed lands.
2. Defer harvest in specific areas within the MMMAs including:
  - a. Designated stands of old forest
  - b. All surveyed habitat
  - c. All occupied habitat
3. Manage the MMMAs to achieve and maintain at least 50 percent of the area as high-quality nesting habitat.

The MMMAs were designated in an ecological type that is not well-represented on federal lands. In the low-elevation Sitka spruce zone (Franklin and Dyrness 1988) of the OESF, it is unlikely that substantial marbled murrelet habitat capability will be restored on other landownerships. DNR’s marbled murrelet conservation efforts in this zone are disproportionately important and have the greatest potential to contribute to a resilient and better distributed marbled murrelet population. In order to minimize negative fragmentation effects, the MMMAs were designated adjacent to federal lands or in areas with

a high density of DNR-managed lands away from areas of higher human impact with enriched corvid populations.



**Fig. 1.** OESF Landscape Planning Units and major landowners (Raphael et al. 2008).

On a coarse scale, the Science Team determined the most appropriate marbled murrelet conservation objective for each LPU. On a finer scale, the Science Team made specific landscape design and management recommendations customized for each LPU. These are all detailed below (Raphael et al. 2008, p. 3-37 – 3-56):

**1. Conservation through existing policy and procedure model**

- a. For LPUs with large contiguous blocks of DNR-managed lands adjacent to large federal reserves at middle to upper elevations (Upper Clearwater and Willy-Huel LPUs).
- b. Remaining habitat will be managed according to broad DNR policies and procedures, including commitments for northern spotted owl (*Strix occidentalis caurina*) and riparian conservation.

**2. Intermediate approach for smaller landscapes**

- a. For smaller LPUs at generally lower elevations with less, but still significant, amounts of old forests.
- b. Reade Hill LPU
  - i. Remaining habitat adjacent to existing old forest stands will be deferred from harvest or managed to accelerate development of old forest northern spotted owl habitat, based on the assumption that this also provides good marbled murrelet habitat.
  - ii. Remaining habitat not identified will be managed according to broad DNR policies and procedures, including commitments for northern spotted owl and riparian conservation.
- c. Queets LPU
  - i. Some stands of old forest were possibly misclassified. If review of these stands finds them not to be old forest (according to DNR's old-growth index, HCP definitions for old forest owl habitat, or other approved procedure), they will be managed according to broad DNR policies and procedures.
  - ii. The area within one mile of Olympic National Park will be managed as an MMMA. Habitat within the MMMA will be deferred from harvest or managed to accelerate development of old forest northern spotted owl habitat, based on the assumption that this also provides good marbled murrelet habitat.
  - iii. Two-thirds of the remaining area within the MMMA will be managed to be in stands with the tallest 40 trees per acre at least 80 feet tall.
  - iv. Remaining habitat outside the MMMA will be managed according to broad DNR policies and procedures, including commitments for northern spotted owl and riparian conservation.
- d. Copper Mine LPU

- i. Remaining habitat will be managed according to broad DNR policies and procedures, including commitments for northern spotted owl and riparian conservation.

### **3. Intermediate approach for the northern landscapes**

- a. For LPUs with very little old forest remaining at lower to middle elevations that vary in the size of DNR-managed blocks and their adjacency to federal reserves.
- b. Upper Sol Duc LPU
  - i. Designated stands of habitat (Figure 3-20) will be deferred from harvest or managed to accelerate development of old forest northern spotted owl habitat, based on the assumption that this also provides good marbled murrelet habitat.
  - ii. Remaining habitat not designated will be managed according to broad DNR policies and procedures, including commitments for northern spotted owl and riparian conservation.
- c. Clallam and Sekiu LPUs
  - i. Remaining habitat will be managed according to broad DNR policies and procedures, including commitments for northern spotted owl and riparian conservation.

### **4. Emphasis on Marbled Murrelet conservation model**

- a. For LPUs in the Sitka spruce zone with some existing old forest with MMMA designated adjacent to federal lands or in areas with a high density of DNR-managed lands to limit potential negative fragmentation effects (Dickodochtedor, Goodman Creek, and Kalaloch LPUs).
- b. MMMA are intended to provide abundant high-quality nesting habitat in a minimally fragmented context. Each MMMA will be managed to achieve and maintain at least 50 percent of the MMMA (maximizing interior area) in habitat, and maintain at least 2/3 of the remaining areas in stands with the tallest 40 trees per acre at least 80 feet tall.
- c. Remaining habitat within MMMA will be deferred from harvest or managed to enhance their potential as marbled murrelet nesting habitat.
- d. Remaining habitat outside MMMA will be managed according to broad DNR policies and procedures, including commitments for northern spotted owl and riparian conservation.

The Science Team conducted a modeling exercise to evaluate the potential for current and projected future marbled murrelet habitat to “make a significant contribution to maintaining and protecting marbled murrelet populations in western Washington over the life of the HCP” (DNR 1997, p. IV.44).

Their key results were:

1. DNR plays a large role among major landowners in addressing population size and distribution objectives.
2. Habitat develops over time with more habitat capability in higher quality habitat.

3. High-quality habitat develops faster in the MMMAs when they are actively managed versus unmanaged.
4. Higher quality habitat develops faster inside MMMAs than outside MMMAs on DNR lands.

Significant progress toward the three biological goals for the LTCS (driven by the objectives of the HCP) can be made if the detailed management recommendations of the Science Team are followed. In the OESF specifically, the management strategies recommended by the Science Team are expected to result in a 28% increase in population size (as measured by habitat capability), a more stable population due to increased interior habitat, improved ecological distribution, and improved resilience.

It is important to note that “The Science Team assumes that the areas protected under the other conservation strategies will remain protected throughout the life of the HCP. The Science Team recommends that, if other conservation strategies change such that they discontinue benefits to the marbled murrelet, policy be updated to maintain protection of areas important to the marbled murrelet” (Raphael et al. 2008, p. 3-34). In other words, if commitments for the northern spotted owl and riparian conservation on DNR lands are weakened in the OESF FLP, they must not include compromises to the integrity of important marbled murrelet habitat areas.

#### Additional Recommendations for the OESF FLP and LTCS

A collection of Conservation Groups has crafted a conservation alternative for the LTCS that builds upon the Science Report and is consistent with DNR’s trust obligations and the Needs, Purpose, and Objectives of the LTCS (“Alternative 4”; Attachment 1)<sup>8</sup>. Alternative 4 makes the following recommendations in addition to those outlined in the Science Report:

1. New protocol surveys (Evans Mack et al. 2003) of any reclassified or other high quality habitat prior to it being released for harvest to ensure it is in fact unoccupied by murrelets.
2. Limit disturbance in a 0.25 mile radius around occupied sites during the breeding season. Breeding season timing is defined in the most up-to-date Pacific Seabird Group survey protocol as 1 April – 15 September.
3. Redelineate MMMAs as needed to account for harvest since the completion of the Science Report, using habitat suitability model output (Raphael et al. 2011) to incorporate existing habitat, stands that are close to habitat condition, or simply structured mature forest that can act as a buffer.

The Conservation Groups requested that the DNR and the USFWS first evaluate the proposed conservation alternative in the draft EIS for the LTCS and then ultimately adopt it as the LTCS for the marbled murrelet.

#### OESF Interim Guidance Memo

Because the development of the OESF FLP is further along than the LTCS, DNR does not propose and analyze two alternatives for marbled murrelet management in the RDEIS and FLP. Rather, DNR simply

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<sup>8</sup> July 1, 2013 letter from the Washington Forest Law Center to the DNR and USFWS re. File No. 12-042001; comments on the scope of the draft environmental impact statement (phase two), including the proposed conceptual alternatives, for the long-term marbled murrelet conservation strategy.

makes a reference to an existing Memorandum on Marbled Murrelet Management within the OESF ("Memo", dated March 7, 2013) which directs implementation of the HCP marbled murrelet Interim Conservation Strategy (RDEIS App. F). DNR states that the final FLP must enable DNR to meet the management objectives outlined in the Memo until the LTCS has been completed and adopted. The primary protective measures outlined in the Memo are:

- Defer from harvest all occupied marbled murrelet sites, reclassified habitat, old forest and science team additional habitat.
- Evaluate occupied sites and unsurveyed old forest for the application of buffers and timing restrictions from adjacent management activities when appropriate.
- Evaluate the application of a buffer for any proposed harvest activities within 328 ft. (100 m) of and timing restrictions for noise disturbing management activities within 0.25 miles of an occupied site or unsurveyed old forest.
- Within occupied sites, new road construction is not permitted. Road reconstruction or road abandonment involving the felling of trees >6" dbh may be permitted with prior Division review.
- Within old forest, reclassified habitat or Science Team Additional Habitat new road construction, reconstruction or maintenance involving the felling of trees >6" dbh may be permitted with prior Division review.

#### Inconsistencies between the Science Report, Alternative 4, and the OESF Memo

Major discrepancies exist between the policy the DNR intends to keep in place until the completion of the LTCS (the OESF Memo) and the policy based on the best available science (the Science Team Report supplemented by Alternative 4). Unlike the Science Team recommendations, the OESF Memo:

1. Treats all eleven LPUs exactly the same despite wide variability in their ability to support and grow the marbled murrelet population,
2. Makes occupied site buffers and timing restrictions from adjacent management activities optional, meaning they may not exist at all in places despite
3. Makes no effort to block up or restore habitat in MMMAs despite the clear conservation benefits of doing so, and
4. Does not call for any new protocol surveys despite documented inadequacies with former survey efforts (though this is mitigated for by deferring all occupied marbled murrelet sites, reclassified habitat, old forest and science team additional habitat regardless of survey status).

The inconsistencies outlined above may have dire consequences for the marbled murrelet population of the OESF because the OESF Memo fails to help meet the recovery objectives of the HCP and contribute to a stable or increasing population, an increasing geographic distribution and a population that is resilient to disturbance. This problem was foreseen by USFWS two and a half years ago, in a letter from Ken Berg to DNR's Commissioner Goldmark (June 7, 2011) excerpted below (emphases added):

"It is imperative that...trust lands timber sales not foreclose conservation options while the long-term strategy is completed."

“We expect that any acceptable long-term strategy proposed by DNR and approved by the Service will achieve the purposes of the proposed Marbled Murrelet Management Areas (MMMAs).”

“While we do not consider that the MMMA’s proposed in the Report are the only possible approach for an acceptable long-term strategy, it is very important that DNR not preclude this conservation option while the long-term strategy is completed. Similarly, DNR should not foreclose the option of achieving long-term murrelet conservation in the OESF by applying the [Science Team] Report’s recommendations for the LPU’s.”

“DNR would be in continued compliance with the HCP if:

- 1) DNR completes the long-term strategy in all planning areas by the end of 2013;
- 2) Timber sales, and other activities, conducted from 2011 to 2013 do not:
  - a) foreclose long-term strategy conservation options, within the proposed MMMA’s and OESF LPU’s; or
  - b) deviate from the other requirements of the current interim strategy.
- 3) DNR conducts restoration forestry projects within the proposed MMMA’s to accelerate murrelet habitat recovery, where feasible.”

### Conclusions

It is clear that implementation of the OESF Memo as written will preclude conservation options for the LTCS. The OESF Memo could be implemented for another two years or more, further degrading marbled murrelet habitat conditions that will take many decades to restore. Given the poor population status, an interim policy must be stronger, not weaker than the status quo. Thus it is imperative that the OESF Memo and FLP be amended to fully reflect the Science Report or at a minimum:

1. Require 328 foot (100 meter) buffers around all occupied sites and old forest,
2. Require timing restrictions from adjacent management activities in a 0.25 mile radius around occupied sites during the breeding season (1 April – 15 September),
3. Designate MMMA’s as defined by the Science Team and begin to restore habitat within them, and
4. Provide opportunities adjacent to MMMA’s to mitigate for harvest in MMMA’s since the completion of the Science Report.

Unfortunately, the landscape patterns which result from the experimental “integrated management” approach of the OESF are likely to perpetuate the decline of the marbled murrelet. DNR describes: “What makes the integrated management approach unique is that deferrals, riparian management zones, and other areas that primarily support ecological values are interspersed with more actively managed areas, not consolidated in large blocks (OESF FLP RDEIS, p. 72, emphases added).” This is the opposite of the habitat configuration needed to ameliorate high marbled murrelet nest predation rates and low juvenile recruitment. A long term shifting mosaic model consistent with integrated

management may not allow for successful maintenance and dispersal of species with high site fidelity like marbled murrelets and northern spotted owls until their populations are much closer to recovery.

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**PART III: ADDITIONAL ANALYSIS**

# Fiduciary Duty

Peter Goldman

## I. Purpose of Comment:

In Appendix A to the OESF Forest Land Plan, DNR includes a section describing the State Trust Lands in general. See Draft OESF Forest Land Plan, App. A., at pg. 9. In this section, however, DNR makes a serious error in its description of the State Forest Lands, the forests identified in RCW 79.02.010 (13). DNR equates, legally and managerially, the State Forest Lands with the State Lands (the forests identified in RCW 79.02.010 (14)). DNR writes that “The Legislature directed that these [State Forest] lands be held and managed in trust, **the same as State Lands**. App. A., pg. 9 (2<sup>nd</sup> bullet)(emphasis added). DNR also writes that, “The Washington State Legislature, as trustee, requires the Board of Natural Resources and DNR, as the trust land manager, to establish policies to ensure that, based on sound principles, trust assets are managed for sustainable benefit to the trusts in perpetuity.” App. A., pg. 9-10.

These are completely **incorrect** characterizations of the State Forest lands because these characterizations imply that the State **Forest** Lands must be managed under the same fiduciary standards as are the State Lands. In fact, the Legislature did **not** direct DNR to manage the State Forest Lands the “same as” the State Lands. On the contrary, the Legislature directed that DNR manage the lands received from the Counties (the State Forest Lands) in the same manner as “other **state forest lands**,” RCW 79.22.040 (emphasis added), which are different than the “state land” forests. Moreover, DNR must not manage the “state forests” in the best interest of the beneficiaries but “in the best interest of the State.” RCW 79.22.050.

We explain this important distinction below. We ask DNR to correct its confusion and conflation of its fiduciary duties relative to the federal land grant lands with its duties relative to the State forest lands in the OESF landscape plan EIS.

## II. **History of the State Forest Lands (as Defined in RCW 79.02.010(13)).**

The State of Washington today owns and DNR manages approximately 2.1 million acres of forest lands.<sup>9</sup> These forests fall into two categories pertinent to this White Paper: approximately 3 million acres were granted to the State of Washington by the federal

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<sup>9</sup> 2012 DNR Annual Report, at 39.

government at statehood; these lands are commonly referred to as the state “school lands” or the “State Grant lands.” These lands were set aside in the 1889 Washington Enabling Act in trust for the common schools, universities, scientific schools, and the normal schools. The Legislature defined the federal land grant forests as “state lands.” RCW 79.02.010 (14). Today, there are approximately 1.5 million acres of Federal Land Grant lands available for timber harvest and they generated approximately \$208 million in revenue for their beneficiaries in 2012.<sup>10</sup>

Another category of DNR managed forests are the “**State Forest Lands**,” as defined in RCW 79.02.010 (13). The 618,573 acres of State Forest Lands<sup>11</sup> were transferred to the state by 21 Washington counties in the 1920s and 1930s as a result of county tax foreclosures, gifts, and purchases.

The State Forest Lands came into existence as a result of irresponsible logging on private land that left the Counties with massive unpaid tax bills. They also came into existence because of the State’s urgent need to restore the aesthetic, recreational, environmental, and economic benefits of intact forestland. This history is important because it is the context for the Legislature’s creation of the statutory trust that governs DNR’s management of the State Forest Lands.

Washington’s first settlers encountered vast old growth forests. The towering conifer forests of the Washington Territory allowed many to believe that Washington’s forests were inexhaustible. But soon that belief faded and by the 1920s, Washington’s title of “the Evergreen State” was starting to sound ironic. “Washington’s forests were disappearing, just as the forests of Wisconsin and Michigan had vanished in the 19th century. There were no reforestation programs, and fire control was minimal or nonexistent.”<sup>12</sup> Forestland owners had reduced the lush forests that once graced the landscape to mile-after-mile of scoured and stripped land.<sup>13</sup>

Washington’s denuded landscape was more than just an eyesore. Wildfires often raced through the slash, risking life and property nearby, and leaving behind a strange, barren

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<sup>10</sup> 2012 DNR Annual Report, at 45, 71.

<sup>11</sup> 2012 DNR Annual Report, at 59.

<sup>12</sup> Daniel Jack Chasan, *A Trust for All the People: Rethinking the Management of Washington's State Forests*, 24 Seattle U. L. Rev. 1, 6 (2000).

<sup>13</sup> *Id.*

landscape of charred stumps.<sup>14</sup> “Denuded hillsides . . . made possible the rapid runoff of surface waters, thus increasing the dangers from floods and contributing to costly soil erosion.”<sup>15</sup>

Regrettably, the business strategy of many of Washington’s early forest landowners was “cut out and get out.”<sup>16</sup> After clearing the land of timber, these landowners abandoned the land (which were then devoid of economic value) and stopped paying their property taxes.<sup>17</sup> Eventually, the counties acquired these forests through tax foreclosure.<sup>18</sup>

The Legislature eventually recognized that something needed to be done to reforest these lands and that the counties were ill-equipped to do the job. During the 1920s and 1930s, “reforestation” became the rallying cry. As the Washington Supreme Court noted:

We are aware that the problem of our vanishing forests and the reforestation of the vast areas from which the timber has already been removed has challenged the attention, not only of the people of this state, but of the nation, and everywhere efforts are under way, through plans for a more orderly harvesting of timber crops and the planting of denuded areas, to remedy, in part at least, the wasteful practices of the past.<sup>19</sup>

Reforestation was seen as a panacea for a host of ills because forests provided a number of tangible benefits, such as anchoring soil, slowing water runoff, and providing a source of future timber. A 1931 Seattle Times editorial even praised Washington’s reforestation efforts for aesthetic reasons:

Although there are sound economic reasons for perpetuating Washington’s magnificent forests, the idea that woodlands have an aesthetic and education values is taking hold of the public though here and elsewhere. The great movement for . . . reforestation of denuded hillsides is based upon the recreational and educational value rather than upon their possible commercial importance . . . . Bare hillsides or blackened stump areas where fires have raged fill the average person with a feeling of horror or regret. If there were no economic reasons for reforesting the land it would

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<sup>14</sup> *Id.*

<sup>15</sup> *State v. Dexter*, 32 Wash. 2d 551, 555-56 *aff’d*, 338 U.S. 863 (1949).

<sup>16</sup> *Id.*

<sup>17</sup> *Id.*

<sup>18</sup> *Id.*

<sup>19</sup> *State ex rel. Mason Cnty. Logging Co. v. Wiley*, 177 Wash. 65, 71 (1934).

be well worth while to bring back the beauty of the American landscape.<sup>20</sup>

The Legislature took a number of steps to promote reforestation. In 1921, the Legislature authorized the State to acquire by purchase or gift any lands suitable for reforestation and to “seed and develop forests” on such land.<sup>21</sup> In 1923, the Legislature created the State Forest Board—the predecessor to today’s DNR—to manage the state forest lands and authorized the Board to issue bonds, up to \$200,000, to acquire and reforest these lands.<sup>22</sup> Lands purchased by the state were “forever reserved from sale,” but timber from these forests “may” be sold.<sup>23</sup> At that time, the Legislature created a trust relationship between the State and the counties, but granted the State significant discretion in managing the trust, requiring that: “timber and other products thereon may be sold or the said lands may be leased in the same manner and for the same purposes as is authorized for the state granted lands, except that no sale of any timber or other products thereon and no lease of said lands shall be made until ordered and approved by the State Forest Board.”<sup>24</sup> In 1927, the Legislature authorized DNR to acquire county lands received through tax foreclosure for the purpose of reforestation and incorporated by reference the management standards in the 1923 law.<sup>25</sup>

Twenty-one counties quickly transferred their barren and burdensome former forest lands to the State.<sup>26</sup> This transaction ultimately benefited both the State and the counties. Not only would the county and its junior taxing districts receive revenue if and when timber was sold, but all parties, the state and the county, would benefit from reforestation and the preservation of Washington’s forest resources. In 1955, the Legislature amended the language of the statutory trust to clarify that the State’s interests were paramount. The Legislature specifically directed DNR to manage the State Forest Lands in the same manner as the Federal Land Grant Lands but only “if the board finds such sale or lease to be in the best interests of the state and approves the terms and conditions thereof.”<sup>27</sup> Very similar language persists today in RCW 79.22.050.

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<sup>20</sup> Seattle Times, July 12, 1931.

<sup>21</sup> 1921 Wash. Laws ch. 169.

<sup>22</sup> 1923 Wash. Laws ch. 154.

<sup>23</sup> *Id.*

<sup>24</sup> *Id.*

<sup>25</sup> 1927 Wash. Laws, ch. 288, §3-b.

<sup>26</sup> DNR, POLICY FOR SUSTAINABLE FORESTS 12 (Dec. 2006) [hereinafter “Policy for Sustainable Forests”].

<sup>27</sup> 1955 Wash. Laws, ch. 116.

**III. Unlike the Federal Land Grant Lands, DNR has substantial discretion over its management of the State Forest Lands; DNR must plan for and manage State Forest Lands “in the best interests of the state,” not necessarily in the exclusive best interest of the county and junior taxing district beneficiaries of these forests.**

The threshold question in this White Paper is whether the Washington Supreme Court’s decision in *County of Skamania v. State*, 102 Wn.2d 127, 685 P. 2d 576 (1984) (“*Skamania*”) requires DNR to plan for and manage the State Forest Lands as private trusts, the way DNR currently manages the Federal Land Grant lands. We conclude, as did the Attorney General in A.G.O. 11, at 58, the answer is **no**.

In *Skamania*, the Washington Supreme Court held that when selling timber harvest rights, DNR must manage the federal land grant forests (“public lands” as defined in RCW 79.02.010 (14)) under the general principles applicable to private trusts. *Skamania*, 102 Wn.2d at 132. The Court thus held that DNR had a legal obligation to manage these lands with undivided loyalty and prudence towards the trust beneficiaries. *Skamania*, 102 Wn.2d at 134-39. The Court went on to hold that the Legislature had violated this fundamental trust principle by enacting the Forest Products Industry Recovery Act, legislation that relieved timber companies of their contractual obligation to purchase state-owned forests at higher-than-market prices which they agreed to pay at public auction.<sup>28</sup>

*Skamania*’s private trust rationale, however, does *not* apply to the State Forest lands. In RCW 79.22.040, the Legislature directed DNR to manage the Forest Board Lands in the same manner as the “State forest lands.” The State Forest Lands, however, are *not* legally the same as the federally granted “state lands” identified in RCW 79.02.010 (14)(a); they are a different category of State-owned forests set forth in RCW 79.02.010 (13). DNR holds these forests in statutory, not common law, trusts. A.G.O. 11, at 58. Moreover, RCW 79.22.050 requires DNR to manage these lands “in the best interests of the State.” This means that management of the State Forests that is in the *State*’s best interest may not necessarily be in the best financial

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<sup>28</sup> The authors and signees of this White Paper do *not* concede that *Skamania* was correctly decided to the extent it held that the federal land grants created private trusts. On the contrary, we believe that the federal land grants created *public* trusts. 1996 A.G.O. 11, at 10 itself acknowledged these countervailing arguments and Conservation Northwest made this argument in an extensively researched Motion for Summary Judgment in *Skagit County v. State of Washington*, Skagit County Superior Court No. 05-2-00246-1 (Nov. 2006). See also Chasan, A Trust for all the People: Rethinking the Management of Washington’s State Forests, 24 Seattle U. L. Rev. 1 (2000); John B. Arum, Old Growth Forests on State School Lands—Dedicated to Oblivion?—Private Trust Theory and the Public Trust, 65 Wash. L. Rev. 151 (1990).

interest of the specific County or Junior Taxing District beneficiaries of the State Forests. Because the private trust reasoning in *Skamania* is based on the enabling acts of Washington and other states, as well as the language of the Washington Constitution, its reasoning does not apply to the separate statutory trust duties set forth in RCW 79.22.050 .

**A. The State Forest Lands must be managed in the same manner as other purchased or gifted lands, *not* in the same manner as the federally granted lands.**

A trust is a legal relationship where one party holds property for the benefit of another.<sup>29</sup> Three parties are required for every trust: the trust settler, the trustee, and the beneficiary.

According to RCW 79.02.010 (13), the statutory definition of “state forest lands,” the State Forest Lands have three sources: gifts of private land (RCW 79.22.010), deeds of county lands which had been subject to county foreclosure due to non-payment of taxes (RCW 79.22.040), and forests acquired by DNR through purchase that are suitable for reforestation. RCW 79.22.020. In the case of the State Forest Lands, the Legislature was the trust settler—it established the trust and authorized the DNR, under RCW 79.22.040, to acquire forest land from the Counties resulting from county foreclosures against landowners. DNR is the trustee, charged with managing the transfer lands for the benefit of both the state as a whole, and the counties and junior taxing districts which receive the bulk of any timber revenue are the beneficiaries.<sup>30</sup>

In RCW 79.22.040, the Legislature directed DNR to manage the State Forest lands acquired from county foreclosures “in the same manner as other *state forest lands*.” (emphasis added). “State forests” are not, however, the same as the federally-sourced state school lands, the latter of which are defined in RCW 79.02.010 (14). Rather, the “state forest lands” are all non-federal-originating lands. RCW 79.02.010 (13). Because the Legislature in RCW 79.22.040 specifically directed DNR to manage the county lands acquired through tax foreclosures as “state forest lands,” the fiduciary standard applicable to *state forest lands*, not the Federal Land Grant Lands, applies to DNR’s management of these forests. We discuss this standard below.

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<sup>29</sup> Restatement (Third) of Trusts § 2 (2003).

<sup>30</sup> A.G.O. 11, at 60.

**B. RCW 79.22.050 explicitly requires DNR and BNR to find that State Forest programmatic decisions, such as key decisions implementing its HCP, are in the best interest of the State; this may or may not be in the best interest of the specific county.**

DNR's trust mandate, the obligations that govern DNR's management of the State Forest Lands, hinges on the Legislature's intent in creating the statutes governing DNR's management. A.G.O. 11, at 53. When a statutory standard conflicts with a common law standard, the common law gives way and is pre-empted as a matter of law. *Washington Water Power Co. v. Graybar Electric Co.*, 112 Wn.2d 847, 851-56, 774 P. 2d 1199, *modified* 779 P. 2d 697 (1989). Common law trust obligations apply only insofar as they are not inconsistent with statutory provisions. RCW 4.04.010. The trustee's primary duty is to carry out the settlor's (here, the State of Washington's) intent as determined from the terms of the trust instrument. *Austin v. U.S. Bank*, 73 Wn. App. 293, 304 869 P.2d 404, *rev. denied*, 124 Wn. 2d 1015 (1994). Thus, the first place to look to determine DNR's trust mandate and fiduciary land management standard is the statutes governing the State Forest Lands.<sup>31</sup>

Facing the cut, run, and tax defaults described above, in 1927 the Legislature authorized the State to accept barren and burdensome forests from the counties for the purposes of reforestation. RCW 79.22.040.<sup>32</sup> In directing *how* these lands should be managed, the Legislature had a choice: it could require the lands to be managed in the same manner as other forest lands purchased by or gifted to the state *or* in the same manner as the Federal Land Grant Lands. The Legislature clearly chose the former, directing that these transfer lands be held in trust but “be forever reserved from sale, but the valuable materials thereon may be sold or the land may be leased in the same manner and for the same purposes as is authorized for state lands if the department finds such sale or lease to be in the best interests of the state...” RCW 79.22.050 (emphasis added). This is why the Attorney General clearly recognized that the Legislature did *not* require DNR to manage the State Forest Lands in the same manner as DNR manages common law trusts. A.G.O. 11, at 53 (“...[u]nlike the federal grant land trusts, the forest board transfer land trust is created by statute.”); *Id.*, at 54 (“In light of these principles, this

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<sup>31</sup> *Id.* (“[The] terms of the forest . . . transfer lands trust are found in statutes directing the administration and protection of state forest lands. These statutes define the trust relationship and [DNR’s] obligations and authority in administering the trust.”).

<sup>32</sup> 1927 Wash. Laws, ch. 288.

opinion concludes that the legislative authority of the state with respect to forest board transfer lands generally is not constrained by common law fiduciary principles governing administration of private trusts.”); *Id.*, at 58 (“These statutes define the trust relationship and the Department’s obligations and authority in administering the trust.”).

Because DNR holds the State Forest Lands in a statutory not a common law trust, a different fiduciary standard governs DNR’s management of these lands. A trustee must manage a common law trust in the exclusive best interest and in furtherance of the undivided loyalty of the trust beneficiaries, among other fiduciary duties. *Skamania*, 102 Wn. 2d at 137. But the Legislature in RCW 79.22.050 circumscribed this common law trust standard and instead directed DNR to manage these lands *in the best interests of the State*. By its own terms, this management, however, may not necessarily be in the exclusive best interest of the beneficiaries. RCW 79.22.050 provides:

Except as provided in RCW 79.22.060, all land, acquired or designated by the department as state forest land, shall be forever reserved from sale, but the valuable materials thereon may be sold or the land may be leased in the same manner and for the same purposes as is authorized for state lands if the department finds such sale or lease to be in the best interests of the state and approves the terms and conditions thereof. (emphasis added).

In summary, DNR has considerably more latitude planning for and managing the State Forest Lands than it does the Federal Land Grant Lands and DNR is not limited by common law trust duties to the Counties or junior taxing districts. Instead, DNR may manage the State Forests under the same standards state agencies manage its non-trust proprietary properties. A.G.O. 11, at 60-61. This is because agencies acting in an administrative capacity have significantly more discretion than when they act as a trust manager. A.G.O. 11, at 36 (citing Jon A. Souder et al., *Sustainable Resources Management and State School Lands: The Quest for Guiding Principles*, 34 Nat. Resources J. 271, 295 (1994)). DNR is *not* required to administer the State Forest Lands “based on the economic circumstances and interests of each county in which such lands are located.” A.G.O. 11, at 60.

Another statute governing the management of the State Forest lands reflects that the Legislature intended to give DNR substantial discretion over the management of the State Forest Lands unencumbered by common law fiduciary duties. RCW 79.22.070 provides:

State forest lands shall be logged, protected, and cared for in such manner as to ensure natural reforestation of such lands, and to that end the department shall have power, and it shall be its duty to adopt rules, and amendments thereto, governing logging operations on such areas, and to embody in any contract for the sale of timber on such areas, such conditions as it shall deem advisable, with respect to methods of logging, disposition of slashings, and debris, and protection and promotion of new forests.<sup>33</sup> (emphasis added)

This statute demonstrates DNR has discretionary management authority and must explicitly find that logging is in the best interests of the State. The Legislature’s use of the word “shall” indicates that DNR *must* manage all state forest lands—including decisions to “log[], protect[], and care[] for”—to “ensure natural reforestation.” It is important to note, however, that this statute does not direct that state forest lands *must* be logged except as necessary to fulfill the purpose of reforestation. Additionally, if DNR permits logging, it *must* adopt rules “as it shall deem advisable,” ranging from the “methods of logging” to “protection” of forest lands, to perpetuate and protect Washington’s forest resources. Thus, DNR has considerable discretion to regulate such logging to promote healthy forests that fulfill aesthetic, ecological, and economic needs.

Nor does the general statute governing the BNR’s management of the public lands, RCW 43.30.215, affect this analysis. RCW 43.30.215(2) provides that the Board shall “[e]stablish policies to ensure that the acquisition, management, and disposition of all lands and resources within the department’s jurisdiction are based on sound principles designed to achieve the maximum effective development and use of such lands consistent with laws applicable thereto.” Because RCW 79.22.050 requires DNR to log the State Forest Lands “in the best interest of the State,” any DNR decision to conduct *less* than the maximum amount of logging possible in furtherance of the conservation goals in its HCP would be “consistent with laws applicable thereto.”

The revestment statute, RCW 79.22.300, also reflects that common law trust duties towards the counties and junior taxing districts do not prevent the Legislature, or its agency DNR, from restricting actions on the State Forest. The only way counties can take-back (“revest”) previously-transferred county lands is to make these forests a public park. If a county determines that state transfer trust lands are necessary for use as a public park, DNR “shall” re-

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<sup>33</sup> RCW 79.22.070.

convey the necessary land back to the requesting county. RCW 79.22.300. Timber resources on that land can then be harvested if consistent with the park's purposes and with the approval of county commissioners. RCW 79.22.310. Thus, counties may remove a substantial amount of forest lands from harvest to the detriment of the counties and junior taxing districts but the Legislature only permits these forests to become public parks.<sup>34</sup> If RCW 79.22.030 gives the state the authority to restrict what counties can do with revested land and if that authority can theoretically reduce the value of the revested land, the state has the authority to restrict logging to meet DNR-determined and set conservation guidelines.

#### **IV. Conclusion**

The OESF Landscape Plan must be corrected to clarify that programmatic and timber sale management decisions with respect to the State Forest lands are *not* limited by fiduciary concerns applicable to private trusts or to those standards applicable to the “state lands.” Instead, under RCW 79.22.050, DNR has real and substantial discretion to manage the State Forests in the best interest of the State for a variety of benefits, including ecological, aesthetic, recreational, and economic values. DNR must put the State's interest in conservation of all federally-listed species under its HCP ahead of the fiscal interests of the counties or junior taxing district beneficiaries.

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<sup>34</sup> For instance, DNR recently reconveyed approximately 8,400 acres of transfer trust lands to Whatcom County for use as a public park. This decision was criticized by the timber industry, which feared a piecemeal reduction in lands available for harvesting. See Ralph Shwartz, *Case against controversial Lake Whatcom park dismissed by state growth board*, TACOMA NEWS TRIBUNE, June 25, 2013, available at <http://www.thenewstribune.com/2013/07/25/2696156/case-against-controversial-lake.html>.

## Early History

Marcy J. Golde

The early history of the landscape planning in what is now called the Olympic Experimental State Forest started with the historic Timber/Fish/Wildlife Agreement, finalized in February, 1987<sup>35</sup>. The Final Report of that historic group was created cooperatively by Indian tribes and their organizations, State agencies, the environmental community and the forest industry with both industrial and small forest owners represented. It proposed a dual tract management system. One track was the standard regulatory system, but the other envisioned an innovative resource management plan using cooperative basin planning. Three pilot plans were started, including one in the Hoh-Clearwater Basin. This track ultimately failed, to be followed by several Habitat Conservation Plans between individual timber owners and managers and the federal government agencies under the Endangered Species Act. The current Landscape Plan and its RDEIS is part of this effort.

The Department of Natural Resources chose to precede the TFW Resource Management Plan with an internal effort called a Block Plan with a citizen advisory committee. The first meeting of this group was held on July 16, 1987 and included this statement on the role of the committee by the DNR Regional Manager, John Calhoun:

*“This planning process (the block plan) will be an initial component of a pilot Resource Management Plan under TFW. . .DNR will explore as many bridges as possible. . . this is an initial process.’ In response to fears that the Committee’s work may be disregarded Calhoun reassured members that the contributions of this group is seen as important by DNR and may well be the preliminary work and basis for a larger TFW plan. ”<sup>36</sup>*

The issues scoped in that first meeting will seem familiar to anyone reviewing the current OESF HCP Planning Unit Forest Plan Revised DEIS. The list has changed little in the last 16 years. The six issues then were:

1. *“Viability and Stability of community/industry/resources*
2. *Diversity of Resource management – forest, fish, water, soil, air, community quality of life, age and species*
3. *Ecology and Economics – how to maximize and manage both*
4. *Enhance management opportunities – Management options*
5. *Critical Habitats – Queets coho [salmon], spotted owl, old growth , unstable slopes, wetlands, elk winter ranges*
6. *Trust obligations and opportunities/perimeters/compensation”<sup>37</sup>*

The final report was completed in May, 1988. It included the following recommendations.

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<sup>35</sup> *Timber/Fish/Wildlife Agreement. A Better Future In Our Woods and Streams. Final Report*, February 17, 1987, pp. 12-13.

<sup>36</sup> Minutes of first meeting, Hoh-Clearwater Block Plan Advisory Committee, July 16, 1987

<sup>37</sup> Ibid.

- I. *“Treat the Hoh – Clearwater Block as its own sustained yield unit. Implement an even flow non-declining harvest level after a fifteen to twenty-five year conversion period... .*
- II. *Do not sell defaulted timber sales at an accelerated rate. Rather, utilize the available timber volume on the commercial forest land base to soften the transition to the non-declining even flow harvest level.*
- III. *Immediately implement a continuing consultation process with other natural resource agencies and affected tribes to determine the best silvicultural practices that provide fish and wildlife resource enhancement and protection. Tis consultation shall include, but not be limited to, salmonid overwintering habitats, variable rotation lengths, road closures, and silvicultural practices to mimic old growth characteristics.*
- IV. *Complete a comprehensive spotted owl survey in the block planning area by 1990. Conduct this survey to insure impartiality, include proportionally both old growth and second growth forest types. Develop and implement a cooperative management plan that, to the greatest extent possible, includes the adjacent land managers and owners.*
- V. *Conduct a comprehensive study of the future economic value of old growth and the potential of the block planning area to provide this unique product.*
- VI. *Conduct a comprehensive economic analysis of the communities affected by timber supply from the planning area. This study should be completed by an impartial third party, with the Department of Natural Resources sharing but not being the sole source for funding. Members of the advisory group should be included in the formatting of the study. The Department of Natural Resources will consider the study results in management decisions.*
- VII. *The community economic interest shall be represented in all planning efforts including the Olympic Resource Management Plan and the Commission on Old Growth Alternatives for Washington’s Forest Lands.*<sup>38</sup>

Perhaps if this thoughtful report had been fully and faithfully implemented, many years of fighting and many lawsuits could have been avoided.

The Old Growth Commission was formed the next month in June, 1988.

The first Olympic Experimental State Forest Draft Management Plan was sent out for 60 day review on July 16, 1990. We are all still trying to complete the management plan for the OESF.

#### REFERENCES

- Timber/Fish/Wildlife Agreement. A Better Future In Our Woods and Streams. Final Report, February 17, 1987.*
- Hoh-Clearwater Block Plan Minutes and Notes. Personal files of Marcy J. Golde.
- Report of the Hoh – Clearwater Block Plan Advisory Group to the Department of Natural Resources, May, 1988.*
- Commission on Old Growth Alternatives for Washington’s Forest Trust Lands, Final Report, June 1989*
- Olympic Experimental State Forest Draft Management Plan, July 16, 1990.*

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<sup>38</sup> Report of the Hoh Clearwater Block Plan Advisory Committee to the Department of Natural Resources, May 1988.

# **Biodiversity Considerations and Application to Research and Monitoring**

Jill Silver

The following comments discuss the Department's obligations to maintain or increase biological diversity on the OESF, and the value of testing and validating management assumptions through a rigorous adaptive management program.

## **I. Opportunities**

Five significant opportunities could present themselves if DNR follows this definition of biodiversity and exerts the effort to conduct studies and use Adaptive Management to provide certainty that prescriptions are resulting in desired outcomes:

- DNR will be truly managing the Olympic Experimental State Forest for the benefit of our children and grandchildren, and for multiple species thriving at all levels of diversity.
- DNR will produce a predictable flow of value-added timber as well as healthy, bio-diverse ecosystems, which support all four levels of diversity.
- DNR can show the world that conservation and commodity production are both possible at the same time, in the same forest; however, neither can be pursued to maximum levels without being mutually exclusive.
- DNR will gain certainty that responses to silvicultural treatments are resulting in desired outcomes.
- DNR will provide additional ecosystem services, which, if valued in an economic context, could also provide DNR with additional benefit, credit and income for beneficiaries.

## **II. Caveats:**

- The OESF is the experimental forest for DNR to learn how to integrate production and conservation, by combining conservation, production, research and monitoring, innovative silvicultural techniques. (HCP, I 14-15)
- Implementing an experimental combination of conservation and production utilizing adaptive management is not possible without data of sufficient statistical power to establish causative links between timber extraction and impacts on all species and habitats of interest, not just "age class" or other silvicultural benchmarks.
- The State Supreme Court has ruled that "a benchmark is needed to compare data as it is recorded. Data that cannot be analyzed, via comparison to a benchmark, is essentially meaningless because a harm cannot be detected unless there is a benchmark by which to define harm in the first place." (Swinomish v. Growth Board, 2007)

## **III. Biodiversity HCP Obligations in the OESF:**

The State HCP makes a number of references to biodiversity – e.g. species diversity, diversity of stand features, importance of downed wood, and the multiple species

intended to be supported within these forests. The goal of achieving forest-wide biodiversity is stated on page IV.118: “Management activities in these forests should be consistent with the stated objectives of the riparian conservation strategy and with other conservation efforts that require stands in older age classes to achieve forest-wide biodiversity and suitable habitat (e.g., for species like the northern spotted owl).” (Emphasis added.) Within each forest stand, the specific diversity of tree, shrub, moss, lichen, and fungal species, stand ages, legacy features, structural components, soil types, and site conditions support multiple species and their food webs. Taking the example of the imperiled Northern spotted owl, a web that includes soils, fungi, rodents, downed wood, and large live conifers is understood to be necessary to the species’.

As noted in the HCP (IV.118), managed forest stands in the OESF have been biologically and structurally simplified from decades of harvest, salvage, slash burning, and mass wasting. Maintaining or restoring biodiversity in industrial forestlands likely requires that managers incorporate the full suite of species represented in the different ecotones present in the OESF into stand inventories, and measure and monitor the presence and recovery of these species and structures in the forest units or stands.

#### IV. Defining Biodiversity

There is no single standard definition for biodiversity – which is a contraction of ‘biological diversity’ – but the term, first coined by E.O. Wilson in 1986, refers to the variety of life on the planet.

The Washington Biodiversity Council defines biodiversity as “*the full range of life in all its forms.*” It is sometimes referred to as the “web of life.” This definition includes “*...all species found within the state, from tiny soil microbes to towering Douglas-firs, as well as the interactions that sustain each species, such as predator-prey relationships, and the physical processes on which life depends, including chemical and nutrient cycling, water filtration, and climate regulation.*” (<http://www.biodiversity.wa.gov/ourbiodiversity/index.html>)

Biodiversity can be considered at four principal levels or scales. Ranging from smallest to largest, these are:

- Genetic diversity within and between species—that is, the unique genetic composition of individual members of a species;
- Species diversity, or the number and type of different species found in an area;
- Ecosystem diversity, or the different types of ecological systems of land, water, and organisms; and
- Landscape diversity, also referred to eco-regional diversity, where eco-regions encompass multiple ecosystems<sup>39</sup> to reflect broad ecological patterns.  
(<http://www.biodiversity.wa.gov/documents/WABiodiversityConservationStrategy.pdf>)

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<sup>39</sup> An ecosystem is defined as “an integrated ecological system of land, water, and living organisms in contiguous areas such as watersheds, landscapes, or regions.”

## V. Research and Monitoring Needs

- All harvest must be linked to research/monitoring.
- Broadening the Vision:

In order to evaluate the effectiveness of the modeled prescriptions, a working definition of biodiversity with benchmarks specific to the OESF must be established immediately. These must be refined through baseline inventory of representative sample sites for the biodiversity present in specific types or individual forest stands, watersheds, or sub-basins. To accomplish this, it will be necessary to determine the density, range or population and characteristics of different soils, fungi, plant and animal species in reference stands of intact old forests. From these inventories, desired future condition metrics can be developed to modify the working benchmarks as necessary to evaluate the community or individual species responses to silvicultural or restoration treatments.

The current stand inventories used by DNR (FRIS) use only silvicultural parameters specific to tree structure – e.g. dominant and sub-dominant trees, tree density, dbh, and limb size, and a few parameters related to specific species – Northern spotted owl (NSPOW) and marbled murrelet (MAMU). They are inadequate and incomplete, even as working benchmarks. These simple parameters do not support an evaluation of stand condition or recovery in terms of biodiversity or function.

One challenge to establishing benchmark metrics for biodiversity in specific stands is that there are no inventories for most species that exist on the OESF landscape. However, both the Olympic National Forest and the Olympic Park have multi-species inventories which can be used.

One source of economically and biologically useful research comes from recent work conducted in the PNW, reported in the article *Green Tree Retention in Harvest Units – Boon or Bust for Biodiversity?* (PNW Science Findings, Issue 96, 9/07). This study, part of the larger USFS DEMO research program, indicates that the benefits to biodiversity are higher in unharvested patches of 2.5 acres than in dispersed harvest (i.e. thinning) (although for some species (e.g. Northern flying squirrels), access to food sources was improved with dispersed harvest). Begun in 1992, and ongoing, this research was conducted as a large scale, multi-year, interdisciplinary project to examine the effects of various green tree retention strategies on multiple forest types. It was peer-reviewed, and the resulting design process was intensive, incorporating many changes. The high degree of rigor incorporated in this project provides an important model – the results inform management strategies in ways that modeled prescriptions based on limited inputs applied at a landscape scale would not. This on-going study is an excellent example for research and monitoring in the OESF. (<http://www.cfr.washington.edu/research.demo/>)

## VI. Salvage:

In Structural Habitat and Old Forest, as totally redefined in the Forest Land Plan and RDEIS, the following management protections are vital:

- If the stand condition after the blowdown event continues to meet all the threshold targets required to meet the habitat definition, no salvage shall be conducted.

- If a stand condition after the blowdown event fails to satisfy one or more threshold targets required to meet the habitat definition, but a variable retention harvest (VRH) will accelerate the stand on a trajectory toward pre-event habitat condition or better, and the biologist and state lands forester/IMF concurs that such action would be advisable, the following direction applies:
  - Implement only VRH that retains optimal structural cohorts from the existing stand and, as necessary, actions associated with nurturing of existing and regeneration of new cohorts.
  - Retain all remaining live standing trees.
  - Retain large (>20 inches diameter) snags in various states of decay if present.
  - Retain large down wood (>20 inches diameter) to sustain between 10 to 30 percent ground coverage, including the five largest logs per acre.
  - Retain at least 15 percent of the proposed activity area in an undisturbed state.
- In other stands: Retain large (>15 inches diameter) snags in various states of decay.

#### VII. Additional Recommendations and Questions:

- Roads and road impacts must be incorporated into the research platform.
- DNR must define how many thinning entries may be made under each rotation.
- DNR must record and report the actual rotation lengths as opposed to the modeled lengths.

## CITIZEN'S REVIEW OF THE OESF FOREST PLAN AND RDEIS

Don Hamerquist and Janeen Porter

This draft of the long delayed Forest Management Plan calls the purpose and function of the OESF into question. The State Lands' HCP laid out a specific experimental role for the OESF as a central element in DNR's commitment to an adaptive management process. The OESF was intended to provide DNR with a substantial forest land base that had the operational flexibility necessary to develop some experimental approaches to management. The goal was to find ways that could optimize timber revenue while still providing protection of public resources 'equal or greater' to what was provided by the State Lands' HCP. Where is the evidence that the OESF has been managed in that way? We don't see it here. After 15 years of the OESF, what is the report card on its achievements...what research has been done; what scientific experiments have been completed and which assumptions and hypotheses have been tested? Where are the results from this prolonged period during which DNR was supposed to be monitoring; "*...management activities to gather information about natural systems and how they are affected by management.*"? (page ES-3.)

This draft does not ask whether DNR has met these defined objectives and obligations for the OESF over the past decade and a half. It assumes that this is the case without providing any supporting argument or evidence. However, the facts are that DNR has not committed to, much less developed, a systematic, adaptive management regime in the OESF; it has not provided the funding to begin the monitoring of changes in baseline environmental conditions that are essential for experimental work in the OESF. And if any such experimental work has been conducted, the results are not systematized and publicly available and we have no idea what, if any management changes resulted. We have repeatedly asked for such material – as recently as the past month – and for one reason or another, it is never produced. We doubt that it exists.

Nothing in this document recognizes this failure or indicates that any serious changes in approach are contemplated. Instead the draft substitutes unsupported assertions and hypotheses for a clear analysis of obvious issues, obscuring the actual situation and the real trends in the landscape behind questionable modeling exercises that substitute for actual field research and empirical evidence - even where a good deal of such research and evidence is readily available.

We will present some of our general criticisms of this draft and then put these in the framework of three specific problem areas of DNR management in the Clallam Landscape Unit of the OESF. Before taking up more concrete issues, we'd like to emphasize a general methodological problem with the draft. DNR asserts that the State Lands' HCP is a matter of DNR policy, and that management actions that are (supposedly) "*based*" on this policy cannot be changed. Following this logic, the draft confines its discussion of OESF management within two alternatives, both of which are completely inadequate: it proposes either to continue the current policies and practices, or modify them by organizing harvests through a landscape unit modeling plan that would result in slightly improved revenue and, or so it is claimed, would only marginally reduce protections for public resources. These are not adequate alternatives for framing the needed discussion.

Strictly speaking, the State Lands' HCP is not a DNR policy. The State Lands' HCP is a binding legal agreement between the DNR and a range of state and federal agencies to forego normal enforcement of current environmental regulations in exchange for certain guarantees and undertakings about how timber harvest will be organized and implemented. According to the HCP, DNR not only can, but must adjust its

policies according to a process of scientific adaptive management that it is obligated to implement. The HCP provides limits and boundaries that constrain DNR policy in order to protect threatened and endangered species and to ensure adequate water and air quality. If any DNR management action significantly modifies this agreement, particularly if the changes adversely impact water quality or critical habitat for endangered or threatened species, the terms of the HCP are broken and DNR logging will be subject to existing requirements for specific take permits and TMDLs.

When the issue of whether past OESF management conforms to the State Lands' HCP is confronted and decided – and in our opinion DNR practice demonstrably does not conform to either the letter or the spirit of the State Lands' HCP – the proper 'no action' alternative should be to revert to the existing forest practice rules as adapted by the State Lands' HCP – not to DNR's current practices in the OESF. There are no limitations on possible management alternatives, except that other than they must assure protection of public resources and interests that is "equal or greater" than that provided the State Lands' HCP. There is no logic or necessity that supports the privileged status that DNR gives its own "Landscape Alternative" in this draft plan.

On page ES 4, in six bullet points, the draft document presents DNR's "Management Objectives" for the OESF. We don't agree with the steps the draft plan proposes to take to achieve these objectives. The rest of our argument is framed within these six management objectives, and, to expedite the discussion, we are reproducing the management objectives section of the DNR's document in full, retaining its original emphasis:

#### **"DNR's Management Objectives**

*DNR's management objectives for state trust lands in the OESF are based on the 1997 Habitat Conservation Plan and the 2006 Policy for Sustainable Forests. **The forest land plan, and the final selected alternative on which it is based, must enable DNR to meet these objectives.** All of these objectives must be achieved in the context of the integrated management approach.*

- *Provide a **sustainable flow of revenue** through the sale of timber. The current (2004–2014) sustainable harvest level for state trust lands in the OESF is 576 million board feet per decade, as approved by the Board of Natural Resources (Board) in 2007. By harvesting timber, DNR provides revenue to its trust beneficiaries to meet its fiduciary obligations (DNR 2006, p. 9 through 16).*
- *Per the requirements of the OESF **northern spotted owl conservation strategy** in the 1997 Habitat Conservation Plan, restore and maintain northern spotted owl habitat capable of supporting northern spotted owls in each of the 11 landscapes in the OESF by developing and implementing a forest land plan that does not appreciably reduce the chances for the survival and recovery of northern spotted owl sub-population on the Olympic Peninsula (DNR 1997, p. IV.86 through 106).*
- *Per the requirements of the OESF **riparian conservation strategy** in the 1997 Habitat Conservation Plan, "protect, maintain, and restore habitat capable of supporting viable populations of salmonid species as well as for other non-listed and candidate species that depend on in-stream and riparian environments" on state trust lands in the OESF (DNR 1997, p. IV.106 through 134)."*
- *Per the requirements of the OESF **multispecies conservation strategy** in the 1997 Habitat Conservation Plan, meet conservation objectives for unlisted species of fish, amphibians, birds, and mammals by implementing OESF conservation strategies for riparian areas, northern spotted owls, and marbled*

*murrelets and additional site specific conservation measures in response to certain circumstances (DNR 1997, p. IV.134 through 143).*

- *Fulfill existing 1997 Habitat Conservation Plan obligations for marbled murrelets through guidance provided in the “Memorandum for Marbled Murrelet Management Within the Olympic Experimental State Forest,” dated March 7, 2013 until the long-term Marbled Murrelet Conservation Strategy for state trust lands in DNR’s six Western Washington habitat conservation planning units has been completed and adopted (a copy of this memorandum can be found in Appendix F).*
- *Implement a **research and monitoring program** in the context of a structured, formal **adaptive management process** (DNR 1997, p. IV. 82 through 85).” (Page ES-4)*

We certainly agree that an adequate plan, “... **must enable DNR to meet these objectives.**”. However, based on both the textual evidence and on our experience, we know that DNR’s management strategy is preoccupied with the first: “...*Provide a **sustainable flow of revenue.***” No adequate approaches to the second, third, fourth, fifth, and sixth objectives have been implemented to date in the OESF, and none are suggested in this document, unless they are hidden somewhere in the appendices.

After considering the ambiguities involved in the first, “*sustainable...revenue*”, objective, we will move to specific examples and arguments to show that neither the past DNR OESF management nor the proposed modifications to it, adequately implement the other five objectives. Instead, the document proposes a number of steps that amount to regressions from the status quo in the OESF that already falls well short of some key requirements of the State Lands’ HCP – and that HCP is a far from perfect document.

The core of DNR’s policy argument is, as always, its “*fiduciary obligations*” to the citizens of the state. From the outset it should be clear that we don’t question whether DNR should aim to produce substantial income from timber harvest on state-owned and managed forest lands under its jurisdiction. However, we question presenting this as an obligation to achieve a “**sustainable flow of revenue**”. We are not clear if this language marks a change from traditional DNR policy that has aimed at a sustainable rate and volume of timber harvest. Clearly revenues from harvests will fluctuate depending on market prices, variations in methods and costs of production; the age and species of the harvested timber; etc. There is no good reason to put “*sustainable*” in terms of revenue flow as this formulation does – and particularly not when revenue is calculated narrowly as income from timber sales. This approach is likely to mask a failure to account for the total costs of production, and particularly of those costs that are externalized to the environment and eventually paid by the general public. Nor will this approach properly factor in other potential economic benefits, some of which may be indirect, that might accrue from less intensive or differently organized approaches to timber harvest

To answer the question of what rate of harvest might make the management of state forest lands, “*sustainable*”, we must be clear on what we intend to sustain. In our perspective – although apparently not DNR’s in this document - sustainability must relate to the overall ecology of the region. The sustainable rate of harvest is the rate that is consistent with maintaining and improving essential ecological processes. Our opinion is that sustaining a functioning old forest ecology on state-owned forest land will provide the greatest benefits to the actual owners of these lands - the people of the state. Some of these benefits may appear to be extra-economic in the short run, but all will eventually expand and generalize economic well-being.

If the DNR is convinced as we are, that protecting and expanding a functional and viable old forest environment is in the best interests of the public owners of those resources, and if has the political will to implement this conviction, setting the sustainable rate of harvest becomes a political and ecological issue, not a simple matter of economic bookkeeping. This conception would link the first management objective, sustainable harvest, to the adequate implementation of the second through the sixth management objectives. Only the even-handed implementation of all six management objectives is compatible with genuinely 'sustainable' outcomes.

These further management objectives provide the necessary context for approaching the issues involved in timber sale revenue and none of them have been treated seriously over the first fifteen years of the HCP in the OESF. The changes proposed in this document will be to further reduce and undermine the protections and limits on logging harvest that would be entailed by a more adequate approach to these management objectives.

*"Sustainable Revenue"*, a concept that must be quantified to be taken seriously, is not a separate and overriding goal. However, this plan places timber sale income as the top priority and treats the environmental considerations involved in the other five objectives as "constraints on harvest". It then proposes a range of ways to limit and attenuate these constraints

The specific criticisms that we will raise later in this comment are based on investigations of past, present, and proposed logging operations in the Clallam Landscape Unit of the OESF since the HCP was negotiated in 1997. We lack the resources and the opportunity to consider other areas of the OESF in similar detail, and undoubtedly miss a good deal even in this limited area. However, while recognizing that there will be variations across the OESF, some general conclusions can be drawn from this narrow sample since DNR operates under the same procedures and protocols in all of the OESF landscape units.

Our examples directly concern management objectives two, three, four, and five, but they all also raise management objective six. If DNR is fulfilling its obligations to, *"...Implement a **research and monitoring program** in the context of a structured, formal **adaptive management process**..."* (Page ES-4); the problems that we will be raising should have triggered the adaptive management response mandated in objective six. This last objective calls for *"...continually improving management practices by learning from the outcomes of operational and experimental approaches..."* Each of our examples raise questions about the record – or lack of record - of DNR attention to the problem; about the research and monitoring that was or wasn't done; etc. These raise the further questions of whether this record amounts to a formal adaptive management process – and if it doesn't, why is that? Adequate answers will have to meet DNR's own description of how this process should work – a description which we excerpted earlier and that we reproduce in full below:

*"As DNR implements integrated management, it will simultaneously learn how to achieve integration more effectively. In addition to operational experience, DNR will learn through **research and monitoring**. DNR performs research and monitors management activities to gather information about natural systems and how they are affected by management. This information will be applied to future management through the **adaptive management process**.<sup>4</sup> Adaptive management is a formal process for continually improving management practices by learning from the outcomes of operational and experimental approaches (Bunnel and Dunsworth 2009)." (Draft; ES-3)*

### THREE PROBLEMS

One major problem area is the OESF treatment of the State Lands' HCP/ requirements with respect to all listed species and, particularly, with respect to the habitat for spotted owls and marbled murrelets. These issues are addressed respectively in management objectives two and five. DNR proposes to meet both objectives through the protection and expansion of old forest habitat suitable for these species. To that end, by the end of the term of the HCP, DNR must have a minimum of 20% of the landscape in old forest habitat and another 20% of the landscape in so-called "structural habitat" that is on a short term trajectory towards reaching old forest conditions. However, rather than movement towards this objective, DNR management in the Clallam landscape has resulted in substantial reductions of existing owl and murrelet habitat and an accelerating harvest of those stands that are closest to becoming old forest habitat. This has been done directly through harvest and indirectly through the degrading impacts from segmenting larger stands and harvest related collateral wind damage.

The impact of process is easily demonstrated, notwithstanding the massive problems with current DNR stand and habitat mappings that have little relationship to facts on the ground. The "Blowder Creek" and "Blowder Ridge" harvests either have or will soon have cut portions of the 70 acre "*best habitat*" around a previously occupied spotted owl nesting sites. Other harvests, including "Mustard and Relish", "Big Country", "Big Foot", "Courtyard", "1600 Blowdown", "Blew Again" and "Rooster 30 Thinning" have cut or degraded significant areas of mapped owl habitat. We doubt that this is a complete list of such harvests.

The currently active "Blowder Creek" harvest includes a rebuilt road and a major bridge that bisects one of the three occupied murrelet sites in the landscape unit. "Courtyard", "Stumpy's Ride", "Clallam Combined", "Clallam Burn", "Big Country", "Big Foot" and a number of earlier FPAs impact and segment mapped murrelet habitat including some stands that are adjacent to the other two occupied murrelet sites in the landscape unit. Numerous FPAs, notably "Stumpy's Ride", Unit 1, have logged or propose to log in or adjacent to old forest murrelet habitat on the flyways up Charley Creek and the Little Hoko River to the three occupied sites. These obvious examples of effectively reducing owl and murrelet old forest and structural habitat are made more striking by the absence of any meaningful efforts to increase such habitat in other locations.

In addition, numerous DNR harvests; "Mustard and Relish", "Courtyard", "Big Country", "1600 Blowdown", "Blew Again"--have resulted in collateral wind damage to mapped habitat for both owls and murrelets that is not taken into account in post-harvest stand mappings. In some instances this has been limited to edge impacts. In other cases, such as with "Big Country", there are more substantial management related habitat blowdown problems that degraded or obliterated substantial blocs of previously mapped habitat. Then there have been major wind damages to habitat associated with earlier commercial and experimental thinnings, particularly the "Rooster 30 Thin", that contributed to major salvage operations; "1600 Blowdown", "Blew Again", and "Ridges Cleanup" that devastated a number of important older stands in the Charley Creek headwaters area - some of which were mapped habitat and others that should have been.

DNR's current management is arbitrarily and illogically maps younger and less complex stands as structural habitat while systematically harvesting stands are better fits with structural habitat characteristics and some that are close to old forest characteristics, e.g., "Stumpy's Ride, Unit 1". Perhaps as important as the impact of this logging on the overall amount of habitat acreage, is the fact that this habitat is increasingly fragmented into discrete blocs that are too small to function effectively. These features have been particularly evident in a range of FPA's in the southern portion of the landscape unit,

including; “Mustard & Relish”, “Big Country”, and “Big Timber”. However, they are also very relevant to pending harvests, “Stumpy’s Ride” and “Blowder Creek”, and will probably be a factor in some that are not yet sold, perhaps, “Blowder Chowder”.

The impact of these management actions is a substantial reduction of functional habitat for these vulnerable species for decades into the future. We have found nothing in the document to reverse this trend or that even addresses it as a problem. Since we have repeatedly brought the issue to the attention of DNR management, we regard this as a clear breach of the adaptive management obligations assumed in management objective six with respect to management objectives two and five.

We will limit our questions on management objective three, “*Riparian strategy*” to some issues of stream buffers and stream typing although closely related issues of wind damage modeling, slope stability, and mass wasting are frequently linked to riparian effects. Some of these will be dealt with in our comment on management objective four, “*multi-species...strategy*”.

There is an overriding issue with DNR’s buffering strategy for the OESF that we will only note here. The State Lands’ HCP provides most type 4 streams with buffers that are expected to average roughly 100 feet measured from the 100 year flood channel edge, and provides most type 3 (fish) streams with buffers that are expected to average 150 feet measured from the 100 year flood channel. Where necessary it protects these riparian buffers with an additional site specific wind buffer. OESF policy has made a number of adjustments to these requirements that it presents as experimental tests of alternative riparian strategies intended to achieve equal or superior results to the HCP buffers. Virtually all of these experimental adjustments in the OESF and the Clallam Landscape unit are biased towards reduced riparian protection and result in substantially less acreage receiving riparian protection in the OESF than under the normal riparian rules and procedures of the Stateland’s HCP. A collateral problem is that the OESF buffering strategy is so complicated and arbitrary that it is practically impossible to conduct effective compliance monitoring. These are issues that we have raised previously with DNR and it appears that, if anything, the proposed changes in buffering strategy that we see in the document will make the situation worse.

While recognizing this general problem with OESF riparian buffers, at this time our concern is with some more specific issues. Numerous segments of type 4 buffers associated with the “Courtyard”, “1600 Blow” and “P1400” harvests, as well as a number of earlier harvests, have been almost completely blown down and cannot be functioning properly. (We are sure this impacts some other Clallam harvests that are behind gates that are locked to us and can’t be reviewed until more recent aerial photographs are made available.) In addition, headwaters initiation wetlands in the “Blowder Ridge FPA” were logged through and the same fate is in store for some units of the “Clallam Combined” and the “Stumpy’s Ride” harvests. In short, miles of buffers and acres of headwater’s wetlands that are not functioning properly have accumulated over the past decade and a half. This should have triggered the sixth, ‘research and monitoring’ “*management objective*” and there should be some record of an adaptive management response. What is it? As far as we can determine, the choices in the draft plan are between the “No Action” alternative, that will continue to accumulate these channel segments with non-functioning riparians; or the ‘landscape modeling alternative; that will introduce further limitations on riparian buffering by, reducing minimum buffer widths, eliminating most riparian wind buffers, and weakening site tree buffer requirements for wetlands - among other ‘improvements’.

The second major riparian issue with current DNR OESF policy is that it systematically mistypes a significant number of types 3 or 4 channel segments which must be buffered – mapping them as type 5 water or as ‘not channels’ which receive less protection - in many cases none at all. Since OFCO has

exhaustively documented this practice in units of the current “Stumpy’s Ride” and “Clallam Combined” harvests, providing uncontroverted photographic evidence that this practice has resulted in sediment delivery to typed waters in clear violation of state clean water standards, we will not go into further detail here.

Management objective number four refers to; *“additional site specific conservation measures in response to certain circumstances”* This topic includes DNR’s obligations to eliminate or minimize problems related to slope stability, sediment delivery to typed waters from the road network and logging sites, and mass wasting potentials. We have numerous examples of problems here. For example, the bridge removal and road decommissioning project on the 1800 road failed in the middle of the last decade, delivering sediment to the upper Clallam River and raising dangers of a catastrophic failure that, according to DNR geologists, could activate massive deep-seated historic landslides. An inadequate “temporary fix” is still more or less in place to the best of our knowledge, but there has been no systematic review of the mistakes that resulted in the failure; there is no plan for a long term solution; further harvest and road building, including a large unit of the proposed “Clallam Burn” commercial thinning is planned for the area.

In the past few years there have been three large debris flow landslides that have breached major active sections of the road grid (the P1000 and P1700) and delivered substantial sediment to the Clallam and Little Hoko stream network. All of these were initiated from faulty construction on mid-slope roads. Each of these incidents, and we are sure there are more in the portions of the unit that we are locked out of (P2000/P1800 network), should have resulted in an investigation that assigned specific responsibility for the event and proposed specific remedies for the practices that were implicated. We are given many assurances that such incidents will not be repeated, but have little reason to take them seriously.

We have been listing a few of the situations where events and problems in the Clallam Landscape Unit should have activated DNR’s research and monitoring obligations and should have resulted in improvements in management practices as part of the adaptive management that is promised in objective six. We would welcome any evidence that there has been such a response and would be very interested in looking at its features and considering any changed practices that resulted. These are all matters that DNR can and should have dealt with - they should be able to discuss them directly and openly. There is no hint of this in the draft document.

We are not naïve. We know that there has been no systematic monitoring and no serious program of research in the OESF. Even the most rudimentary monitoring of trends in basic water quality parameters is still in the planning stages and is miserably underfunded and saddled with a study design that ensures failure or irrelevance. DNR has acknowledged that it will be decades before this monitoring might begin to produce results that could be linked to specific causes and result in specific management changes. There may have been some silvicultural experimentation but there is very little that focuses on environmental impacts of management actions. In the few cases where useful research has been done, for example, on temperature impacts on headwaters streams of basin harvest percentages, it appears to not be understood is certainly not seriously applied.

DNR conducts some minimal rules compliance monitoring on its own operation, but there is no serious program of effectiveness monitoring that facilitates a systematic evaluation of the effects of management actions in achieving overall ecological goals. Certainly there is no plan of research and monitoring that will consider the validity of the assumptions and hypotheses on which these policies are supposed to rest.

Our conclusion is that the experimental role projected for the OESF in the 1997 HCP has not been implemented, and this draft provides no plausible path to implement it in the future. There is no basis to continue to handle the OESF as a separate “experimental” area of DNR management of state forest lands. No special regulatory framework has been justified for the OESF – certainly not one that is even less protective than the State Lands’ HCP. The OESF should be placed under the same rules and procedures as are applied to other state managed forest lands and the record shows that DNR’s compliance with these rules and procedures in this area requires rigorous and independent monitoring.

## **APPENDICES (submitted as separate pdf files)**

- A. Conservation Groups Marbled Murrelet Scoping Comments – Washington Forest Law Center. 30 pages.
- B. Washington Department of Natural Resources – Habitat Conservation Plan – Riparian Management Procedures – Scientific Committee Recommendations. 11-23-1999. Jeff Cederholm, Chair. 46 pages.



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**Re: File No. 12-042001; comments on the scope of the draft environmental impact statement (phase two), including the proposed conceptual alternatives, for the long-term marbled murrelet conservation strategy.**

Dear Civil Servants:

Thank you for the opportunity to comment on the scope of the draft environmental impact statement (phase two), including the proposed conceptual alternatives, for the long-term marbled murrelet conservation strategy. These comments are submitted on behalf of the Sierra Club, Olympic Forest Coalition, Seattle Audubon Society, American Bird Conservancy, Audubon Society of Portland, Conservation Northwest, and Washington Environmental Council (hereinafter "Conservation Groups") in response to the request for public comments published by the Washington Department of Natural Resources on May 16, 2013.

This letter summarizes the applicable legal framework, provides comments on the conceptual alternatives proposed by the Washington Department of Natural Resources (DNR), and proposes an additional conceptual alternative (Conceptual Alternative #4) that the Conservation Groups request DNR include in the draft environmental impact statement for the proposed long-term conservation strategy. Because DNR and the U.S. Fish and Wildlife Service (the Service) are joint lead agencies for purposes of environmental review

under Washington's State Environmental Policy Act and the National Environmental Policy Act, we address these comments to both DNR and the U.S. Fish and Wildlife Service. Please include these comments in the administrative records for this matter. Please also inform the Washington Forest Law Center and each of the Conservation Groups in writing of any subsequent action you take related to the long-term marbled murrelet conservation strategy.

## I. Legal Framework

### A. Reasonable alternatives under NEPA and SEPA.

Under both the National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA), the stated purpose and need of a project limits the range of alternatives that are considered reasonable and therefore must be considered in an environmental impact statement (EIS). *See, e.g., Solid Waste Alternative Proponents v. Okanogan County*, 66 Wn. App. 439, 444 (Div. III 1992); *Cheney v. Mountlake Terrace*, 87 Wn.2d 338 (1976). For NEPA, the statement of purpose and need is the "underlying [directive] to which the agency is responding in proposing the alternatives including the proposed action." 40 C.F.R. § 1502.13. "The stated goal of a project necessarily dictates the range of reasonable alternatives." *City of Carmel-by-the-Sea v. U.S. Department of Transportation*, 123 F.3d 1142, 1155 (9th Cir. 1997); *see also Coalition for a Sustainable 520 v. U.S. Department of Transportation*, 881 F. Supp. 2d 1243, 1257 (W.D. Wash. 2012).

The alternatives analysis is "the heart of the environmental impact statement." 40 C.F.R. § 1502.14. The agency must consider all reasonable alternatives to the proposed action which fit the purpose and need of the project. *See Id.*; Wash. Admin. Code § 197-11-440(5). Selection of the alternatives and the adequacy of analysis are determined by the "rule of reason"—whether the information is necessary for decision-makers to make a "reasoned choice." *See California v. Block*, 690 F.2d 753, 767 (9th Cir. 1982) ("[T]he touchstone for our inquiry is whether an EIS's selection and discussion of alternatives fosters informed decision-making and informed public participation."). The range of alternatives must "explore and objectively evaluate *all* reasonable alternatives." 40 C.F.R. § 1502.14 (emphasis added). If alternatives do not comport with the purpose and need statement, the agency still must "briefly discuss the reasons for their having been eliminated." 40 C.F.R. § 1502.14. At the same time, "[t]he existence of reasonable but unexamined alternatives renders an EIS inadequate." *Ctr. for Biological Diversity v. U.S. Dep't of the Interior*, 623 F.3d 633, 642 (9th Cir. 2010); *Westlands Water Dist. v. U.S. Dep't of Interior*, 376 F.3d 853, 868 (9th Cir. 2004).

Washington's SEPA parallels NEPA. Under Washington law, an environmental impact statement must consider "[r]easonable alternatives" which "could feasibly attain or approximate a proposal's objectives, but at a lower environmental cost or decreased level of environmental degradation." Wash. Admin. Code § 197-11-440(5). "Reasonable[ness] . . . is intended to limit the number and range of alternatives, as well as

the amount of detailed analysis for each alternative” and only includes those alternatives within an agency’s jurisdiction to control impacts “either directly, or indirectly through requirement of mitigation measures.” *Id.* Washington agencies only need to consider alternatives that may meet the proposal’s objectives. *Barrie v. Kitsap County*, 93 Wn.2d 843, 855 (1980).

B. The Endangered Species Act.

Because the long-term strategy will be adopted as an amendment to the Washington Department of Natural Resources Trust Lands Habitat Conservation Plan (the HCP), the requirements of the Endangered Species Act drive the alternatives that should be considered in the draft EIS. Each of DNR’s proposed alternatives must therefore comply with Section 10(a)(2)(A) of the Act, 16 U.S.C. § 1539(a)(2)(A), which sets forth the requirements for a conservation plan that can be approved under the Service’s HCP program. Specifically, any proposed long-term strategy, and hence each conceptual alternative, must specify: (i) the impact that will likely result from the incidental taking; (ii) what steps DNR will take to minimize and mitigate such impacts, and the funding that will be available to implement such steps; (iii) what alternative actions to such taking the applicant considered and the reasons why such alternatives are not being utilized; and (iv) such other measures that the Service may require as being necessary or appropriate for purposes of the plan. *Id.*; *see also* 50 C.F.R. Parts 13, 17, & 222.

Each of DNR’s proposed alternatives must also be robust and specific enough to allow the Service to approve the amendment under sections 7 and 10 of the ESA. The Service must subject a proposed amendment to an incidental take permit to the same scrutiny as a new permit. *See* 50 C.F.R. § 13.23; 77 Fed. Reg. 23743, 23744 (Scoping notice) (April 20, 2012) (“The Service will ultimately determine whether the WDNR HCP, as amended by the long-term conservation strategy for the marbled murrelet, satisfies the ESA section 10 permit issuance criteria and other applicable laws and/or regulations.”). Specifically, before approving an amendment to an incidental take permit the Service must find that: (i) the taking will be incidental; (ii) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (iii) the applicant will ensure adequate funding for the plan; (iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; (v) measures the Secretary requires as being necessary or appropriate to the plan will be met; and (vi) the Secretary has received such other assurances as he may require that the plan will be implemented. 16 U.S.C. § 1539(a)(2)(B).

The requirement that an HCP “minimize and mitigate the impacts of the taking to the maximum extent practicable” is one of the most important. That requirement means that DNR and the Service must develop a long-term strategy that minimizes the impacts of the permitted take and that prescribes affirmative measures to offset those impacts, to the greatest extent that can be reasonably required of DNR. *See* Habitat Conservation Planning and Incidental Take Permit Processing Handbook: Issuance Criteria for Incidental Take Permits (hereinafter “HCP Handbook”) at 7-3 (1996). To make that

finding, the Service must have a reasoned explanation for why the mitigation is the most that DNR can perform. *See National Wildlife Federation v. Babbitt*, 128 F. Supp. 2d 1274, 1293 (E.D. Cal. 2000). While the “maximum extent practicable” determination takes into account feasibility, it is an objective consideration of the relationship of the level of mitigation to the level of take, not a subjective analysis of what the applicant can afford. *National Wildlife Federation v. Norton*, 306 F. Supp. 2d 920, 928 (E.D. Cal. 2004). Where an applicant has already demonstrated that a management strategy is feasible, it may not then adopt a less protective option because, by definition, that less protective option is not the maximum practicable. *Southwest Center for Biological Diversity v. Bartel*, 470 F. Supp. 2d 1118, 1157-58 (S.D. Cal. 2006).

Both the U.S. Fish and Wildlife Service and NOAA Fisheries will also have to reinitiate and complete formal consultation under ESA section 7 before the Service can approve any proposed long-term marbled murrelet conservation strategy. *See* 50 C.F.R. § 402.16. The U.S. Fish and Wildlife Service’s biological opinion will need to demonstrate that adoption of the long-term conservation strategy will not jeopardize any listed terrestrial species, including northern spotted owls (NSO), or adversely modify any designated critical habitat. Because any long-term strategy will also affect listed salmonids and other aquatic species, the U.S. Fish and Wildlife Service will need to consult with NOAA Fisheries to ensure that the Service’s approval of the long-term conservation strategy will not jeopardize any listed aquatic species or adversely modify aquatic species’ designated critical habitat. *See* HCP at III.64 (“Upland Influences on Salmon Habitat”); HCP at IV.56 (stating that the attainment of the HCP’s conservation objectives for salmonids requires reduction of impacts in upland areas). Additionally, both biological opinions will need to ensure that adoption of the long-term strategy will not “reduce appreciably the likelihood of both the survival *and recovery* of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.” 50 C.F.R. § 402.03; *see also Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service*, 378 F.3d 1059, 1070 (9th Cir. 2004).

C. The long-term conservation strategy criteria in the HCP.

The HCP itself should also guide DNR’s and the Service’s choice of alternatives. The HCP requires DNR to develop a long-term conservation strategy *for each planning unit* based on the information learned during implementation of the interim strategies in each planning unit. HCP at IV.40 (Step 5). The HCP specifically notes that:

After Steps 1-4 are completed for each planning unit, the information obtained during these and other research efforts shall be used to develop a long-term conservation strategy for marbled murrelet habitat on DNR-managed HCP lands *within that planning unit*. \* \* \* Negotiation of the draft long-term conservation strategy *for a planning unit* will commence with the U.S. Fish and Wildlife Service within 12 months of completion of the inventory surveys *for that planning unit*. \* \* \* *Once all individual planning*

*unit plans are complete*, a comprehensive review shall be conducted and modifications made if required. \* \* \*.

HCP at IV.40 (Step 5).

The HCP also provides some guidance regarding the content of the long-term conservation strategies. The HCP first sets forth important conservation concerns that each strategy should address in order to meet the intent of the HCP. These include:

- a. Developing a method for defining the perimeter of the breeding area for each occupied site;
- b. Providing sufficient habitat for breeding areas;
- c. Examining the entire landscape within a planning unit to determine which sites are most in need of protection and to consider landscape-level problems;
- d. Reducing fragmentation of remaining nesting habitat;
- e. Providing interior forest conditions;
- f. Providing buffers to minimize the effects of wind-throw and microclimate changes within the habitat, to help increase the amount of interior forest provided, and to reduce the amount of edge which has been associated with certain predator species;
- g. Minimizing disturbance at breeding sites during the nesting season;
- h. Preventing the isolation of breeding colonies and maintaining a well-distributed population; and
- i. Protecting all occupied sites in certain critical planning units that have small populations and little remaining habitat.

HCP at IV.43. The HCP then describes possible components of the long-term strategies before noting that the strategies must contribute to the survival and recovery of marbled murrelets in western Washington. HCP Chapter IV at pages 42-44.

Scientific research published since adoption of the HCP has confirmed the importance of the issues and strategy components described in the HCP. Since adoption of the HCP, marbled murrelet populations have continued to decline in the species' U.S. range, while the overall amount of suitable habitat has also continued to decline, especially on non-federal lands (Miller et al., 2012; Raphael et al., 2011; USFWS 2009). There remains a strong correlation between the amount of high quality nesting habitat and the

number of breeding murrelets (Raphael et al., 2011). And fragmentation of habitat is very likely leading to higher rates of murrelet nest predation and contributing to population declines (Malt and Lank, 2009; Miller et al., 2012). For these reasons, DNR's Science Team designed its 2008 long-term marbled murrelet conservation strategy to address population decline and adequate habitat quality, amount, and arrangement in order to make a significant contribution to recovery of the population. *See Recommendations and Supporting Analysis of Conservation Opportunities for the Marbled Murrelet Long-Term Conservation Strategy*, Washington Department of Natural Resources, 2008 (2008 Science Report).

Two points about the 2008 Science Report warrant discussion here. First, when DNR convened the Science Team (the authors of the 2008 Science Report), DNR did not simply seek recommendations from which it could pick and choose various pieces; rather, DNR charged that team with *creating* the long-term marbled murrelet conservation strategy that would be the preferred alternative for adoption into the HCP. Second, the Science Team considered DNR's trust obligations as it developed the 2008 Science Report: the team explicitly considered those obligations as they affected Pacific and Wahkiakum counties; and for other locations addressed by the 2008 Science Report the team evaluated the costs and benefits of their proposed conservation approach.

Because the 2008 Science Report represents the concerted effort of state and federal scientists to create a long-term marbled murrelet conservation strategy that would contribute to the recovery of marbled murrelets while avoiding unreasonable impacts to the trust beneficiaries, DNR and the Service should use the 2008 Science Report as the foundation for an additional, conservation alternative that will be considered in the draft EIS. The 2008 Science Report is not perfect, but DNR should not pick and choose pieces from it because doing so undermines efforts to create a credible long-term conservation strategy for western Washington. Moreover, DNR cannot reference its trust obligations to justify doing something less than the 2008 Science Report because that report already accounted for DNR's fiduciary duties.

Because the HCP specifically requires DNR to develop long-term conservation strategies for each planning unit, each strategy for each planning unit should address the issues identified on page IV.43 of the HCP and should include each of the components that DNR notes are needed for a credible conservation strategy. Such a strategy will make it much more likely that the long-term strategy for each planning unit will contribute to the recovery of marbled murrelets in western Washington, as required by the HCP. *See HCP at IV.44.* Further, because the HCP requires the long-term strategies to contribute to recovery of the marbled murrelet, DNR and the Service should ensure that each of the conceptual alternatives it chooses for the draft EIS will contribute to the recovery goals and actions set forth in the U.S. Fish and Wildlife Service's *Recovery Plan for the Marbled Murrelet* (1997). *See HCP at IV.44.*

D. Trust Obligations.

DNR's obligations to the trust beneficiaries are an important consideration, but they do not override the requirements of the federal Endangered Species Act or the HCP. One of the stated objectives for the long-term strategy is to satisfy DNR's trust mandate by generating revenue and other benefits for each trust. 77 Fed. Reg. at 23745. This reflects the commitment in the HCP to benefit the trusts by achieving long-term regulatory stability and security.

DNR's fiduciary duties do not require DNR to maximize revenue at all times; that view over-simplifies the complex set of duties that guide DNR's management of trust lands in western Washington. In *Skamania County v. State*, 102 Wn.2d 127, 133 (1984), the Washington Supreme Court addressed the sale price of timber and held that the State had a fiduciary obligation to enforce timber contracts for high sale prices. Overall land management presents a much different context in which DNR has to take into account long-term revenue, benefits for future generations, the "prudent person" standard, and the benefits of regulatory stability in carrying out its obligations under the ESA.

Attorney General Opinion 11 (AGO 11), written by then-Attorney General Christine Gregoire, provides a comprehensive analysis of the trust duty as it applies to the HCP. Ms. Gregoire clearly established that DNR had the authority to enter into an HCP.<sup>1</sup> Her opinion then made several crucial points:

- The trust duty is subject to federal and state laws of general applicability, including the federal Endangered Species Act.
- Even without an HCP, the ESA has "a direct impact on timber sales both within and outside the trust lands" due to the generally applicable ESA Section 9 "take" prohibition.
- DNR is authorized to satisfy the ESA by entering into a long-term habitat conservation plan under ESA Section 10.
- DNR may adopt a management plan that exceeds minimum regulatory standards if doing so results in short-term losses but promotes long-term productivity of the grant land trusts.
- Because DNR has a duty to both present and future generations, its trust management cannot benefit the current beneficiaries at the expense of future beneficiaries.

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<sup>1</sup> <http://www.atg.wa.gov/AGOOpinions/opinion.aspx?section=archive&id=9168>

- Where a trust beneficiary challenges DNR's implementation of its trust obligations, the highly deferential "abuse of discretion" standard of review applies.

As explained in AGO 11, DNR's trust obligations cannot and do not change the requirements of the ESA. DNR has the authority to enter into a highly protective HCP in order to ensure long-term productivity of its lands shielded from prosecution under the ESA for taking listed species. DNR has significant discretion in balancing short-term risks against long-term benefits to the trusts. Where DNR wishes to undertake additional uses not compatible with the financial obligations of trust management, it may do so provided there is compensation from such uses satisfying the financial obligations. RCW 79.10.120.

We note that under these standards, DNR has already proven that implementation of the interim marbled murrelet strategy complies with its fiduciary obligations. The interim strategy prohibited timber harvest in many thousands of acres of forests and also required significant expenditures in staff time and research costs. But as noted in the HCP itself, DNR expected that the HCP would "allow DNR to better fulfill its duties as trust manager" by:

- (1) providing certainty and stability in complying with the Endangered Species Act while producing substantial long-term income for trust beneficiaries,
- (2) allowing more predictable timber sales levels,
- (3) ensuring future productivity of trust lands,
- (4) keeping options open for future sources of income from trust lands,
- (5) increasing management flexibility, and
- (6) reducing the risk of loss to the trusts.

HCP at II.3. The interim strategy has provided all of these benefits. With the benefit of reduced implementation costs transferred to increased retention of mature forests, a strategy protecting more habitat than the interim strategy must be feasible.

In summary, NEPA, SEPA, ESA sections 7 and 10, the HCP, and DNR's trust obligations must all inform DNR's and the Service's choice of alternatives for the draft EIS. To ensure that the lead agencies have an appropriate range of options, as required by NEPA and SEPA, all of the alternatives must meet the requirements of ESA section 10(a)(2)(A) and also be robust and specific enough to allow the U.S. Fish and Wildlife Service and NOAA Fisheries to conclude that adoption of the long-term strategies will not jeopardize any listed aquatic or terrestrial species or adversely modify their designated critical habitat. DNR and the Service must also include an alternative that is very

protective of marbled murrelets and their habitat so the lead agencies have a legitimate conservation option that will contribute to the survival and recovery of the species. Having that option will also allow DNR and the Service to explain why, if they choose not to adopt the conservation option, their choice still minimizes and mitigates the impact of the taking to the maximum extent practicable.

## II. Comments on the proposed “Conceptual Alternatives.”

With those legal standards in mind, the Conservation Groups provide the following comments on DNR’s implementation of the interim strategy, suggestions for DNR and the Service to mitigate unauthorized impacts that occurred during implementation of the interim strategy, and comments on the proposed no-action and conceptual alternatives.

### A. The Conservation Groups’ concerns about DNR’s implementation of the interim strategy in the HCP.

Over the last few years some of the Conservation Groups and other concerned citizens have attempted to work with DNR and the Service to address numerous problems with DNR’s implementation of the interim strategy. The Conservation Groups remain committed to working with DNR and the Service to ensure that whatever long-term conservation strategy DNR adopts addresses the following concerns.

First, DNR is approximately ten years overdue in adopting the long-term murrelet conservation strategies required by the HCP and during that time marbled murrelet populations and habitat declined on non-federal lands in Washington. According to Step 5 of the interim strategy in the HCP, “The habitat relationship study, inventory study, and development of the long-term strategy *will occur consecutively within each planning unit – i.e., there will be no time gaps between Steps 2, 3, and 4.*” During that ten-year period—during the time when DNR should have been but was not implementing its long-term strategies—marbled murrelet populations declined precipitously in Washington State and very substantial amounts of marbled murrelet habitat on non-federal lands were lost to timber harvest. *Marbled Murrelet Effectiveness Monitoring, Northwest Forest Plan 2009 and 2010 Summary Report* (Falxa et al., 2011).

Second, DNR logging operations conducted during the time that DNR delayed adopting the long-term strategies have likely contributed to the murrelet’s decline. Although the marbled murrelet surveys required by the interim strategy were intended to find and protect occupied sites, DNR failed to complete the surveys in many areas and the 2008 Science Report determined that even where DNR conducted the surveys it failed to identify a substantial number of marbled murrelets on DNR-managed trust lands. Specifically, Appendix F to the 2008 Science Report estimates that DNR failed to identify up to 15% of the occupied murrelet sites on higher quality habitat in western Washington. Appendix F confirms other reports and information demonstrating that DNR often determined that forest stands were unoccupied by marbled murrelets when in fact they were occupied. *See, e.g., Terrestrial Surveys of Marbled Murrelets in the Pacific Coastal*

*Region of the Western Olympic Peninsula and Southwest Washington*, Anthony et al. 2003. Indeed, the Washington Department of Fish and Wildlife has repeatedly warned that DNR failed to correctly implement surveys and that DNR used an overly narrow definition of occupancy that is substantially less protective than the standard used on private lands. See *An Evaluation of Marbled Murrelet Habitat Prediction and Survey Implementation in the Washington Department of Natural Resources Straits Planning Unit*, Desimone et al. 2013, and the March 19, 2012 letter from the Washington Department of Fish and Wildlife to the Washington Department of Natural Resources concerning the proposed 2012 HCP amendment. Even if DNR had conducted the surveys in full compliance with applicable protocols, survey data indicating absence of murrelets is now stale and unreliable because all or nearly all of DNR's surveys were conducted long ago.

DNR's reliance on outdated and inaccurate survey data to plan logging operations means that DNR's delay in adopting the long-term strategies probably had very real and adverse impacts on marbled murrelets and their habitat. Specifically, DNR has very likely been harvesting (1) occupied habitat and (2) reclassified habitat near occupied murrelet sites.

Outside of southwest Washington, the HCP allows DNR to harvest surveyed, unoccupied, reclassified habitat if it is not within 0.5 mile of an occupied site and if, after harvest, at least 50% of the suitable murrelet habitat on DNR-managed lands in the watershed administrative unit would remain. The interim strategy prohibits DNR from harvesting *any* known occupied sites and from harvesting *any* reclassified habitat within 0.5 mile of an occupied site. Accordingly, the U.S. Fish and Wildlife Service's 1997 biological opinion on the HCP confined its analysis to impacts from the harvest of *lower quality habitats* that were expected to contain 5% or less of the occupied sites; to impacts from the harvest of *unoccupied*, reclassified habitat; and to impacts from the harvest of *non-habitat* adjacent to occupied murrelet sites. *Intra-FWS Concurrence Memorandum and Biological Opinion on the Proposed Issuance of an Incidental Take Permit for the Washington State Department of Natural Resources Habitat Conservation Plan* (January 27, 1997) (Biological Opinion) at 89-90.

Unfortunately, the 2008 Science Report and other information demonstrate that logging under the interim strategy has been and will continue to adversely affect marbled murrelets and higher-quality marbled murrelet habitat. By failing to identify actual occupied sites, DNR put at risk *both* the murrelets occupying unidentified, occupied sites *and all* reclassified habitat within 0.5 mile of the unidentified, occupied sites. If DNR harvested occupied, reclassified habitat, that harvest would have caused—and is likely to continue causing—three impacts: 1) the incidental take of marbled murrelets in reclassified habitat; 2) the loss of reclassified habitat within 0.5 mile of an occupied stand that was not identified as occupied; and 3) the fragmentation of occupied, reclassified habitat. Even if DNR has not actually harvested any occupied, reclassified habitat or reclassified habitat within 0.5 mile of an occupied site, those areas are currently at risk of being harvested.

Third, although the habitat relationship studies required by step 2 of the interim strategy were deemed essential to DNR's ability to implement the interim strategy and develop adequate long-term strategies, DNR and the Service amended the HCP in 2007 and 2009 to eliminate the requirement to conduct those studies in two of the six planning units, largely because the models DNR developed for the process did not work. Specifically, by letters dated February 23, 2007 and July 16, 2009, DNR and the Service amended the interim strategies for the North Puget and South Puget planning units to excuse DNR from conducting the habitat relationship studies in those units, to excuse DNR from conducting the marbled murrelet surveys in those two planning units, and to alter the protective measures that DNR applied to occupied and unoccupied suitable murrelet habitat in those units during the interim strategy.

Since those amendments, DNR has failed to develop an alternative scientific basis that could be used to develop long-term strategies for those units. By failing to gather that information—by failing to ascertain what kinds of habitat murrelets use in those units and where there are occupied stands in those units—DNR has risked harvesting occupied sites and risked harvesting more higher quality habitat than allowed in each watershed administrative unit in those planning areas. Moreover, because DNR failed to gather the required information, DNR now risks developing long-term strategies for those units that are not based on an accurate understanding of the marbled murrelets living there.

Fourth, the Service and DNR recently amended the HCP to allow DNR to harvest more than 12,000 acres of higher-quality, reclassified marbled murrelet habitat in southwest Washington (the 2012 amendment). The 2012 amendment allows DNR to harvest more than 12,000 acres of higher quality murrelet habitat—approximately 60% of the suitable marbled murrelet habitat in southwest Washington—that was completely off-limits to timber harvest before May 2012. The Conservation Groups strongly oppose the 2012 amendment because it fundamentally alters the HCP; because it is contrary to widely-accepted principles of conservation biology; and because it threatens to limit options for DNR's long-term conservation strategies. DNR must not harvest any timber in reclassified habitat in southwest Washington until it adopts the long-term strategies required by the HCP. At a minimum, if DNR chooses to harvest timber in reclassified habitat in southwest Washington, DNR must make sure that the draft EIS takes those impacts into account when it evaluates alternative long-term strategies.

The problems that DNR encountered during implementation of the interim strategy must be addressed in all conceptual alternatives and in any impacts analysis in the draft EIS. Specifically:

- All conceptual alternatives, and any long-term conservation strategy that DNR ultimately adopts, must include mitigation for DNR's lengthy delay in adopting the long-term strategies required by the HCP and mitigation for impacts to occupied sites and nearby reclassified habitat that occurred because of DNR's inaccurate murrelet surveys, including those in the Straits.

- All conceptual alternatives, and any long-term conservation strategy that DNR and the Service ultimately adopt, must include provisions that resolve the deficiencies in DNR's surveying efforts and data. As per the 2003 Pacific Seabird Group marbled murrelet survey protocol, DNR should protect all occupied sites into the future. Where DNR has not yet surveyed reclassified habitat as required by the HCP, DNR must survey that habitat before releasing it for timber harvesting operations. Additionally, all conceptual alternatives and any long-term conservation strategy must require DNR to *re-survey* (1) reclassified habitat that DNR determined was *unoccupied* using surveys that did not comply with the 2003 Pacific Seabird Group survey protocol; and (2) reclassified habitat in locations where DNR found no occupancy and the Washington Department of Fish and Wildlife found DNR's surveys to be inadequate. DNR cannot rely on old surveys that found lack of occupancy to avoid or minimize take of marbled murrelets because that survey data is unreliable. Moreover, it is well-established that many murrelets change nesting sites from year to year; consequently, stands that were unoccupied in one year might very well be occupied the next year or a few years later. DNR cannot assume that any given site is unoccupied simply because DNR conducted inaccurate or insufficient surveys 10-15 years ago.
- All conceptual alternatives, and any long-term conservation strategy that DNR and the Service ultimately adopt, must include a strong scientific basis for the long-term strategies proposed for the North Puget and South Puget planning units. The fact that the habitat models failed in those two units means that DNR cannot assume that the forest stand characteristics of marbled murrelet habitat are identical across all of DNR's planning units. DNR must develop a valid scientific basis for the long-term strategies for those two units—especially for the North Puget unit—and that basis must account for and explain the failed habitat models.
- As required by the interim marbled murrelet conservation strategy in the HCP, DNR must not harvest any timber in reclassified habitat in southwest Washington until DNR adopts the required long-term conservation strategies. If DNR chooses to log reclassified habitat in southwest Washington before DNR adopts the long-term strategies, DNR and the Service must both consider those impacts in the draft EIS and mitigate for those impacts in the final long-term strategies.
- Given the difficulties that DNR encountered in implementing the interim strategy, all conceptual alternatives, and any long-term conservation strategy that DNR and the Service ultimately adopt, must include a rigorous adaptive management program that requires DNR to monitor the implementation and effectiveness of its long-term strategy and implement management changes to protect and recover marbled murrelets over time.

B. Issues and potential mitigation that DNR and the Service should consider in the conceptual alternatives and draft EIS.

In DNR's scoping notice and request for public comments, DNR requested comments that address issues that DNR should consider in developing the alternatives, as well as suggestions for specific mitigation measures that the lead agencies should consider to address identified issues or impacts. This section provides the Conservation Groups' suggestions for mitigating unauthorized impacts to marbled murrelets and reclassified habitat that likely occurred during implementation of the interim strategy. These same measures could be adopted to ensure that the long-term strategies minimize and mitigate the impacts of authorized takings to the maximum extent practicable. And these mitigation measures also highlight biological issues that DNR and the Service should consider as it evaluates the impacts that are occurring or may occur as a result of DNR management of its trust lands. For example, the mitigation measures that could minimize impacts from campgrounds on DNR-managed lands suggest that DNR and the Service must consider the impacts of those campgrounds as they evaluate the conceptual alternatives.

The conceptual alternatives should consider the following measures to minimize take and/or to mitigate for past and future take of marbled murrelets:

- DNR should consider designating occupied sites and higher quality habitat where active management is unnecessary as a Natural Area Preserve (NAP) or Natural Resource Conservation Area (NRCA) to preserve their conservation value in perpetuity. DNR should prioritize the largest occupied stands with the highest density of murrelet detections for NAP or NRCA designation in all planning units.
- DNR should employ conditioned taste aversion (CTA) techniques to expose Steller's Jays and other predators to murrelet-colored and sized eggs treated with carbachol (carbarylcholine chloride) to induce subsequent aversion to murrelet-mimic eggs and potentially to actual murrelet eggs (Gabriel and Golightly 2011, Gabriel et al. 2013).
- DNR should install animal-proof food lockers and trash cans at all campgrounds and day-use areas near occupied sites and reclassified habitat to prevent attracting predators to murrelet habitat.
- DNR should improve waste patrol and cleanup in campgrounds and logging and planting sites, and introduce penalties for littering at logging sites and day-use areas, to prevent attracting predators to murrelet habitat.
- DNR should minimize disturbances, off-road vehicle trail building, and maintenance activities in occupied or highly suitable sites, including minimizing the use of loud motorized equipment, during the marbled murrelet breeding season (1 April – 15 September; Evans Mack et al., 2003).

- DNR should identify camping and picnic facilities near occupied or highly suitable sites and employ measures to prevent corvid attraction and predation.
  - DNR should provide interpretive outreach and education to minimize anthropogenic food availability to predators.
  - DNR should avoid reconstructing or building new roads and avoid encouraging heavy activity through occupied or highly suitable sites to minimize fragmentation and disturbance.
  - DNR should remove derelict fishing nets from marine waters within its jurisdiction and establish a robust program for obtaining funding for others to remove derelict fishing nets in areas not under DNR jurisdiction.
  - DNR should establish Marine Protection Areas to limit fishing net entanglement and allow prey populations to grow.
  - DNR should identify, implement, and promote improved oil spill prevention and regulation to better protect marbled murrelets at sea.
- C. The “No Action Alternative” must be continuation of the interim strategy not relinquishment of the incidental take permit.

The DNR scoping document lists the “No Action Alternative” as relinquishing the HCP conservation program and incidental take permit for marbled murrelets. According to the rationale provided at public hearings, DNR expects that if it does not adopt a long-term marbled murrelet conservation strategy the Service will rescind the incidental take permit coverage for murrelets, and therefore the likely outcome of not taking action is loss of the incidental take permit and reversion to the Forest Practices Rules.

DNR’s analysis is incorrect because it confuses the selection of alternatives with the consideration of impacts. Most simply put, “the no action [alternative] contemplates a continuation of the status quo.” *Ctr. for Biological Diversity v. U.S. Bureau of Land Mgmt.*, 746 F. Supp. 2d 1055, 1091 (N.D. Cal. 2009) *vacated in part*, 2011 WL 337364 (N.D. Cal. Jan. 29, 2011). For alteration to “management plans,” The Council on Environmental Quality advises:

In these cases “no action” is “no change” from current management direction or level of management intensity. To construct an alternative that is based on no management at all would be a useless academic exercise. Therefore, the “no action” alternative may be thought of in terms of continuing with the present course of action until that action is changed. Consequently, projected impacts of alternative management schemes would be compared in the EIS to those impacts projected for the existing plan.

*Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*, 46 Fed. Reg. 18026, 18027 (March 17, 1981).

Federal courts have likewise recognized that the status quo represents the management plan currently in existence. *See Am. Rivers v. FERC*, 201 F.3d 1186, 1200 (9th Cir. 1999) (approved continuation of current dam licensing regime as no action alternative and that license denial in case of relicensing would constitute action, not “no-action”); *Akiak Native Cmty. v. U.S. Postal Serv.*, 213 F.3d 1140, 1148 (9th Cir. 2000) (approved continuation of current mail delivery method as no action as it was “no change.”); *Pac. Coast Fed'n. of Fishermen's Ass'ns v. U.S. Dept. of the Interior*, 2013 U.S. Dist. LEXIS 32598 (E.D. Cal. 2013); *cf. Conservation NW. v. Rey*, 674 F. Supp. 2d 1232, 1246 n.12 (W.D. Wash. 2009) (“The no-action alternative must accurately reflect the state of the world at the time of the EIS.”).

Here, the status quo is continuation of the interim strategy. While the failure to adopt a long-term strategy may well provoke consequences, those consequences are properly considered in the draft EIS as impacts:

Where a choice of ‘no action’ by the agency would result in predictable actions by others, this consequence of the ‘no action’ alternative should be included in the analysis. For example, if denial of permission to build a railroad to a facility would lead to construction of a road and increased truck traffic, the EIS should analyze this consequence of the ‘no action’ alternative.

46 Fed. Reg at 18027.

Even if DNR ultimately does not choose the “no action” alternative, the selection of the correct “no action” alternative matters because its major function is to serve as the baseline against which the impacts of all the other alternatives are measured. *Friends of Southeast's Future v. Morrison*, 153 F.3d 1059, 1065-66 (9th Cir. 1998). Without this adequate baseline, the agency cannot take the requisite hard look at the environmental impacts of the project. *See Pit River Tribe v. U.S. Forest Serv.*, 469 F.3d 768, 786 (9th Cir. 2006). The correct analysis of impacts is simply the difference between the world as it is today and the world as it would be under various management schemes.

#### D. The “No Take” Regime and Conceptual Alternative 1.

As discussed above, if DNR and the Service choose to analyze an alternative that includes management without a long-term conservation strategy, it should do so as a Conceptual Alternative rather than a “No Action” alternative. Such an alternative appears to be very similar to Conceptual Alternative 1, which is described as “no take” along with some mitigation for take in undocumented locations and for disturbance. Accordingly, we

address the two together. In analyzing the “no take” regime and Conceptual Alternative 1, please consider the following analysis and impacts:

*1. Impacts to the Entire HCP and All Associated ITPs.*

The scoping document appears to assume that DNR could sever the marbled murrelet conservation program from the rest of the HCP and give up incidental take permit coverage for murrelets alone. However, the structure of the HCP and the analysis approving the HCP demonstrate that all of the species’ protections are intertwined and that removing the murrelet conservation program risks sacrificing the entire HCP.

Of most immediate consequence, the murrelet protections are inter-dependent with northern spotted owl and listed salmonid protections. For instance, the HCP relies on murrelet habitat to provide dispersal habitat for northern spotted owls on the west side of the Cascades. HCP at IV.25; Biological Opinion at 70. The HCP also relies on the murrelet conservation strategy to protect older forest habitat in the Straits and Southwest Washington planning units for use by northern spotted owls. HCP at IV.27, 29; Biological Opinion at 62-63. Similarly, the HCP discusses the link between protection of upland mature forests and water quality, *see* HCP at III.64 (“Upland Influences on Salmon Habitat”). It explicitly states that the attainment of the HCP’s conservation objectives for salmonids requires reduction of impacts in upland areas. HCP at IV.56.

It is impossible to know if the Services would have granted incidental take permit coverage for northern spotted owls and salmonids, or made “no jeopardy” findings for those species, without the benefits of the expected marbled murrelet conservation strategies. As a result, any consideration of abandoning incidental take permit coverage for the murrelet must take into account the likelihood that Service will be forced to reinitiate consultation on northern spotted owls and salmonids and that those agencies may then require greater protections across the landscape or find that issuance of the incidental take permits without the marbled murrelet protections will jeopardize listed species or adversely modify designated critical habitat.

The marbled murrelet conservation program is also critical to expected protections for unlisted species. Section 25.1(b) of the implementation agreement for the HCP provides that all unlisted species that use the late-successional habitat preferred by marbled murrelets and northern spotted owls will be covered upon listing. Table IV.13 in the HCP then lists the many species that benefit from the protections provided for marbled murrelets. This would likely no longer be the case if the protection of the interim strategy was removed. Analysis of relinquishing incidental take permit coverage for marbled murrelets must include an analysis of how will unlisted species will be impacted by expected timber harvesting operations and of whether and how those unlisted species will be incorporated into the HCP should any of them become listed in the future.

## 2. *Impacts to Critical Habitat Exclusions.*

The Service regularly excludes lands covered by HCPs from critical habitat designations in an effort to recognize existing protections and incentivize formation of new HCPs. Several species' critical habitat excluded DNR Trust Lands because of the HCP and its murrelet protections. For example, the proposed designation of critical habitat for the Mazama pocket gopher suggests excluding DNR Trust Lands because "[i]t was envisioned that the conservation strategies for salmonids, spotted owls, and marbled murrelets would serve to reduce the risk of extinction for the other wildlife species covered by the HCP." *Endangered and Threatened Wildlife and Plants; Listing Four Subspecies of Mazama Pocket Gopher and Designation of Critical Habitat*, 77 Fed. Reg. 73770, 73805 (December 11, 2012). In addition, the final critical habitat designation for the northern spotted owl excluded all DNR Trust Lands, in part because "[t]he marbled murrelet is addressed through a combination of steps culminating in the development of a long-term plan to retain and protect important old-forest habitat, which will also benefit the northern spotted owl." *Endangered and Threatened Wildlife and Plants; Designation of Revised Critical Habitat for the Northern Spotted Owl*, 77 Fed. Reg. 71876, 71973 (December 4, 2012). Any analysis of relinquishing the murrelet incidental take permit must take into account impacts of increased critical habitat regulation.

## 3. *Requirements for New Surveys.*

According to the Pacific Seabird Group survey protocol for marbled murrelets, survey results older than five years old are not reliable to show lack of occupancy in any given area (Evans Mack et al., 2003). Because DNR's surveys are almost all over a decade old, they are no longer indicative of murrelet absence in any individual suitable habitat block. Survey results indicating lack of occupancy may be useful to show broad trends in habitat preference, but cannot be relied upon in a "no take" regime or in any regime that allows timber harvesting in suitable marbled murrelet habitat. DNR's analysis of impacts of relinquishing the HCP must take into account the cost of: (1) surveying *all marginal and reclassified habitat* that has not yet been surveyed, so that DNR can avoid taking murrelets in those stands; and (2) resurveying reclassified habitat that was found to be unoccupied using survey protocols that did not comply with the Pacific Seabird Group's 2003 survey protocol. DNR must include these same analyses if it includes Conceptual Alternative 1 in the draft EIS.

## 4. *Mitigation for Past Harms.*

The "no take" regime and Conceptual Alternative 1 would both fall short of the expected benefits of the long-term conservation strategy as envisioned in the HCP in the "Needs, Purposes, and Objectives" (NPO). The HCP, in conjunction with the requirements of ESA Sections 7 and 10, dictate at a minimum "maintaining or increasing the reproductive success of the marbled murrelet." HCP at IV.43. Similarly, the "NPO" requires DNR to "make a significant contribution to maintaining and protecting marbled murrelet populations." 77 Fed. Reg. at 23745.

Both alternatives would fail to achieve maintenance or enhancement of murrelet populations because they would only protect currently known habitat and birds. Murrelets are declining at approximately 7% annually in Washington. Solely protecting the existing habitat, which provides less protection than the interim strategy, will not do enough to prevent or slow the steep decline of the population and therefore cannot achieve the requirements of the HCP or the NPO.

As a result, in order to be a viable, each alternative must include significant mitigation measures. For the “no take” regime, that will come in the form of post-termination mitigation, which is required by the implementation agreement if DNR relinquishes its permit for marbled murrelets. IA § 27.3. Post-termination mitigation is required because the interim strategy already allowed significant take across the landscape (indeed, that’s why DNR had to get an “incidental take permit”). For Conceptual Alternative 1, mitigation will have to be included in order to satisfy the HCP, the NPO, and the ESA. In analyzing the impacts of both alternatives, DNR should specifically describe the expected post-termination mitigation and discuss the impacts of such mitigation.

E. Conceptual Alternatives 2 and 3.

Conceptual Alternatives 2 and 3 both protect most or all occupied sites while providing mitigation in “Conservation Areas.” There is no detail about what percentage of occupied sites would be protected, how they would be chosen, or what the nature of management in the occupied areas or the “Conservation Areas” would be. As such it is difficult to comment on what the nature and extent of impacts will be.

Two broad points apply to both alternatives, however: any viable strategy must feature large, contiguous blocks of habitat in all of the planning units and must protect all occupied sites. As noted above, the HCP requires DNR to adopt a long-term conservation strategy that meets the requirements of the HCP in each planning unit. Additionally, protection of all occupied sites is necessary because, where the population has decreased by a third over the past decade while DNR delayed adopting long-term conservation strategies, every nesting murrelet is important. The murrelet population is racing toward extirpation and cannot afford any further sacrifice. Moreover, while the HCP poses the question of whether some occupied sites are more valuable than others, neither DNR nor the Service know the answer to that question because there are no studies linking habitat conditions to reproductive success. Given this lack of knowledge, the ESA requires DNR and the Service to proceed with caution.

Development of large, contiguous blocks of habitat in the planning units is not only required by the HCP, it is necessary to maintain a well-balanced population with gene flow and resilience to man-made and natural disturbances. According to the HCP, murrelets are particularly vulnerable to disaster events because of their reliance on marine and forested habitats. HCP at IV.42. An oil spill, such as the Tenyo Maru spill in 1991 off the Olympic

Coast, can easily wipe out an entire population area.<sup>2</sup> Similarly, a fire may eliminate entire habitat blocks. DNR and the Service also do not know how cycles in prey availability might impact murrelet presence in the various planning units. According to the HCP and the management strategy to date, “protecting multiple colonies within a reasonable distance of each other in each Watershed Analysis Unit and maintaining a well-dispersed population will help overcome and minimize” the localized risk of disturbance events. HCP at IV.42.

Finally, any alternative considered must be at least as protective as the interim strategy. In accordance with the HCP, the interim strategy protected all known occupied sites; protected 50% of all reclassified habitat in each Watershed Area Unit outside of southwest Washington; and protected all reclassified habitat in southwest Washington. If DNR could provide these protections for the last fifteen years in each planning unit, it can do at least that much for the next fifty-five. DNR has already proven that the interim strategy is feasible, and as a result, any strategy that offers less protection than the interim strategy cannot be found to minimize and mitigate to the maximum extent practicable.

### **III. The Conservation Groups’ proposed Alternative Number Four.**

Previous sections of this letter detail the legal rationale for including a robust conservation alternative in the draft EIS. This section presents a proposed alternative that Dr. Paula Swedeen and Dr. Kara Whittaker developed for the Conservation Groups. The Conservation Groups believe this alternative is consistent with DNR’s trust obligations and the NPO, and with this letter request that DNR and the Service evaluate this proposed alternative in the draft environmental impact statement and then adopt it as the long-term conservation strategy for the marbled murrelet.

#### **A. Issues that Alternative 4 addresses.**

This proposed Conceptual Alternative 4 addresses the following issues:

1. Population decline is severe – 3.7% per year range-wide in the U.S. and 7% per year in the northern part of Washington State from 2000 to 2010 (Miller et al., 2012). Though the past two years look better overall (at-sea population counts conducted for the Northwest Forest Plan, transmitted to the Olympic Forest Coalition on June 14, 2013), murrelet numbers in Zone 2 have plateaued. Zone 1 has increased in numbers back to near the highest levels observed since 2000, although it is hard to say what the recent reversal there means for long-term population trends, and most indications are that murrelets are still very vulnerable to extirpation from Washington so a precautionary approach remains important.

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<sup>2</sup> <http://www.darrp.noaa.gov/northwest/tenyo/>

2. The protection of all known, occupied sites. All known occupied sites must be protected from timber harvest and protected from predation with no-harvest buffers of at least 100 meters (328 feet). The 2008 Science Team recommended this buffer size to reduce edge-related predation, wind-throw, and negative microclimate effects. *See 2008 Science Report Appendix E: Performance Criteria For Buffers Around Occupied Sites.*
3. Large contiguous blocks of habitat support both higher numbers of murrelets and lower levels of nest predation: the larger the block, the more potential breeding murrelets are supported, and the greater the contribution to the population. Creating landscape blocks addresses several issues identified in the HCP (*see HCP at IV.43*), and serves as the mechanism by which to scale the necessary level of take mitigation created by DNR's management since 1997. There will be a minimum size and distribution of landscape blocks needed to produce a positive population impact and to sufficiently address past take.
4. The original HCP laid out important conservation issues that the long-term strategy needs to incorporate in order to meet the intent of the HCP. *See HCP at IV.43 and pages 4-5 of this comment letter.*
5. Problems with DNR's marbled murrelet surveys. *See Science Team Report Appendix F and pages 8-9 of this comment letter.* Additionally, WDFW recently reported major problems with DNR's murrelet surveys in the Straits Planning Unit (Desimone et al., 2013). These issues include lack of accurate habitat identification by applying DNR's habitat relationship model and inadequate station placement. This latter problem led to insufficient numbers of visits to habitat stands to accurately classify them as either occupied or unoccupied. Given this information, it is likely that some "unoccupied" reclassified habitat is truly occupied. Thus we recommend that DNR conduct new protocol surveys (Evans Mack et al., 2003) for any reclassified habitat outside of Conservation Areas (or Marbled Murrelet Management Areas, MMMA, per the 2008 Science Report) prior to it being released for harvest.
6. Problems with DNR's habitat models. In some places DNR's models led to mis-classification of habitat: some areas that should have been surveyed were not, and were subsequently made available for harvest. Therefore the "maximum of 5% of low quality occupied sites" take threshold may have been exceeded.
7. DNR has harvested mature forest in proposed MMMA's thereby reducing their intended effectiveness and increasing the amount of time it will take to make a significant contribution to recovery of the population.
8. Issues 3-7 support increasing the size of MMMA's where possible and ecologically logical.

9. The long-term strategies for the North and South Puget planning units need to be based on the 2008 Science Report for the other four planning units.

B. Description of Conceptual Alternative 4.

The purpose of this proposed Conceptual Alternative 4 is to maximize marbled murrelet conservation in planning units where conservation actions make the most contribution to the population in Washington State (South Coast, Columbia, Olympic Experimental State Forest, and North Puget) and maintain integrity of occupied sites in planning units where capacity of contribution is lower (Straits and South Puget Sound). A robust conservation strategy as outlined here can stay within legally required fiduciary responsibilities to the Trusts through financing and revenue-sharing mechanisms instead of through minimizing habitat contributions to murrelets.

There are three elements common to all Planning Units. These are:

1. Conceptual Alternative 4 retains and provides forest buffers for all known occupied marbled murrelet sites and old forest. Old Forest stands in all planning units should be protected by 100 meter no-cut buffers. At a minimum, “Old Forest” includes the polygons mapped as such on DNR’s most recent “Northern Spotted Owl Habitat Layer,” as well as the “High Quality Nesting Habitat” polygons in all planning units. *See* habitat definitions, HCP at IV.11. “Old Forest” also includes the polygons mapped as such by the 2008 Science Team in the OESF.
2. Conceptual Alternative 4 limits disturbance around occupied sites during the breeding season. Breeding season timing should be periodically reviewed based on the impacts of climate change. To start, Conceptual Alternative 4 uses the breeding season dates used in the most up to date Pacific Seabird Group survey protocol (1 April – 15 September). Conceptual Alternative 4 uses a 0.25 mile radius around occupied sites as the area in which DNR should limit disturbance.
3. Conceptual Alternative 4 uses an updated definition of platforms to reflect the current Pacific Seabird Group survey protocol (Evans Mack et al., 2003), as follows: “A platform is a relatively flat surface at least 10 cm (4 in) in diameter and 10 m (33 ft) high in the live crown of a coniferous tree”.

What follows is a description of Conceptual Alternative 4 by Planning Unit.

Southwest Washington (South Coast and Columbia Planning Units)

Start with MMMAs as delineated by the Science Team in the 2008 Science Report (Raphael et al., 2008). Look for opportunities to expand some MMMAs to 1) improve viability of known occupied sites; 2) to mitigate for past harvest in MMMAs that has reduced the ability of those MMMAs to reach maximum potential K’ (murrelet habitat

carrying capacity, *see* 2008 Science Report) since 2008; and 3) to mitigate for unauthorized take that has very likely occurred due to less than full implementation of the interim strategy since 1997.

Landscape Planning Units in which such expansion could take place include: Browning; the east central and southeast side of the Elochoman; Lebam; and Chehalis. Expansions should include the maximum amount of the most mature forest available, and in a configuration that minimizes edge. The amount of expansion should at a minimum be commensurate with the amount of take that occurred since 1997 and translated into acres of occupied habitat harvested under the interim strategy. The areas chosen for expansion should increase the number of “marbled murrelet units” as much as possible for the given number of acres (see Raphael et al., 2008, Chapter 4). Also utilize the Maxent habitat suitability model output generated by Raphael et al. (2011) to help re-delineate MMMAs.

Given that continued loss of habitat appears to be playing a role in recent declines of the population (Raphael et al., 2011; Miller et al., 2012), retaining existing habitat within and adjacent to MMMAs, even if it has been surveyed in the past and found to be unoccupied, and even if the interim strategy identified it as available for harvest, should be a priority. These are stands identified in yellow in the maps included in Science Team Report in Chapter 3.

It should be noted that areas in MMMAs that are not currently habitat will require management (habitat restoration thinning, not commercial thinning), and in many cases, such management may provide harvest volume in the early decades of the long-term strategy. Therefore, it should not be assumed that large MMMAs will result in a severe drop in revenue. DNR and the Service should develop, and DNR should adopt and implement, a thinning protocol based on the best available science to ensure that thinning actually contributes to restoration of marbled murrelet habitat and to ensure that DNR does not use standard commercial thinning in stands that have the potential to become suitable murrelet habitat. These aspects of the strategy should be analyzed as part of the draft EIS.

#### Olympic Experimental State Forest

The OESF strategy as described in the 2008 Science Report should be used as the basis for Alternative 4 for this planning unit. Some adjustments to boundaries may be needed to account for harvest since the completion of 2008 Science Report, especially to look for opportunities to incorporate existing habitat or stands that are close to habitat, or simply structured mature forest that can act as a buffer. The Maxent habitat suitability model output generated by Raphael et al. (2011) should be utilized to help re-delineate these MMMAs.

Further, no stand that is currently considered high quality habitat, but that has not been surveyed, or that was surveyed with older protocols and found to be un-occupied, should be released for harvest. Appendix F in the Science Team report describes that as

many as 55 stands that were determined to be unoccupied using pre-2003 Pacific Seabird Group surveys could have actually been occupied.

In addition, in landscape units where the strategy relies only on broader HCP policies to protect existing old forest, the need to provide larger buffers should be examined in light of low population productivity, which may be due to predation (Miller et al., 2012). In the absence of larger buffers, the EIS should analyze the extent to which other management policies will protect murrelet habitat stands from potential predation.

#### Straits Planning Unit

Incorporate existing 2008 Science Report recommendations unless it is determined that a more robust conservation strategy is needed to avoid local extirpation or to contribute to recovery in Zone 1. At this time, this planning unit should not receive additional acres for mitigation of take since 1997 given the relatively small contribution it can make to recovery compared to near-by federal lands. At the same time, all known occupied sites should be retained and adequately buffered, and suitable habitat that has been surveyed inconsistently with the Pacific Seabird Group protocol (Evans Mack et al., 2003) or was found to be unoccupied when surveyed more than five years ago should be re-surveyed prior to release or should be treated as occupied habitat and protected.

#### North Puget Planning Unit

This planning unit was not included in the 2008 Science Report recommendations due to incomplete survey data and poor performance of the habitat relationship model. We propose that DNR and the Service develop a strategy for Alternative 4 that uses the same underlying principles as used for southwest Washington and the Olympic Experimental State Forest.

In general this strategy should:

1. Create MMAs by blocking up existing older and mature forest habitat, including un-surveyed suitable habitat and surveyed un-occupied habitat.
2. Restore younger stands into high quality habitat within MMAs using active management in order to increase overall amount and effectiveness of habitat to contribute to a stable or increasing population.
3. Encompass as many known occupied sites as possible within larger MMAs and utilize the Maxent habitat suitability model output generated by Raphael et al. (2011) to help delineate MMAs.
4. Protect isolated occupied sites with adequate no-harvest buffers of at least 100 meters (328 feet).

5. Identify and protect all forest stands that meet the definition of Old Forest and are five acres or greater in size.
6. Take advantage of HCP commitments for spotted owls and aquatic species as much as possible. It appears that there is a good deal of overlap (though not total) between existing murrelet habitat and spotted owl Nesting, Roosting, and Foraging areas. Murrelet habitat can serve to anchor the spotted owl 50% habitat requirement by watershed administrative unit and thus meet two conservation needs simultaneously without unduly increasing the burden on the trusts.

Because many areas were not surveyed in this Planning Unit, care should be taken to either protect suitable habitat assuming it is occupied, or if such stands are not incorporated into MMAs and given long-term protection, protocol surveys should be conducted to determine occupancy prior to release for harvest.

If possible, DNR should re-convene the Science Team for a short period of time (for example, two full-day sessions separated by time for DNR staff to conduct supporting analysis) to more fully develop the strategy for this planning unit.

The justification for a strong strategy in the North Puget planning unit is that it represents a better opportunity for DNR to make a significant contribution to the population in Recovery Zone 1 than the Straits Planning Unit (the two PU's in Zone 1) due to having more acres of DNR land closer to marine waters and less federal land with habitat close to marine waters. Retaining as much existing habitat as possible and increasing the chances of murrelets to successfully breed in the habitat by limiting exposure of edges and minimizing landscape fragmentation may be needed to prevent extirpation from this portion of the range. Raphael et al. (2011) note that preventing habitat loss on non-federal lands is especially important in light of the fact that there is no more that can be done to conserve additional habitat on federal lands than is already occurring under the Northwest Forest Plan. This planning unit can be the recipient of some mitigation acres for take under the HCP since 1997.

#### South Puget Planning Unit

This planning unit can likely receive a relatively low emphasis given the low number of murrelets found on the water in this part of its Washington range. The few known occupied sites should be protected and adequately buffered, but no larger landscape approach should be required at this time. Suitable habitat should be protected as if it is occupied, or protocol surveys should be conducted to determine occupancy prior to release for harvest.

#### C. Consistency with the HCP.

This proposed Conceptual Alternative 4 addresses all of the factors listed in the HCP that need to be considered when implementing protective strategies for occupied sites

under the long-term strategy (*see* HCP at IV.43). Below we address each of these factors explicitly.

- Developing a method for defining the perimeter of the breeding area for each occupied site.
  - We recommend occupied sites be mapped as “Suitable habitat blocks” (HCP at IV.40-42) where at least one occupied site subcanopy behavior or condition occurs (Evans Mack et al., 2003) or follow the Forest Practices definition of “occupied marbled murrelet site” (WAC 222-16-010).
- Providing sufficient habitat for breeding areas.
  - Conceptual Alternative 4 is likely to be closer than the alternatives described in DNR’s scoping notice to providing sufficient habitat for breeding areas – i.e., to support successful breeding, by providing larger habitat blocks within the MMMAs. DNR and the Service should estimate the minimum statewide population size required for population stability and then calculate the total amount of habitat needed statewide to support it based on relationships reported in the literature. All alternatives in the draft EIS should be analyzed in relation to what they actually contribute toward a stable population, and how much of a gap there is between what is needed and what is projected to be provided.
- Examining the entire landscape within a planning unit to determine which sites are most in need of protection and to consider landscape-level problems.
  - Landscape planning occurs during the MMMA delineation process.
- Reducing fragmentation of remaining nesting habitat.
  - Habitat fragmentation is minimized through the deferral of all occupied sites, the maintenance of 100 meter (328 foot) buffers, and the restoration of high quality habitat in MMMAs.
- Providing interior forest conditions.
  - Buffer all occupied and Old Forest sites with 100 meter (328 foot) no-harvest buffers.
- Providing buffers to minimize the effects of wind-throw and micro-climate changes within the habitat, to help increase the amount of interior forest provided, and to reduce the amount of edge which has been associated with certain predator species.
  - Buffer all occupied and old forest sites with 100 meter (328 foot) no-harvest buffers and delineate and restore MMMAs.
- Minimizing disturbance at breeding sites during the nesting season.

- Prohibit forest practices, including road construction and maintenance, within 0.25 mile of an occupied marbled murrelet site within the breeding season (1 April – 15 September; Evans Mack et al., 2003).
- Preventing the isolation of breeding colonies and maintaining a well-distributed population.
  - Protect all occupied sites in all Planning Units. Delineate and restore MMMA in the OESF, North Puget, South Coast, and Columbia Planning Units.
- Protecting all occupied sites in certain critical planning units that have small populations and little remaining habitat.
  - Protect all occupied sites in all Planning Units.

Another component of this strategy could be targeting private land acquisitions adjacent to edges of smaller MMMA's in order to increase their effective area over the long-term and adjacent to isolated occupied sites in order to improve the chances that breeding birds will be able to successfully rear young. These additions could be put into the Community Forest Trust, or a modified version thereof, or designated as NAP or NRCA in order to decrease harvest pressure. There may be an opportunity to use financing from carbon markets or funds from a carbon or fee and dividend program to acquire and manage these lands. While this aspect of a strategy may be hard to analyze in an EIS, we offer it as a mechanism to consider as the agency crafts its preferred alternative.

#### **IV. Conclusion.**

Thank you for the opportunity to comment on the scoping of the NEPA and SEPA processes for the development of the long-term marbled murrelet conservation strategy. We look forward to working with DNR and the Service on this matter so that DNR meets its obligation to contribute to the recovery of marbled murrelets in the State of Washington.

Thank you also for carefully considering our proposed Conceptual Alternative 4. Both NEPA and SEPA require DNR and the Service to consider a strong conservation strategy as a proposed alternative in the draft EIS. Similarly, the ESA requires DNR to adopt a strong conservation strategy that minimizes and mitigates the impacts of the taking to the maximum extent practicable; that avoids jeopardy to all listed aquatic and terrestrial species inhabiting forestlands in western Washington; and that avoids adverse modification of designated critical habitat. The HCP also requires that any long-term strategy contribute to the recovery of marbled murrelets and, as noted in Attorney General Opinion 11, compliance with the HCP is consistent with DNR's obligations to the trust beneficiaries.

Accordingly, the Conservation Groups respectfully request that DNR and the Service include Conceptual Alternative 4 in the draft EIS and then adopt it as the long-term marbled murrelet conservation strategy. If DNR and the Service choose not to include Conceptual Alternative 4 as an alternative in the draft EIS, we request a clear explanation

for that choice. Additionally, if DNR and the Service determine that the Conservation Groups' proposed Conceptual Alternative does not satisfy DNR's fiduciary obligations we request that the lead agencies specifically explain: 1) what fiduciary obligations are at issue; and 2) why Conceptual Alternative 4 does not meet those requirements.

Please respond to each of the comments submitted in this letter and please include the Conservation Groups proposed Conceptual Alternative 4 as an alternative in the draft and final environmental impact statements. Finally, please contact me at the letterhead address or by phone at (206) 223-4088 if you have any questions about this letter or if you would like to meet with the Conservation Groups to discuss any issue discussed in this letter.

We look forward to working with DNR and the Service on this important project and we very much appreciate your attention to these comments.

Sincerely,

WASHINGTON FOREST LAW CENTER

A handwritten signature in black ink, appearing to read "Paul Kampmeier". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

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Nov. 23, 1999

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**WASHINGTON DEPARTMENT OF NATURAL RESOURCES - HABITAT  
CONSERVATION PLAN - RIPARIAN MANAGEMENT PROCEDURES -  
*SCIENTIFIC COMMITTEE RECOMMENDATIONS***

**Scientific Committee:**

**Jeff Cederholm, salmon biologist (Chairman), Jeff DeBell, silviculturist, Dr. Bruce Glass,  
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We thank the DNR Regional and Division staff that either verbally conveyed or sent in review comments on an earlier draft of this report. We greatly appreciate the thoughtful peer review given by Dr. Dean Berg, Private Consultant; Dr. Connie Harrington of the United States Forest Service; Dr. Tim Quinn, of the Washington Department of Fish and Wildlife; Dr. Tom Sibley of the University of Washington; and George Wilhere, Dan Walters, and Ken Schlichte of the DNR.

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**INTRODUCTION**

## General

Under the riparian conservation strategy of the Washington Department of Natural Resources Habitat Conservation Plan (DNR HCP), DNR is required to develop methods for making site-specific management decisions in riparian management zones (RMZs), and describe these methods in DNR's implementation procedures (see DNR HCP page IV.61). To begin this task DNR assembled the HCP RMZ Scientific Committee consisting of state, federal, tribal, academic and environmental representatives (see above author list). This committee was asked to develop riparian management procedures for the Five Westside Planning Units (North Puget, South Puget, Columbia, South Coast, and Straits), an area of approximately 1.2 million acres of state forest land (Figure 1). The Olympic Experimental State Forest (OESF) and the Three Eastside Planning Units were not included in this analysis. The riparian conservation strategy proposed for the OESF is distinct from that for other HCP planning units, mainly because of the emphasis on research within the OESF.

## Riparian Conservation Objectives

Within the DNR HCP, DNR identified two conservation objectives for the riparian conservation strategy for the five-west-side planning units:

- (1) to maintain or restore salmonid freshwater habitat on DNR-managed lands, and
- (2) to contribute to the conservation of other aquatic and riparian obligate species.

As described in Section C of Chapter III of the DNR HCP entitled: *Salmonids and the Riparian Ecosystem*, salmonid habitat includes the entire riparian ecosystem, and therefore, conservation objective (1) requires maintaining or restoring the riparian ecosystem processes that determine salmonid habitat quality. Also, as described in Section C of Chapter III, hydrological and geomorphological processes originating in upland areas may also affect salmonid habitat. Thus, conservation objective (1) further requires that the adverse effects of upland management activities be minimized. Contributions to the conservation of other aquatic and riparian obligate species, conservation objective (2), will occur indirectly through forest management that maintains or restores salmonid freshwater habitat.

To meet these conservation objectives, DNR will manage RMZs until they are on a trajectory toward older forest conditions. If an RMZ is already in an older forest condition, or is well on its way to becoming so, then there is no need to further manage the RMZ. Once the decision is made to enter an RMZ to carry out riparian silvicultural procedures, then the recommendations of this report are not to be considered discretionary, they must be followed, if appropriate for the site, to meet our HCP obligations. Additional management within the RMZs, however, that goes beyond riparian silvicultural management applications, such as inchannel large woody debris (LWD) placement and dead and down woody debris (DWD) placement on the forest floor, are discretionary.

## **Salmonids**

The taxonomic group of fishes called salmonids include the Pacific salmon, trout, and char. The salmon and trout include the chinook, coho, chum, sockeye, and pink salmon, and the rainbow (steelhead) and cutthroat trouts. The char include the dolly varden and bull trout. Several salmonid stocks in the area covered by the HCP are candidates for Federal listing, or are already listed.

All salmonids have unique geographical distributions, life cycles, and habitat requirements; but from the perspective of forestry impacts, the similarities among all the above mentioned species far outweigh the differences. Therefore, in the following discussion, distinctions among the life cycles of these species is not emphasized.

## **Other Aquatic and Riparian Obligate Species**

Riparian obligate species are those that are: "riparian-dependent species that have at least one of their life requisites met exclusively in riparian or aquatic habitat." (Report to the TFW Policy Committee April 1998). Riparian habitat provides such species with important functions of their life cycle, such as reproduction, feeding, resting and movement. Riparian obligate species in Washington include a number of amphibians, reptiles, birds, mollusks, and mammals. Many nonsalmonid fishes and aquatic insects living in streams and wetlands could also be considered riparian obligate species. For further information on these and other species, refer to the April 1998 report to Timber/Fish/Wildlife Policy Committee: Habitat Associations of the Riparian-dependent Amphibians, Reptiles, Birds, Mammals and Mollusks in Commercial Forest Land of Washington State. This report lists over 100 riparian obligate species, including 10 species of amphibians, of which eight are "species of concern."

## **Riparian Ecosystems**

The riparian ecosystem (RE) is an area of vegetation along waterbodies that includes the aquatic area, the riparian area, and an area of upland direct influence (Figure 2). The aquatic area includes the active water-body and its 100 year flood plain. The riparian area is an area of complex habitat that lies between the aquatic area and the uplands. The upland area of direct influence is located upslope of the riparian area and is typically characterized by well drained soils and a conifer forest community. Properly functioning REs depend on a continuum of physical and biological processes that extend throughout a watershed. To protect REs from upslope forestry practices, one must restore overall watershed processes, as well as providing scientifically sound RMZs. An additional wind buffer may also be needed as part of the RMZ, when there is a moderate to high potential of windthrow damage.

Conditions in, and sizes of the RE change from site to site, and over time at one site, along a waterbody. Principal expressions of such changes are: 1) shifts in food and energy production from out-of-stream to instream areas; 2) changes in physical characteristics of stream (e.g., depth,

width, gradient); and 3) succession in RE plant communities over time.

### **Rationale Behind Riparian Management Zone Widths**

The width of RMZs left during forestry activities under the DNR HCP should be wide enough to restore and maintain RE functions. Generally, the width of RMZs needed to maintain RE function has been found to fall within a distance of 1 site potential tree height (SPTH) from the water body (Figure 3) (Forest Ecosystem Management Assessment Team (FEMAT) 1993). The FEMAT definition of a SPTH is “the average maximum height of the tallest dominant trees (200 years or more) for a given site class.” (See FEMAT report, page V-34). For the purpose of the DNR HCP, however, the SPTH will be determined by the average of the dominant trees at breast height age 100 years; based on published site index curves by James Flewelling for western hemlock, and James King for Douglas Fir.

Under the DNR HCP the width of RMZs along Type 1, 2, and 3 Waters (Water Types are defined in WAC 222-16-030) is based on the site potential conifer tree height in a mature 100 year old conifer stand. We define a mature stand as one in which the annual net rate of growth has culminated (Thomas et al. 1993). In general, conifer stands in the Pacific Northwest reach maturity between ages 80 and 100 years (FEMAT 1993; Spies and Franklin 1991); however, it may be 200 years before they reach the old-growth stage (Spies et al. 1988; Spies and Franklin 1991). The SPTH in a 100 year old forest stand was selected as the basis for the HCP RMZ widths, because site index curves for older forests were not reliable. Also, it is known that Douglas fir and western hemlock, the principle overstory tree species on DNR lands, obtain 70 to 80 percent of their old-growth height in the first 100 years of growth. Field measurements (McDade et al. 1990) indicate that buffer widths equal to approximately 60 percent of the average tree height will provide 90 percent of the natural level of instream large woody debris. Extrapolating from these results, a buffer width based on the 100-year SPTH should provide more than 90 percent of the natural level of instream large woody debris. Type-4 Waters were given strictly a 100 foot RMZ on either side of the creek, based on their small size and the lack of research information on these kinds of streams.

A recent analysis of the FEMAT riparian process effectiveness curves (Figure 3, this report) by the Oregon Forest Industries Council (CH2MHill 1999), indicates significant limitations for use of these curves in prescribing forest management practices along streams. The limitations arise because some or all the FEMAT curves:

- ignore ecological and site variability
- are subjectively derived and lack a rigorous data base
- were extrapolated from non-riparian areas
- have not been validated through empirical studies.

The Oregon Forest Industry Council report (CH2MHILL 1999) makes the following points about the FEMAT curves: The FEMAT litterfall relationship over-emphasizes the contribution of litter

from trees more than 0.2 SPTH from the channel. No published scientific literature was found to support the FEMAT root strength curve. Studies show that approximately 80% of shade effectiveness occurs within 0.5 SPTH, and 90% effectiveness within 0.7 SPTH. Actual field data indicate that the effectiveness of coarse wood (LWD) recruitment decreases much more sharply with distance from the stream than indicated by the FEMAT curves. The field studies indicate that wood recruitment effectiveness is 80-90% within 0.4 SPTH, whereas the FEMAT curve indicates only about 60% effectiveness at 0.4 SPTH. Also relevant to this HCP, five scientific studies suggest that sediment filtration typically is about 80% effective within 80 feet of the stream, and approaches 100% within 150 feet of the stream. Effectiveness depended on whether the sediment source is concentrated (road drainage, landslide scars) or diffuse (road fills, harvest activity). We recognize that the FEMAT curves are in need of further study, and therefore, in this report we recommend that research be carried out to better define these relationships.

### **Riparian Ecosystem Benefits Provided by RMZs**

The main group of riparian ecosystem benefits provided by RMZs are: 1) stream bank stability, 2) nutrient load, 3) stream shading, 4) large woody debris recruitment, 5) sediment filtering, and 6) downed woody debris on the riparian forest floor and snags.

*Stream bank stability* - Riparian vegetation stabilizes stream banks. Therefore, removing stream bank vegetation leads to increased streambank erosion and mass wasting, resulting in sediment loading (amount of suspended and deposited sediments). The strength and density of the root network play a critical role in stream bank stability. Root strength declines appreciably at distances greater than one-half a tree crown diameter (FEMAT 1993). Therefore, the most important trees for bank stability lie within one-half a tree crown diameter from the stream bank. Likewise, the size and density of trees growing along a stream should be key variables determining bank stability, but no studies have investigated the relationship between relative density and stream bank stability.

*Nutrient load* - The amount of in-channel small organic material, or detritus, affects stream productivity (Bjornn and Reiser 1991). Higher stream productivity leads to higher densities of herbivorous aquatic invertebrates. In forested small- and medium-order streams, riparian vegetation is the primary source of detritus (Gregory et al. 1987; Richardson 1992). Removal of vegetation along headwaters will lessen this input and may significantly affect stream productivity throughout a watershed. For a watershed in eastern Quebec, estimates showed that approximately 23 percent of the annual particulate organic load collected at the bottom of the watershed was contributed by first-order streams (comparable to Types 4 and 5 streams as defined in WAC 222-16-030) (Connors and Naiman 1984). This finding suggests that upper headwater areas without fish contribute detrital input to downstream segments that support fish. However, the importance of this upstream contribution to overall detrital input is not known.

Stand age and canopy cover significantly influence detrital input to a stream system. Old-growth forests contribute approximately five times as much detritus to streams as clearcut forests (Bilby

and Bisson 1992). Richardson (1992) found that old-growth forests contributed approximately twice as much detritus as either 30- or 60-year-old forests. However, even though streamside timber harvest reduces detrital input, the resulting reduction in forest canopy in the riparian zone leads to increased light levels and algae production in the aquatic zone, which in turn produces detritus in the stream (Bilby and Bisson 1992).

Richardson (1992) estimated that 70 to 94 percent of all leaves that enter a stream segment are transported downstream. Some detritus added to streams originates from beyond the immediate streamside area. The maximum source distance of in-channel detritus is not known, but it has been estimated that 14 to 25 percent of the total litter input is blown in (Richardson 1992).

Erman et al. (1977) found that the composition of invertebrate communities in streams with riparian buffers wider than 100 feet was indistinguishable from those of unlogged streams. From this result, FEMAT (1993) inferred that riparian buffers at least 100 feet wide delivered sufficient small organic material to maintain a diverse aquatic community.

*Stream shading and microclimate* - Stream shading is principally a function of vegetative cover. Over-stream riparian vegetation moderates energy flow into and out of aquatic ecosystems (Chamberlin et al. 1991). Removing riparian vegetation and the shade it provides increases summer water temperatures. Lower winter water temperatures may also occur because removing riparian vegetation (Chamberlin et al. 1991) allows heat to escape. The degree to which water temperature is affected by riparian vegetation is a function of stream size (Chamberlin et al. 1991). For example, the temperature of shallow water bodies responds more quickly to changes in air temperature, and the temperature of small streams is more sensitive to changes in riparian vegetation because the forest canopy covers a higher proportion of the stream's surface (Chamberlin et al. 1991). Steinblums et al. (1984) found that local topography (slope) and forest stand density (basal area) were the most statistically significant variables determining the amount of stream shading. Microclimate is important to consider when deciding management goals because of its effects on ecosystem processes and functions. According to Brosofske et al. (1997) temperature, solar radiation, and humidity affect plant growth by influencing physiological processes such as photosynthesis, respiration, seed germination, mortality, and enzyme activity (Kramer and Kozlowski 1979; Levitt 1980; Tromp 1980; Harmon et al. 1986; Hungerford and Babbitt 1987; and Fowells and Means 1990). Beschta et al. (1987) claim that buffer widths of 100 feet or more will provide the same level of shading as that of an intact old-growth forest stand, whereas Steinblums et al. (1984) showed that in some cases buffer widths of 125 feet or more may be necessary to achieve this level of shading.

*Large woody debris* - Large woody debris (LWD) is an important link between terrestrial and aquatic ecosystems, acting on stream flows to create essential elements of salmonid habitat - pools, riffles, side channels, and undercut banks (Swanston 1991; Maser et al. 1988). Large woody debris causes lateral migration of the stream channel, creating backwaters along stream margins and increasing variations in depth (Maser et al. 1988). Large woody debris also serves as fish cover from predators and competitors (Bjornn and Reiser 1991), and this cover may creat

preferable microclimatic conditions as well. Large woody debris moderates the energy of stream flows, thereby decreasing streambed scour and bank erosion.

Large woody debris enters streams from a variety of sources, including: stream bank erosion, mass wasting, windthrow, tree mortality, and beaver activity (Bisson et al. 1987). Channel stability and longevity of LWD are assumed to be important for ecosystem function (Bisson et al. 1987). Stability is a function of size, with debris length relative to stream width having the greatest effect (Bisson et al. 1987). In-channel longevity of LWD is a function of both size and species: larger pieces are more resistant to breakage, and conifers are more resistant to fragmentation and decomposition than red alder (Bisson et al. 1987).

McGarry (1994) determined that 48% of the LWD in the mainstem of Cummins Creek, Oregon, came from upstream sources, primarily debris flows (a form of mass wasting). The valley width of Cummins Creek is relatively narrow, so that debris flows entering the valley would have a high probability of hitting the mainstem of the next higher order stream.

Both conifer and hardwood LWD are ecologically important to streams as habitat (Grette 1985); however, in many second and third growth forests, the relative proportion of hardwood LWD pieces has increased over time. This has been caused by past streamside logging and inchannel debris cleanout operations. For reference, western Washington LWD loadings average approximately 80% conifer and 20% hardwood (Bilby and Ward 1991).

*Sediment Filtering* - The live and dead vegetation within the riparian area filters out sediment from upland areas before it can reach stream channels (Wilford 1984).

*Downed Woody Debris* - Down woody debris (DWD) on the forest floor enhances conifer regeneration by acting as nurse logs. This may be important for re-establishing riparian conifer stands because saturated soils of some riparian areas may impede the regeneration of conifer species. Down wood is also essential for small mammal communities (Maser and Trappe 1984; Harmon et al. 1986). Carey and Johnson (1995) found that the abundance of small mammal species was related to the amount of dead and down wood in both managed and naturally regenerated stands. Downed logs provide numerous functions essential to wildlife including hiding and resting cover for amphibians, reptiles, rodents and larger mammals; a food substrate for fungi and invertebrates that become food for vertebrates; and den sites for small roaming carnivores (Knutson and Naef 1997).

*Snags* - Many kinds of wildlife are dependent on the close association of water and standing dead trees. These include cavity-nesting ducks, amphibians, raptors, and many mustelids. For example, wood ducks require large snags or live trees with cavities near water (Knutson and Naef 1997). Along large streams or rivers in unmanaged watersheds, snags may be more abundant and of better quality (i.e. large conifer species) in upper/outer portions of the riparian area than immediately next to the watercourse where disturbance encourages a younger, more deciduous forest community (Knutson and Naef 1997).

Independent of the association of snags with water, a wider community of animals are highly dependent on snags. This includes primary nesters (woodpeckers), secondary nesters (owls, Vaux's swifts and many other birds), and denning animals (squirrels, mustelids, and sometimes larger carnivores). Historic clearcut timber harvest practices have removed most snags. Contemporary upland forest practices (clearcut and thinning) routinely remove most or all second growth snags as part of standard safety practices. These safety practices are legally required and supercede wildlife habitat concerns. Thus, no-cut zones within the riparian buffer are a necessary part of the restoration of snag habitat and snag dependent species.

### **Wind Buffers**

The purpose of the wind buffer in the DNR HCP is to increase the stability, longevity, and ecological integrity of the RMZ. Stability and longevity of stream buffers has been an ongoing issue of concern in the Pacific Northwest (Steinblums et al. 1984; FEMAT 1993). A single wind storm could blow down entire sections of riparian buffer, or successive high wind events may, over longer periods, slowly degrade the integrity of the RE. Some windthrow, however, is vital to REs, because a significant proportion of in-channel LWD is blowdown (Murphy and Koski 1989; McDade et al. 1990). The aerodynamics of the abrupt forest edges which commonly occur between riparian buffers and clearcuts may cause more frequent catastrophic windthrow events or accelerated rates of blowdown.

Gratowski (1956) measured windthrow along the edges of clearcuts in western Oregon. He noted that most windthrow occurred within 200 feet of the edge between forest and clearcut and was concentrated in the first 50 feet. Excluding one extreme case of wind throw beyond 200 feet, Gratowski (1956) found that 77 percent of the blowdown occurred within 100 feet of the edge. Also, Gratowski (1956) observed that the amount of blowdown diminished by one-half for each successive 50 feet from the edge. Gratowski's studies took place only two years post-harvest, and therefore, he could not report on the continuing loss of standing trees over longer periods of time. Thomas et al. (1993) proposed a 100-foot-wide buffer to protect riparian buffers along fish bearing streams from wind and fire, and they did not explicitly propose a buffer to protect riparian buffers along non fish-bearing streams. Their proposal was intended to provide protection until a watershed analysis could be completed that would modify these interim buffer widths according to the characteristics of a given site.

While the body of scientific knowledge regarding wind buffer stability is growing (Mobbs and Jones 1995; Sherwood 1993; Rot 1993; Harris 1989), it is currently inadequate for designing a long-term conservation strategy. The wind buffer specifications of this HCP should be considered interim, and therefore, wind buffer width may change as research information concerning windthrow in managed forests becomes more available. Monitoring the success or failure of DNR wind buffers in maintaining the ecological integrity of RMZs, will be an important element of adaptive management under these procedures. Until new information on predicting wind hazard within riparian buffers becomes available, we have recommend using a formula in Steinblums et al. (1984). This formula

was developed for predicting buffer strip blowdown in forests of the southern Cascade Mountains of Oregon, and undoubtedly needs to be tested for situations encountered in Washington under widely varying conditions.

### **Riparian Wetlands**

Riparian wetlands provide functions critical to salmon and wildlife. In addition to providing off-channel habitat and food chain support, wetlands provide critical functions for the aquatic systems. Wetland hydrology can augment low flows and reduce high flows. Wetlands also maintain groundwater flows that provide clean, cool water to streams that support salmon and the web of aquatic life upon which salmon depend. Local stream hyporheic systems are fed by subsurface flows, and riparian forests play an important role in regulating soil and shallow groundwater temperatures and hydrology.

### **Mature Older Forest Condition (Maser et al. 1988)**

“The forest portion of the ecosystem is the sum of three diverse, mutually dependent components: physical structures, biological entities, and ecological functions. These components are dynamic, continually developing diversity.

Diversity develops in a forest as a result of changes that occur at different rates at different places. Disturbances cause relatively rapid changes in ecosystems, whereas succession slowly returns ecosystems to previous conditions or directs them to new states. Structural diversity in the current mosaic of forest age classes was created by a variety of disturbances, such as fire and wind, and this mosaic changes from succession and new disturbances. Today’s forested coastal landscape bears the legacy of many landscapes in the form of remnant old-growth trees, snags, fallen trees, landslides, and patches of young and mature forests.

The forest’s character changes with succession. Net primary productivity is greater in young forests than in older ones. Old forests conserve nutrients, whereas very young forests are susceptible to erosion and nutrient loss. Forests of the Coast Range Interior valleys produce less wood than do those on more moist sites nearer the ocean. Internally, the old unmanaged forest is more diverse than many young and mid-age forests. Old forests have deeper, multilayered canopies, larger accumulations of coarse woody debris (any dead standing or fallen free stem at least 4 inches in diameter at breast height (d.b.h.) on snags and at the large end on fallen trees), and more specialized plants and animals than young forests have.

A coastal Oregon forest may change slowly through growth, succession, mortality, and decay, or it may be altered rapidly by catastrophic disturbance. Whatever the agent of change, the imprints of previous forests and disturbances persist into succeeding forest generations. Organic material in the form of dead tree stems is one of the more persistent legacies. This material exerts ecological influences on a site for hundreds and thousands of years; first, as snags and fallen trees; later, as fine organic matter in the soil. These organic remains create seed germination sites, moisture reservoirs

during summer drought, sites of nutrient exchange for plant growth, habitat for forest organisms, and favorable soil structure” (Maser et al. 1988).

### **Riparian Vegetation Classification As A Tool For HCP Riparian Conservation Management (Provided by: Gerry Gorsline)**

A fundamental assumption underlying the HCP riparian management strategy is that the aquatic and riparian conservation goals will be met by restoring riparian ecosystems to their natural, fully-functioning state. The implicit question is: how will we know a natural, fully-functional riparian ecosystem when we see one? Recognition of different riparian vegetation habitat types will help to answer that question and provide one measure of riparian ecological integrity.

The concepts of site-specific riparian vegetation ‘habitat types’ and ‘association’ allows us to think more in terms of whole ecosystems, rather than individual species or communities, and the classification of natural vegetation types can provide an ecological basis for conservation management. Such a classification system can be used to improve communication within and across jurisdictional boundaries, standardize data collection, predict management effects, and develop management strategies. Classification of riparian vegetation in relation to valley segments and topographic position in a particular watershed will give better targets for restoration or mitigation projects. Riparian plant community classification can serve as a baseline for monitoring change and can be used in conjunction with assessment procedures and inventory processes already in place, including stream surveys, proper functioning condition assessments, ecological unit inventories and watershed analysis.

The use of plants as indicator species and the recognition that different sites support different plant communities with different resource values dates back to the 19<sup>th</sup> century. Plant communities are distributed in distinct and recognizable patterns that are repeated across the landscape based on site potential. The classification of these plant associations begins with the broad vegetation pattern based on dominant climax tree species and is referred to as the zone or series. The association is named for the “potential” or climax stage of successional development and takes its name from the dominant “climax” tree species and one or more associated understory “indicator” species.

The *Forested Plant Association of the Olympic National Forest* (Henderson 1989) is an example of a manual designed for identifying upland plant associations in the field and making decisions about management of that plant association in the context of forest health and diversity. Once the association is identified, this guide provides specific information relating the association to management, including community ecology, insect and disease relations, soil, environment, nutrient relations, or forest growth and yield.

Riparian vegetation communities can be correlated with the physical attributes of riparian systems such as stream morphology, soil characteristics, fluvial geomorphic surfaces and hydrology in order to describe ecological units along riparian to upland vegetation gradients. These units provide land managers with vegetation structures and composition potentials as they relate to the physical characteristics of individual riparian sites.

In this connection, it is interesting to note that 32 percent of the rare plants that occur in the range of the Olympic Experimental State Forest are located in riparian and wetland habitats, striking evidence that riparian areas provide a disproportionate share of habitat for listed plant taxa.

Riparian vegetation must be understood in the dynamic context of stream hydrology, fluvial geomorphology, soils, and successional processes. Factors that are important in explaining patterns and variations in riparian vegetation include fluvial position in relation to stream depth, stream size and morphology, surficial geology, and soil moisture. Herbivory has also been recognized as a factor influencing riparian plant communities on the western Olympic Peninsula (Chris Chappell, personal communication). Downed wood is also an important factor in the distribution of riparian plant communities. In the riparian zones, downed wood provides safe colonization sites away from flood and herbivory disturbance. Research conducted in riparian areas of the South Fork Hoh River found that 93 percent of conifer seedling regeneration was associated with downed wood (McKee 1982).

Riparian vegetation in the majority of western Washington has not been systematically classified or described, although efforts are now underway to begin that process. A recent Northwest Scientific Association symposium on the ecology of riparian vegetation represented an effort to establish baseline information on the structure, composition and classification of riparian vegetation. At this conference, Chris Chappell delivered a preliminary report on a project that has begun to classify and describe low-elevation riparian vegetation within the Olympic Experimental State Forest. Work is underway to collect data on understory and overstory plant species composition, fluvial geomorphology, stream condition, disturbance history, soils, and forest structure along selected stream reaches to provide the basis for a regional riparian vegetation classification system that can be used for riparian conservation management. Stream reaches adjacent to mature old-growth forests are being sampled. Within each stream reach, variable-size vegetation/soils plots are installed on fluvial surfaces and toe slopes and correlated with major environmental factors such as precipitation, valley geomorphology, floodprone position, soil texture/drainage, depth to seasonal high water table and herbivory. Preliminary work has resulted in identification of six major associations of unconfined alluviated valleys and eight major associations of incised and slope-bound valleys.”

## **TECHNICAL BASIS FOR SILVICULTURAL TREATMENTS IN RIPARIAN ZONES (Provided by George Wilhere, DNR HCP Monitoring Coordinator)**

### **Riparian Ecosystems**

Riparian ecosystems are the location of direct interaction between aquatic and terrestrial ecosystems (Swanson et al. 1982). Riparian ecosystems occur along rivers, streams, lakes, ponds, and other bodies of water. From water's edge to upland, a continuum of physical and biological characteristics often exists, and in the coniferous forests of the Pacific Northwest this continuum obscures a distinct boundary between riparian ecosystems and upland forests. Nevertheless, when defined functionally, the riparian ecosystem can be identified as a distinct area consisting of three zones – an aquatic zone, a riparian zone, and a zone of influence (Sedell et al. 1989, Naiman et al. 1992). The aquatic zone

is the wetted portion of the riparian ecosystem; the dimensions of which can change both seasonally (e.g., summer drought) and episodically (e.g., winter floods). The riparian zone is a band of hydric soils and hydrophilic vegetation that result from intermittent inundation and high water tables. The riparian zone may be nearly equivalent to the 100-year flood plain. Beyond the riparian zone lie uplands, and the spatial extent of direct effects upon aquatic ecosystems delineates the “zone of direct influence” (Figure 2).

Within a riparian ecosystem, interactions between aquatic and terrestrial ecosystems happen through energy and mass transfers (Bilby 1988 for review). Flowing water subjects stream banks to erosional forces that mobilize gravel, sediments, organic debris, and other materials. The result is a transfer of matter from terrestrial to aquatic ecosystems. During floods, a portion of these materials is returned to the terrestrial ecosystem through deposition of sediments and entrapment of organic materials. This particular process tends to enrich soils in the riparian zone. Forest canopies mediate the transfer of solar energy to aquatic ecosystems. The amount of shade over aquatic ecosystems affects water temperature which influences aquatic ecosystem processes (Beschta et al. 1987). Terrestrial vegetation also contributes energy and nutrients in the form of detritus or particulate organic matter. The numerous functions of LWD in aquatic ecosystems are well-documented and include: forming pools, storing and sorting sediments and gravels, retarding the transport of nutrients, creating cover for fish, functioning as substrates for biological activity, and serving as nurse logs in riparian forests (Bilby and Likens 1980, Bisson et al. 1987). LWD enter aquatic ecosystems through bank undercutting, windthrow, tree mortality, and landslides. Riparian forests also mediate the flow of materials from upslope terrestrial ecosystems to aquatic ecosystems. Unchanneled surface flow of water, sediments, and organic materials can be intercepted, retarded or filtered by porous soils, vegetation, and down woody debris. Even groundwater is altered as it flows under riparian areas toward the aquatic zone. In particular, riparian forests are known to regulate the chemical composition of groundwater reaching streams from upland areas (Bilby 1988, Naiman et al. 1992).

**Riparian Forest Ecology** - Riparian forests (those forests located within riparian ecosystems) have a tremendous influence on the ecological condition of aquatic ecosystems. Riparian forests are the source of many materials essential to the proper functioning of aquatic ecosystems (e.g., detritus, woody debris), and they mediate processes that input energy or materials to aquatic ecosystems (e.g., insolation, groundwater flow). Surprisingly, riparian forest ecology in the Pacific Northwest is a subject which has garnered little attention until relatively recently. Much more is known about in-stream LWD than about the forests which provide it. An extensive body of scientific literature concerning forest ecology in the Pacific Northwest exists (e.g., Franklin and Dyrness 1973, Waring and Franklin 1979, Topic et al. 1986, Spies and Franklin 1988, Henderson et al. 1989), but unfortunately, nearly all studies have addressed the ecology of upland forests. For example, in 1990 only four of all USDA Forest Service reference stands were located in riparian areas and plots in these reference stands had existed for less than 10 years (Gregory et al. 1990). At present, our conceptual understanding of riparian forests – seedling establishment, tree growth and survival, coarse woody debris dynamics, patterns of community succession, and rates of succession – are

simply assumptions based on knowledge of upslope forests (Gregory 1997).

Traditional floristic classification theories developed for uplands are difficult to apply in riparian areas (Kovalchik and Chitwood 1990). The suite of processes that govern plant community succession in riparian ecosystems are more complicated than those farther upslope, and the substrates upon which riparian vegetation grows are more diverse. Riparian forests are more dynamic than upland forests because they are subject to more types of disturbance. Like upland forests, riparian forests are affected by fire, windthrow, landslides, and tree diseases. Unlike upland forests, riparian forests are also subject to bank erosion, floods, debris flows, and intensive herbivory by beavers (Agee 1988, Gregory et al. 1991, Naiman et al. 1992). Community succession in riparian ecosystems is apparently renewed by fluvial disturbances which both builds and destroys soil. The deposition of sediments and organic matter enriches soil, but scouring can remove all soil leaving only bare rock and gravel. More significantly, natural disturbances are necessary for the creation and maintenance of salmonid habitat. Periodic catastrophic disturbances which cause local destruction of habitat are thought to be essential to the long-term maintenance of salmonid habitat within a watershed (Reeves et al. 1995, Bisson et al. 1997).

Across the bottom of wide valleys a transverse vegetational gradient is commonly observed. Underlying the vegetational gradient is a corresponding gradient in soil properties, especially soil moisture (Fonda 1974, Hawk and Zobel 1974). During periods of drought and low stream flow, younger soils are drier than older soils, which retain more moisture due to a higher content of organic material. Ironically, because of this age-dependent soil property, during the summer drier soils are nearer to the stream. Plants on younger soils must be drought tolerant. Red alder is adapted to the thin, young soils of riparian areas. The water table in riparian ecosystems is typically shallower than the adjacent upland forest, and this difference is particularly acute during winter when stream flows are highest. Water table depth influences the survival of tree seedlings: red alder and redcedar are affected little by water table depth; Sitka spruce does not tolerate stagnant, shallow water tables; western hemlock grows slowly on shallow water tables; and Douglas-fir cannot tolerate shallow water tables (Minore and Smith 1971).

Moving from the aquatic zone toward uplands, a sequence of distinct seral communities often exists on flood plains, low, medium, and high terraces, and on the hillslope. In the Hoh and Bogachiel River Valleys (Fonda 1974 and Agee 1988, respectively), seral gradients from stream to upland exhibit the following sequence of communities: (1) red alder, (2) black cottonwood-Sitka spruce, (3) Sitka-spruce-westernhemlock, (4) western hemlock or western hemlock-Douglas-fir. On slightly different landforms in the McKenzie River drainage, Hawk and Zobel (1974) found a different seral sequence of communities: (1) red alder, (2) grand fir, (3) Douglas-fir, and (4) western hemlock. Andrus and Froelich (1988) found that the species composition of riparian forests is related to the age of the forest and the landform where it is situated. They studied vegetation along streams in the central Coast Range of Oregon. The riparian areas had been disturbed by logging or fire or both 2 to 135 years before the study. By retrospectively documenting community succession, Andrus and Froelich (1988) showed that riparian forest understory changed from brush and herbaceous species to alder and salmonberry, and that the alder and salmonberry could prevent conifer establishment

on streamside terraces. In older forests (> 65 years), trees growing on terraces were predominantly alder while those growing on hillslopes were a mix of alders and conifers. These apparent associations of tree species with landform again demonstrate the transverse ecological gradient that runs across riparian ecosystems. These results were corroborated by Minore and Weatherly (1994) who reported that conifer basal area in riparian forests increased with distance from the stream and with time since disturbance. Hardwood basal area did not change significantly with distance from the stream but did decrease with height above the stream. Their study was also conducted in the Coast Range of Oregon.

A study of valley-floor forests on the Olympic Peninsula demonstrated that community succession does not always progress along elevational or landform gradients. McKee et al. (1982) found that forests on upper and lower floodplain terraces had very different species composition and structure but were the same age. The average age of trees in both stands was slightly greater than 200 years. However, the upper terrace had a higher tree density and greater basal area, but trees on the lower terrace had a larger average diameter. Both the stands were composed mainly of Sitka spruce and western hemlock, but western hemlock contributed significantly more to basal area in the upper terrace. Total shrub cover was twice as great on the lower than on the upper terrace. These results indicate that seral stage is sometimes unrelated to landform, but landform does play a role in forest composition and structure.

McKee et al. (1982) also found that conifer regeneration was strongly dependent on the presence of "nurse logs." A nurse log is a fallen dead tree on which tree seedlings become established. In the valley-bottom forests studied by McKee et al. (1982), 88 to 97 percent of tree seedlings grew on logs. Harmon and Franklin (1989) conducted an experiment to explain this dependence. They concluded that competition with herbs and mosses on the forest floor was responsible for the high proportion of conifer seedlings found on nurse logs. In valley-bottom alder forests of the Oregon Coast Range, Henderson (1978) observed some conifer regeneration in stands younger than 25 years; the conifer and alder were the same age. But, in stands 25 years or older he found conifer seedlings only on nurse logs. He speculated that understory competition and a high water table inhibited seedling survival except on rotted logs and other micro-mounds.

Structure and tree species composition of old-growth conifer forests in riparian ecosystems are different than old-growth conifer forests outside riparian ecosystems. Graham (1982), using the same plots as McKee et al. (1982), conducted a study of dead boles. She determined that only 6 to 11 percent of the forest floor was covered by dead wood. Graham (1982) stated that these values are somewhat lower than those recorded for upland forests (16 percent), and she thought the difference could be explained by (1) the immense Sitka spruce boles present in the valley-floor forest, (2) the low density of live stems in the valley-floor forest, and (3) the rapid decay rates of spruce and hemlock compared to Douglas-fir.

In southeastern Alaska, Hanley and Hoel (1996) found riparian old-growth forests had more large conifers (dbh >75 cm) than upland riparian forests – 52 stem/ha versus 26 stem/ha. Also, riparian forests were dominated by large Sitka spruce (40 stem/ha), but that upland old-growth forests were

characterized by a high density of smaller western hemlock (433 stem/ha). They also determined western hemlock was by far the most common sapling in upland stands, but that in riparian stands saplings were an even mix of spruce and hemlock. In a preliminary report, Gregory et al. (1990) presented data indicating that riparian old-growth forests contained about  $\frac{3}{4}$  the conifer basal area of upslope old-growth forests. Neither Hanley and Hoel (1996) nor Gregory et al. (1990) attempted to explain these differences.

Riparian forests tend to be older than upland forests (Sedell 1984). From a study of fire history in Mt. Rainier National Park, Hemstrom and Franklin (1982) reported that alluvial terraces and valley bottoms were often forested with old stands and that every major river valley contained a stream-side old-growth corridor. These observations support an inference that the moist environment of riparian areas inhibits fire and reduces the fire return interval for riparian forests. The moister environment may also advance the regeneration of more structurally complex forest following wildfire. Fires that burn across riparian areas may be less intense, and less intense fires would kill fewer trees and consume less coarse woody debris, both snags and logs. The persistence of live trees in riparian forests may also provide a local seed source that facilitates a more rapid development of a multi-layered, conifer-dominated forest (Poage and Spies 1996).

In summary, riparian forests should be understood as ecological mosaics correlated with particular landforms and maintained by recurrent fluvial disturbances. In combination, natural disturbances and local soil properties manifest multiple successional pathways, high plant species diversity, and complicated vegetational patterns both spatially and temporally (Naiman et al. 1998). Changes in floristic diversity occur along local elevational gradients and over the entire stream network due to different disturbance histories. West of the Cascade Crest, evidence suggests riparian forests are generally older, less dense, and possibly more structurally complex than surrounding uplands. Hence, at the watershed scale, riparian forests may be more stable and yet more dynamic than upland forests. This interesting paradox implies that riparian forests probably make a critical contribution to overall community diversity within a watershed – a contribution that is poorly understood.

Many natural resource managers currently believe that the viability of salmon stocks depends upon watersheds where the characteristics of riparian forests resemble those of unmanaged, natural forests. This leads to a fundamental question: how can we create, maintain, or mimic the characteristics of natural riparian forests in a managed watershed? For forest managers, this is a silvicultural question. The practice of silviculture is built upon the science of forest ecology. Unfortunately, our lack of knowledge and understanding about riparian forest ecology has compromised efforts to develop riparian silviculture.

### **Riparian Silviculture**

Silviculture is the science or practice of cultivating a forest stand to produce a desired condition. Silviculture entails applying a series of treatments to trees or shrubs over time. A “prescription” describes the details of a treatment or treatments. Riparian silviculture is a special application of silvicultural principles and practices to forests in riparian ecosystems. The salmon crisis in the Pacific Northwest has spurred considerable discussion (Hibbs 1987, Oliver and Hinckley 1987,

Sedell et al. 1989, Bacon 1990, Bilby and Bisson 1991, Swanson and Franklin 1992, Hayes et al. 1996, Gregory 1997) and some research (Rainville et al. 1985, Berg 1995, Chan et al. 1993, Emmingham and Maas 1994, Maas and Emmingham 1995, Emmingham and Hibbs 1997) regarding various aspects of riparian silviculture. Current silvicultural research in riparian areas usually addresses the most common problem exhibited by salmonid habitat in managed watersheds – the capacity of forests to supply in-stream LWD. Aquatic ecosystems on private and state managed forests lack the in-stream LWD essential for salmonid habitat, and riparian forests lack the capacity to supply LWD in the near future. The reasons for this situation are two-fold. First, forest practices rules have provided inadequate protection of riparian forests. As a result, riparian forests have been destroyed. Second, decades ago, in-stream LWD was eliminated from many aquatic ecosystems through practices such as splash damming and the cleaning of streams for fish passage (Sedell et al. 1988). In response to the salmon crisis, riparian forest restoration has been promoted for managed forests throughout the Pacific Northwest, and riparian silviculture is the tool through which restoration will be accomplished. However, riparian silviculture poses difficult problems for which there are currently no reliable solutions. While some research addressing these problems have been conducted there is inadequate scientific information with which to confidently design silvicultural prescriptions. Consequently, silvicultural treatments for riparian forests are actually hypotheses; hypotheses which should be tested.

The goal of restoration is to reestablish an ecosystems's ability to maintain its function and organization without continued human intervention. Therefore, "riparian forest restoration" entails the cultivation of a forest that functions to supply materials essential to aquatic ecosystems and to mediate processes that transfer energy or materials to aquatic ecosystems. This is often assumed to mean that the forest must possess a structure and species composition that resembles unmanaged forest. However, a succinct definition of the archetypal unmanaged riparian forest is elusive. A more ecologically realistic approach to restoration recognizes that riparian forests are dynamic and diverse. Riparian silviculture should aim to maintain the range of conditions produced by natural disturbance regimes and encourage natural patterns of succession (Bisson et al. 1997, Gregory and Bisson 1997). Unfortunately, we currently lack the knowledge necessary to accomplish these aims.

There are two basic situations that might motivate the restoration of a riparian forest. These situations are characterized by different stand conditions and involve different silvicultural treatments. First, a riparian forest dominated by deciduous trees, typically alder, might be manipulated to bring about a "conversion" to coniferous trees. The ultimate objective is to cultivate a forest that contains large diameter conifers. This type of restoration is thought to be appropriate at many sites because old conifer stumps clearly show that these sites were once occupied by a conifer forest and that the alder-dominated riparian area is the aftermath of past forestry practices. Furthermore, these sites often have a shrub understory (e.g., salmonberry, vine maple) and there is a potential for the riparian area to develop a long-lasting shrub community after the alder sensesces (Hibbs and Giordano 1991). The shrub community might inhibit the regeneration of conifer trees for many decades. "Conversion" treatments often entail partial or complete removal of the deciduous overstory, planting of conifer seedlings, and control of understory vegetation. When developing conversion treatments, foresters should consider that red alder may be beneficial to

conifer growth by increasing soil nitrogen. Deal (1997), during a study of mixed alder-conifer riparian forests in southeast Alaska, found that stands with relatively equal stocking of conifer and alder contained the largest diameter conifers.

Second, a riparian forest of tightly spaced, small diameter conifers might be thinned to accelerate tree diameter growth, thereby decreasing the time until large diameter wood is delivered to the stream. A riparian forest of this type is typically a legacy of clearcut timber harvest that occurred 20 to 50 years ago. Thinning to accelerate diameter growth is a common silvicultural treatment and the response of stands to thinning is well understood. However, nearly all silvicultural research on thinning has been conducted in upland forests. While there is little risk that trees won't respond in the manner expected, i.e., accelerated diameter growth, there are other risks which are unique to forest management in riparian areas. For instance, increasing the rate of windthrow is a risk. Altering the rate of windthrow alters a critical interaction between terrestrial and aquatic ecosystems – the recruitment of in-stream LWD. Windthrow risk is difficult to assess because the factors affecting windthrow are poorly understood. Surprisingly, creating a riparian forest that is too stable is also a risk. Conventional thinning is done to reduce mortality, but in riparian ecosystems mortality is essential to the LWD recruitment process. Conceivably, thinning could create a riparian forest that resembles an unmanaged forest but delivers less LWD.

The silvicultural treatments discussed in these HCP Riparian Management Procedures act primarily on two stand characteristics: species composition and stand density.

**Species composition** was addressed because of the large difference between hardwoods and conifers in their ability to meet long-term large woody debris needs in streams. Riparian zones dominated by hardwoods are thought to have poor prospects for supplying functional large wood to the stream in the long-term, largely due to the rapid decay rates of these woods. Therefore, in cases where the majority of a stream's riparian zones are hardwood dominated, the procedures suggest replacing some of the hardwood stands with conifer stands, provided the site will support conifer stands. The fastest and most certain way to do this is to cut the hardwood and plant conifer. Riparian areas in western Washington are usually very competitive sites; creating a very open environment and planting vigorous seedlings gives the best probability of successful conifer establishment and growth.

There is no intention in the procedures to eliminate hardwoods and create exclusively conifer stands. Although hardwoods may not be adequate for meeting large wood needs, they serve important roles for wildlife habitat and nutrient cycling. Therefore, even on streams which are dominated by hardwoods, the conversion to conifer occurs only in alternating blocks, leaving blocks of hardwoods in between. And in mixed hardwood-conifer stands, some hardwoods are removed to release conifers, but other non-competing hardwoods are left.

**Stand density** management is the primary tool suggested in these procedures to accelerate the development of older stand characteristics in riparian zones, and is accomplished primarily through thinning (Berg 1995). Thinning results in a reallocation of growing space among trees or between

trees and other vegetation. The space occupied by the cut trees becomes available to whatever vegetation is able to take over that space. After light thinnings, where few trees are removed, most of the reallocation occurs between dominant trees. The crowns close quickly, and not much space is left for understory vegetation. With heavier thinnings, where more trees are removed, the dominant trees cannot immediately reoccupy all of the additional space, so there is more space available to stimulate growth in understory trees, shrubs and other plants.

There are a number of measures of stand density, but the one used in these procedures is *relative density* (Curtis 1982). Relative density (RD) is an index that compares the density of the stand being measured to the maximum theoretical stand density, and is calculated by dividing the stand basal area per acre by the square root of the quadratic mean stand diameter. This measure is particularly useful because it is easily calculated from simple field measurements and the interpretation of RD values does not vary for practical purposes with stand age or site quality. This is in contrast to other measures, such as basal area, trees per acre, or volume per acre, which are influenced significantly by both stand age and site quality.

RD values above 55 indicate that the stand is becoming dense enough to begin to expect tree mortality due to suppression. Stands in this condition typically have poorly developed understories, because the overstory trees are occupying nearly all of the growing space. The trees also begin to develop large height to diameter ratios, which reduces their windfirmness; this can be partially important if the stand is subsequently thinned or exposed by cutting in an adjacent area. Typical relative densities for maximum timber production would be in the range of 35-55. For rapid development of older forest characteristics, which would include large diameter trees and a well-developed understory structure, stands should be thinned to less than RD 35 (Hayes et al. 1997).

The procedures recognize that dense stands without developed understories are also valuable for some kinds of wildlife, and for that reason not all stands are to be thinned. A mixture of thinned and unthinned stands will help create a diversity of habitat conditions across the landscape.

## RECOMMENDED RIPARIAN MANAGEMENT PROCEDURES

The management procedures that are described below will be followed when carrying out forest management activities in RMZs on DNR HCP lands, within the Five Westside Planning Units. Due to past forest management applications, the riparian ecosystems (REs) within the DNR Five Westside Planning Units (western Washington outside of the OESF) are in a wide variety of conditions, including everything from early seral stages of managed and unmanaged forests all the way to the old-growth state. In order to meet the conservation objectives set forth in the DNR HCP, it will be necessary to manage RMZs very differently than they have been managed in the past. **When REs are encountered during forest management activities, the restoration and maintenance of the habitat of salmonids and riparian obligate species is of the highest priority. Per the DNR HCP, RMZs will be left on Type 1, 2, 3, and 4 Waters; and unstable slopes will be protected on all Type 1-5 Waters.** Management activities will be allowed within the RMZs

along Type 1-4 Waters, however, they should be primarily directed toward meeting the riparian conservation objectives of the HCP. Forest management activities in RMZs shall conform to the following:

1. **Site Specific/Adaptive Management** - All management within RMZs will be site specific, i.e., tailored to the physical and biological conditions at a particular site. It is anticipated that management in RMZs will be mostly silvicultural; however, it is also known that many other kinds of management activities also occur in these areas and will need to compensate for these procedures (i.e., campgrounds, gravel pits, recreation trails, brush cutting, mushroom picking, utilities right-of-ways, etc). Management activities in RMZs shall maintain or restore the quality of salmonid and wildlife habitats, but, due to variation in site conditions the intensity of management will vary. The DNR HCP Research and Monitoring Committee will evaluate how well site-specific results of applying these procedures meet the riparian conservation objectives. Scientifically-valid monitoring of these activities will require controls and randomized sampling. Forestry activities will be randomly selected for monitoring, and a small portion of the riparian buffer will be randomly selected to serve as an untreated control area.. Monitoring of the effectiveness of the riparian protection measures will be based on the procedures described in Smith (1998).

2. **Riparian Management Goal** - DNR plans to work toward a general goal of achieving older forest conditions in RMZs of all DNR lands in the 5 Westside Planning Units. It is recognized that this goal may not be entirely attainable in the first rotation, however, it is a target condition to work toward. Riparian management zones are disturbance driven ecosystems and hardwoods are an important part of these kinds of stands. Figure 4, from the DNR HCP (page IV.60), is not based on actual field data; however, it visually represents what we want the relative conifer to hardwoods seral-stage composition within RMZs to look like by the year 2095. With the exception of site restoration, once a riparian forest is on a management trajectory to attain the goal of mature older forest conditions, there should be no further harvest within that RMZ.

3. **Water Type Verification** - Water type verification will occur using certified and/or trained regional personnel or their designates, using the most current State Forest Practices Protocol. All water typing verification must be completed before defining an RMZ boundary, to ensure it is based on accurate water type information. (**Water Types are defined in WAC 222-16-030**).

4. **100-Year Floodplain<sup>1</sup>** - All measurements of RMZ widths start at the outer edge of the 100-year floodplain. For this document, the 100-year flood plain outer edge, is determined by measuring 2 times the average depth of the ordinary high water mark, extended horizontally to a point on the ground at either side of the stream (Dunne and Leopold 1978, page 648).

5. **RMZ Outer Boundary** - The RMZ outer boundary on Type 1-3 Waters is an average of 1 site

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<sup>1</sup>For this document we are equating the 100-year floodplain to the channel migration zone (CMZ).

potential tree height (SPTH) distance at breast height age 100 years, or 100 feet, whichever is greater; and 100 feet on Type-4 Waters. All measurements are made horizontally starting from the outer edge of the CMZ (100-year floodplain).

**A. Type 1-3 Waters** - To determine SPTH at breast height age 100 years, use site indices from the Planning and Tracking (P&T) Soil Feature Work Maps and Soil Reports. To determine the site index, use the following procedure:

**Step 1.** Use the P&T Work Map Soil Feature and Soils Report to determine the first conifer growing site upslope from the stream. Conifer soil types are those with Douglas-fir or western hemlock as the first major tree species. Use the P&T Soils Report to identify the tree species and site index for this soil type. Use the tree species-site index with the procedure described in Step 3, to determine the width of the RMZ.

**Step 2.** For each soil type, determine the site potential tree height at breast height age 100 years with the tree species-site index from Step 1 (above) using the appropriate site index table below:

- 1.) Douglas-fir, use the James King 50-year Site Index Table (Table 1).
- 2.) If western hemlock, use the James Flewelling 50-year Site Index Table (Table 2).

**Step 3.** The width of the RMZ shall be uniform within a particular timber sale unit, even when the forest management unit has 2 or more soil types along the Type 1-3 Waters. The uniform width shall be calculated as the weighted average of the site potential tree heights at breast height age 100 years for the soil types, weighted by the proportion of their distance along the stream channel.

Table 1. Douglas-fir Site Index Table (adapted from James King 1966).

50 yr. Site Index	70	80	90	100	110	120	130	140	150
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Height At Breast Height Age 100	98	112	127	142	157	172	188	203	218
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Table 2. Western Hemlock Site Index Table (adapted from James Flewelling 1994).

50 yr. Site Index	70	80	90	100	110	120	130	140	150
Height at Breast Height Age 100	111	122	133	144	156	168	181	194	208

**B. Wetlands Located Within an RMZ.** Riparian wetlands: both forested and non-forested wetlands within the designated RMZ shall be protected by a buffer. Riparian wetlands that are larger than 1 acre shall have a buffer width equal to the site potential tree height at breast age 100 years. Non-forested riparian wetlands less than 1 acre shall have a 100-foot-wide buffer. Forested wetland tree canopy shall be fully retained. Any silvicultural treatments in riparian wetland buffers shall maintain a minimum basal area of 120 square feet per acre. “The purpose of the leave trees is to maintain a canopy and large root systems for the uptake and evapotranspiration of ground water, in order to preserve the natural hydrology of the wetlands.” (Bigley - In draft report entitled: Managing Wetlands on State Lands in Washington). Wetland systems that occur within the RMZ may extend beyond that zone into the upland environment. That portion of the riparian wetland system that extends beyond the designated RMZ shall be managed in accordance with the standard HCP wetland protection guidelines (HCP page IV-69).

**6. General Sub-Basin Level Assessment of Riparian Conditions -**

It is important to perform an assessment of the riparian stand conditions on a sub-basin level before initiating RMZ management activities. In this assessment, consider state lands up to a distance of approximately 1 mile both up and down stream from the proposed activity, or to the mouth of the sub-basin within which you are working, whichever is less. If there is not enough distance upstream (e.g., if the headwaters of the stream or the boundary of state lands occurs less than 1 mile upstream), then increase the distance downstream to maintain a total of 2 stream miles in the assessment or to the edge of the sub-basin. The goal is to characterize the dominant stand in the area. If your harvest unit contains the only hardwood dominated RMZ in the area being assessed, then hardwood to

conifer conversion is not advised. Consult the Washington State Forest Practices Watershed Analysis Methodology for details on how to determine the conifer/hardwood mix.

7. **Establish RMZ Areas** - Subdivide the RMZ into 3 areas (**inner, middle, outer**) on Type 1-3 Waters (Figure 5-A), and into 2 areas (**inner and outer**) on Type-4 Waters (Figure 5-B).

A. **Inner Area** - The inner area is determined by horizontally measuring out 25 feet from the outer edge of the CMZ.

B. **Middle Area** - The middle area is determined by horizontally measuring out 75 feet from the outer margin of the Inner Area.

C. **Outer Area** - The outer area is determined by horizontally measuring from the outer edge of the middle area out to the remainder of the SPTH width on Type 1-3 Waters, or from the outer edge of the inner area out to a total of 100 feet on Type-4 Waters.

8. **Establish Tree Species Cover Composition** - Divide the RMZs into segments based on similar forest cover types, by determining the relative percent canopy cover of conifer and hardwood. Categorize each segment as one of the following three forest stand types: **conifer** (>70% conifer), **mixed** (30-70% conifer), and **hardwood** (<30% conifer). (See the Riparian Module of the Washington Forest Practices Board Watershed Analysis Manual for procedure.)

## 9. Riparian Management Applications -

When planting a new stand and thinning an existing stand in RMZs, we should strive for a mix of native conifer species appropriate for the site. Strive for a mix of conifer species appropriate for the site. The goal should be for a multistory canopy, with the promotion of advanced regeneration.

Skyline yarding through the RMZ is allowed if it can be demonstrated that by doing so haul road densities are reduced for individual sales or for the landscape. Full suspension shall be required where possible. Yarding corridors will be kept to a minimum in numbers and width. Line whip shall be kept to no more than 10% of buffers within the harvest unit boundary, and yarding roads shall be located in natural voids where possible.

Low ground impact activities (i.e., horses, low ground pressure machinery, etc.) will be allowed for thinning, riparian and stream habitat restoration, trail building activities within the inner and middle RMZ areas, however, high ground pressure equipment will not be allowed in RMZs.

It is expected that in most cases RMZ silviculture will coincide with simultaneous forestry

management in adjacent uplands.

**A. Inner Area All Stands-** There should be no commercial timber harvest in the inner area, only limited forest restoration activities will be allowed. Except for road crossings, no high ground pressure equipment is allowed in this area. Riparian and stream restoration work should be carried out with low ground pressure equipment, cable systems, or helicopter.

The kinds of rehabilitation techniques to be applied in the inner area are: 1.) release of suppressed understory conifer on a tree by tree selective basis, 2.) supplementation of DWD loadings on the forest floor to benefit riparian obligate species and provide a seed bed for conifer germination, 3.) restoration of LWD in the stream channel to benefit salmonid habitat, and 4) under-planting of shade tolerant species such as western red cedar and Sitka spruce. Restoration of in-channel salmonid habitat should be carried out under the supervision of trained habitat rehabilitation specialists (See riparian and aquatic restoration section below).

**B. Middle Area Conifer Stand -** Until this riparian forest is on a trajectory to achieve older forest conditions, DNR anticipates that only ecosystem restoration and selection removal of single trees (i.e., thinnings, pole sales) will occur. Except for road crossings, no high ground pressure equipment is allowed in this area. Restoration work should be carried out with low ground pressure equipment, cable systems, or helicopter. This is an area where the goal is to create a range of forest conditions across the landscape. Some middle areas should be more heavily thinned, while others should be maintained in a more dense condition. Leave patches of trees in areas that are rich with snags. This forest condition should eventually result in both DWD for the forest floor through suppression mortality, and a LWD recruitment source for the stream channel. Removal of thinned trees would be allowed only after DWD recruitment targets are met (Table 3). Forty percent of the conifer stands in a sub-basin should be left unthinned to create a variety of stand conditions on the landscape. For example a sub-basin would be on the order of a couple square miles in area.

1.) If thinning is an option then thin to a conifer relative density (RD) of 35-40 (Figure 6), or 50 t.p.a., whichever results in the greatest number of trees. The thinning must result in a stand of higher mean diameter than the existing stand. For younger stands age 10-15 thin to a conifer density of 150-200 t.p.a.

2.) Thinning of the middle area will cease when the upland stand is clearcut and replanted with a new stand of conifer; because of operational considerations of working over a young seral stage stand.

**C. Middle Area Mixed Stand -** If conifers are not suppressed by hardwoods then leave the stand alone; however, if there are large patches of dense conifer then these can be treated similar to conifer stands. If shade tolerant conifers are suppressed, consider removing or

girdling those hardwoods which are overtopping or competing with the suppressed conifers. Leave hardwoods that are not directly competing with conifers, using best professional judgement in determining appropriate actions and responses.

**D. Middle Area Hardwood Stand** - If the upstream/downstream forest landscape assessment indicates that on a sub-basin level there is greater than 20% hardwoods in the RMZ, then consider conversion to conifer as follows:

1.) Cut all hardwoods in 300 to 500 foot RMZ segments. If the outer area is a conifer stand, then the middle area may be left alone due to operational considerations. Openings in the RMZ shall be spaced with uncut segments which are a minimum of 200 feet in length. All live conifers must be retained in both the cut and no-cut patches. Treat brush competition where needed, plant 250-350 conifer t.p.a. using a mixture of species.

a.) Continue to control brush where needed until conifer trees are free to grow. Applications of appropriate chemicals should be applied manually, not aerially.

b.) At about stand age 10-15, thin to reduce conifer density to 150-200 t.p.a..

2.) Do not convert hardwood stands if it is determined that:

a.) The site is not conducive to conifer growth (i.e., based on the lack of conifer stumps or regeneration, and presence of dense riparian shrubs).

b.) The site is among the top 25% of the hardwood stands, based on tree diameter in the assessment area.

c.) If the upstream/downstream forest landscape assessment reveals that the forest stand should be retained in the present condition in order to provide a mixture of conifer/hardwood conditions across the landscape.

**E. Outer Area** - The goal of harvest in this area is to create both older forest conditions and an abundance of large diameter conifer trees for future LWD recruitment to the watercourse. Management activities in this area will include the following:

1.) Aggressive thinnings to accelerate conifer diameter growth.

2.) There should be conversion from hardwood stands to conifer stands with older forest conditions, when appropriate for the site.

3.) Supplementation of DWD abundance on the forest floor to meet loadings found under older forest conditions (Table 3). There should be no tree removal in this area until the DWD goals are met in the area of RMZ within the timber sale boundary.

4.) Ground disturbance should be kept to a minimum.

**F. Outer Area Conifer Stand** - The goal of managing a conifer stand in the outer area is to maintain a density which encourages larger diameter growth of conifers. Thinning is the primary method for accelerating conifer diameter growth. In some instances, where a stand still is not on a trajectory to develop a mature forest condition, more than one thinning may be necessary. In these instances, the following methods should be used:

1.) Thin to reduce conifer density to 150-200 t.p.a., at about age 10-15.

2.) When conifer trees are larger, and commercial thinning is being done on adjacent uplands, thin to an RD of 30 (Figure 6) or 50 t.p.a., whichever results in the greater number of trees. The thinning must result in a stand of higher mean diameter than the existing stand.

3.) Trees that have been removed during the thinning process, that are in excess of the DWD and/or LWD restoration needs, may be taken to market.

**G. Outer Area Mixed Stand** - The goal of managing a mixed stand is to favor the diameter growth of conifers for LWD recruitment, while maintaining some hardwood component. If hardwoods are not directly competing with conifers then consider leaving the stand alone. However, if it is determined that conifers are suppressed, consider removing overtopping or competing hardwoods.

**H. Outer Area Hardwood Stand** - The goal of managing hardwood stands in the outer area is to change the long-term development of the stand from hardwood to mature conifer. This should be accomplished by doing the following:

1.) Cut all hardwoods. Treat brush competition where needed, and plant 250-350 conifers per acre.

2.) Continue to control brush where needed until trees are free to grow.

3.) At about age 10-15, thin to reduce conifer density to 150-200 t.p.a.

4.) When conifer trees are larger, and commercial thinning is being done on adjacent uplands, thin to a conifer RD of 30 (Figure 6) or 50 t.p.a., whichever results in the greatest number of trees. The thinning must result in a stand of higher mean diameter than the existing stand.

10. **Wind Buffers** - An outer wind buffer shall be applied on the windward side(s) of Type 1-4 Waters in areas that are prone to windthrow. Use the Steinblums et al. (1984) (See Attachment A) windthrow formula to determine windthrow hazard. If the windthrow hazard is high leave a 100 foot wide wind buffer; if the hazard is moderate, leave a 50 foot wide wind buffer; if the hazard is low then a wind buffer is probably not necessary. There should be no harvest in the wind buffer, even trees that have blown down; because they are now providing habitat for wildlife. The main purpose of the wind buffer is to act as a wind shield for the RMZ. The technique suggested by these procedures for leaving wind buffers, and for windthrow in RMZs without wind buffers, will be monitored for effectiveness by the HCP Research and Monitoring Committee.

11. **Additional Procedures** -

A. The area within RMZs that is taken up by new haul roads, utilities rights-of-way, campgrounds, gravel pits, recreational trails, bridges, etc., should be mitigated for by adding additional equivalent area to the RMZ. This should be part of a comprehensive regionwide road management plan. These activities will require on-site mitigation that is equal in acreage and function. Special care should be taken with these activities to minimize potential adverse impacts to the RMZs. Other management activities within the RMZs will require approval by the Regional Manager or designee for the specific DNR region that the activity is proposed for.

B. Yarding corridors through RMZs should be minimized; but they are preferred over new haul road construction. If yarding corridors are not avoidable, care will be taken to minimize the impact of these kinds of activities to RMZs. Trees that are damaged in the RMZ during these operations will be allowed to remain on site as live trees, snags, or DWD. Procedures for providing yarding corridors in RMZs are no more than 10% of the lineal distance of the RMZ within the timber sale unit boundary.

C. A commitment to multiple thinnings in RMZs is helpful for creation of riparian obligate habitat; but it also could commit us to keeping more access roads open longer. We suggest that managers look at this issue in their riparian/road analysis procedures, too, so as not to inadvertently keep more roads open than is necessary. Foresters should ask themselves this question: When is it better to just “walk away” from a poorly vegetated riparian area, because closing access roads to that area is a better environmental option?

D. The goal of green tree retention requirements for wildlife is to create patterns of leave trees in the upland area. Green tree retention requirements are in addition to trees left within RMZs. Riparian trees do not count toward the 8 trees and/or snags per acre required in procedure PR-HCP-010.

## RECOMMENDED RIPARIAN AND AQUATIC RESTORATION PROCEDURES

1. **Gather Information About The Particular Site** - Restoration activities on HCP lands outside of the riparian management manipulations covered above, are discretionary. However, restoration activities are encouraged when costs to trust beneficiaries are minimal. Implementation of the HCP riparian and aquatic restoration procedures should rely on existing information available for the site (i.e., State Forest Practices Watershed Analysis). Maps, aerial photographs, and field investigations should be used to make determinations of site conditions. The following are some steps to follow are:

**Step 1.** Accumulate existing information on the condition of the riparian ecosystem relative to channel condition, streambank integrity, shade, LWD loading and recruitment potential, DWD loading. Consider, for example, if the riparian ecosystem will supply appropriate amounts and sizes of LWD and DWD in the foreseeable future. If the riparian forest is in a young successional age class and/or the stream LWD loading is low, then placement of LWD in the channel may be in order.

**Step 2.** Use maps, aerial photographs, and field observations in the following ways:

A) Use aerial photography and other pertinent information to characterize the riparian ecosystem, based on: species, seral stage, width of riparian area, and density of riparian vegetation.

B) Identify the stream with aerial photographs, and attempt to classify reaches using gradient and valley confinement. Use the criteria provided by the Stream Channel Assessment of the State Forest Practices Watershed Analysis Handbook (1997, version 4).

C) Use a ground-based field investigation to further characterize the riparian vegetation condition, presence of fluvial surfaces (i.e., terraces), degree of slope, and determine the DWD and LWD loadings in the sale area.

D) Determine presence of wetlands through the National Wetland Inventory and U. S. Geological Survey topographic maps and aerial photography and/or your own ground verification.

E) Put in P&T for monitoring and tracking.

F) Update Geographic Information System with changes.

**Step 3.** After collecting information about the riparian ecosystem condition, consult with salmon habitat rehabilitation specialists to define and schedule appropriate in-channel habitat

restoration activities. Consult with specialists with the DNR, WDFW or appropriate Western Washington Indian Tribes for salmon habitat rehabilitation advice on particular river basins.

2. **Make a Down Woody Debris Assessment** - Count the number of individual DWD pieces (material >4 inches diameter and 6.5 feet long<sup>2</sup>) within the RMZ area, and compare the sizes and relative number to Table 3. If the site is significantly under stocked, either in the appropriate size or number of DWD pieces, consider supplementation. Make the DWD counts in conjunction with the RD measurement plots.

Table 3. Number of Downed Woody Debris on the Forest Floor Per Acre by Diameter Class (Spies et al. 1988).

	Diameter Class			Total
	<1 foot	1-2 feet	>2 feet	
Number of Logs (per acre)	85	83	26	195

3. **Make a Large Woody Debris Assessment** - Count the number of LWD pieces per channel width (material >4 inches and >6.5 feet long) using assessment distances suggested in Table 4, within and upstream of the sale area. Use the assessment distance suggested in Table 4, and the target conditions in Tables 5, 6, and 7. If the site is significantly under stocked with the appropriate number and sizes of LWD pieces, consider rehabilitation. You must consult with a trained salmon habitat rehabilitation specialists and the decision matrix discussed in Attachment B (Dominguez and Cederholm, In Preperation).

Table 4. LWD Assessment Distance

Channel Width (feet)	Assessment Distance (feet)
<15	500
16-40	1000
>40	5000

Table 5. Recommended Target Numbers of LWD Pieces for Stream Channels (pieces/channel width) (Bilby and Ward 1989, as cited by Peterson et al. 1992).

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<sup>2</sup>Based on length of an LWD piece.

Channel Width (ft.)	13	23	33	43	53	62
No. LWD Pieces/Channel Width	2.44	2.28	2.19	2.12	2.07	2.03

Table 6. Number of Key LWD Pieces per Bankfull Channel Width (State Forest Practices Watershed Analysis Protocol 4.0, November 1997, Appendix F - Fish Habitat, Table F-2).

Channel Type	Life Phase Influenced	Habitat Quality		
		Poor	Fair	Good
BFW <33 feet	Summer/Winter Rearing Habitat	<0.15	0.15 thru 0.30	>0.30
BFW 33-66 feet	Summer/Winter Rearing Habitat	<.20	0.20 thru 0.50	>0.50

\* BFW = bankfull width

Table 7. Definition of Minimum Size of Key Pieces for a Given Channel Width (State Forest Practices Watershed Analysis Protocol 4.0, November 1997, Appendix F - Fish Habitat, Table F-3).

BFW (feet)	Log Diameter (feet)	Log Length (feet)
0-16	1.3	26.2
17-33	1.8	32.8
34-49	2.1	59.0
50-66	2.3	78.7

### SOME SUGGESTIONS FOR RESEARCH

This scientific committee has identified a few areas of research that we recommend be undertaken to improve these management procedures:

- (1) **FEMAT (Federal Ecosystem Management Analysis Team) Curves** - With respect to protection of the riparian ecosystem, there is a need for increased knowledge on the applicability of the FEMAT curves in determining riparian ecosystem effects on streams as a function of buffer width (See Figure 3, this report).

- (2) **Riparian Management Zone Width** - What is an appropriate RMZ width for various sized streams, to meet the needs of both fish and wildlife? There is a need to further define the relationships between riparian buffer strip widths and their ability to maintain riparian ecosystem functions, particularly as they relate to salmonid and obligate wildlife habitat protection.
- (3) **Wind Buffers** - There is a need for a method to predict the degree of RMZ blowdown under a variety of ambient landscape conditions; and whether silviculture within the wind buffers will improve their effectiveness.
- (4) **Site Potential Tree Height Age** - What site potential tree breast height age (50, 100, 200, 300 years, ?) is most appropriate for determining the RMZ width? Also, there is a need to develop curves that allow determination of site potential tree height for the various conifer species, at ages beyond 100 years.
- (5) **RMZ Buffer Management, or Not** - We are assuming that silvicultural management within RMZs is the best way to achieve restoration of older forest conditions and riparian ecosystem function. Is there another more effective way?
- (6) **Restoration** - What constitutes appropriate DWD and LWD rehabilitation in managed RMZs.
- (7) **Plant Classification** - Develop riparian plant classifications for the five westside planning units.
- (8) **Riparian Silviculture** - Develop techniques of under planting of shade tolerant conifer species (i.e., western red cedar, Sitka spruce, etc.) in hardwood dominated stands.

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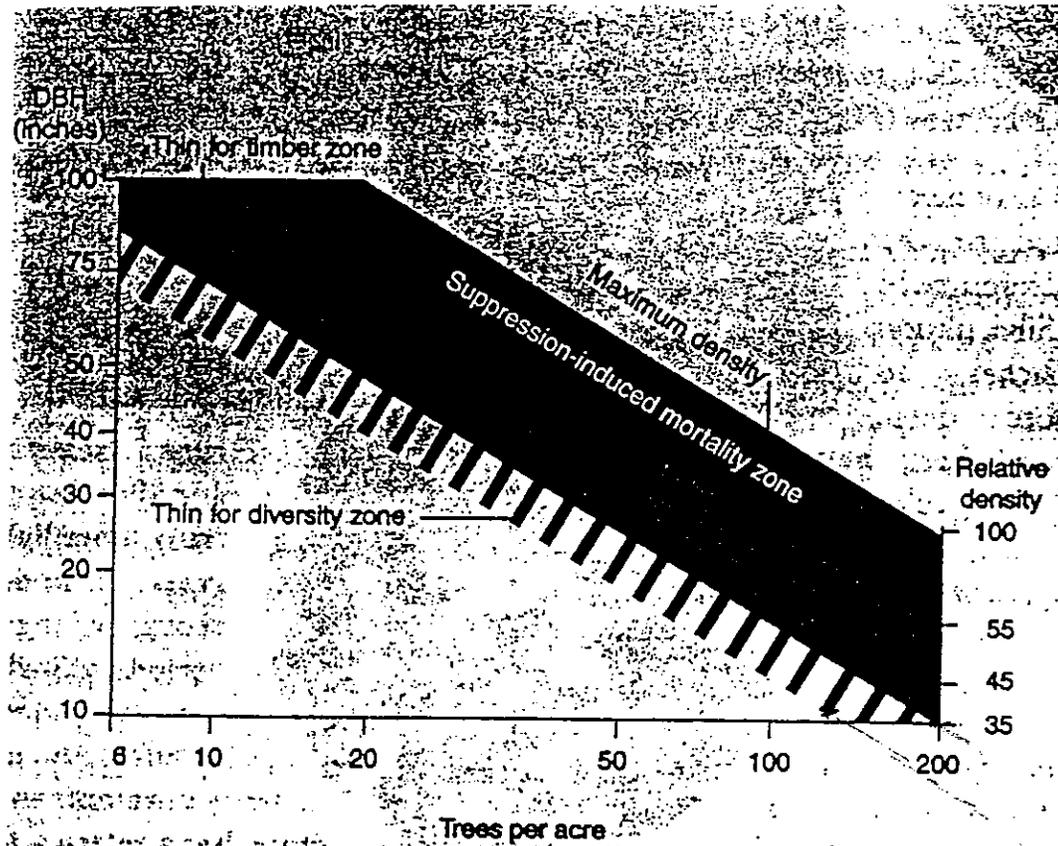
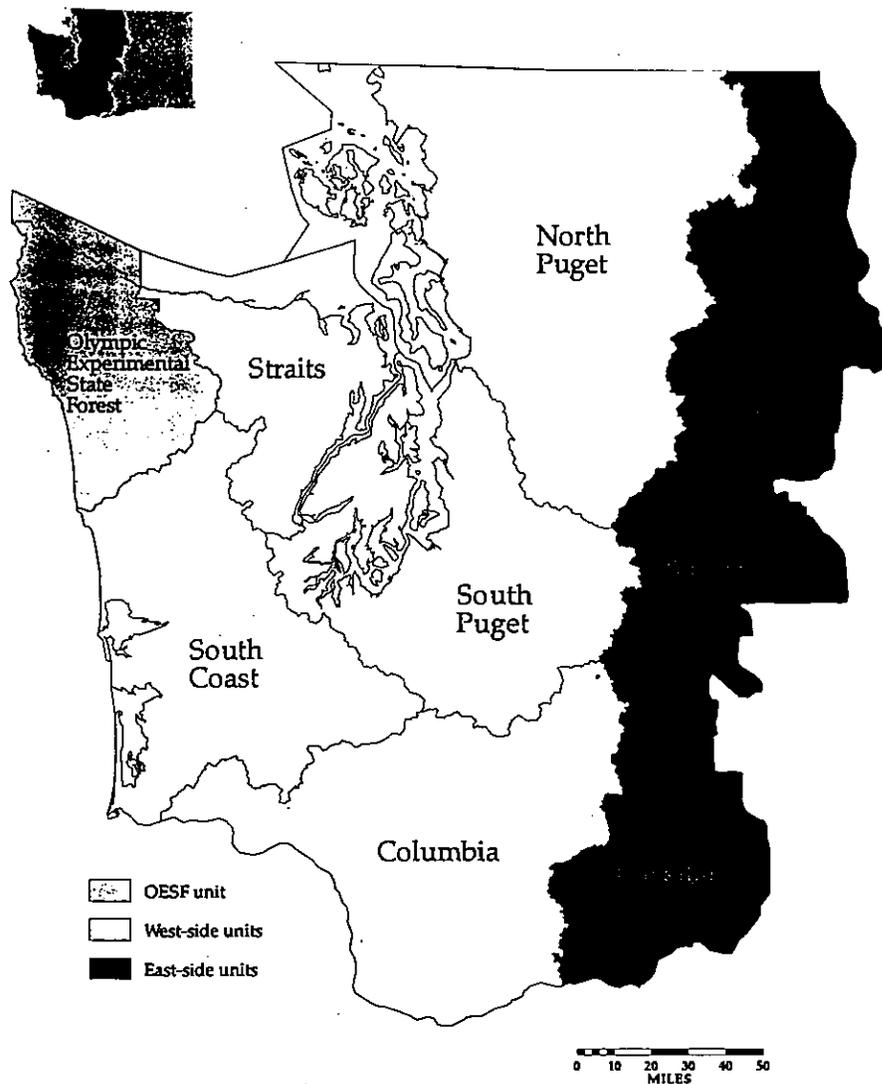


Figure 6. Relative Density Diagram (Hayes et al. 1997).

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**Map I.4: HCP planning units**

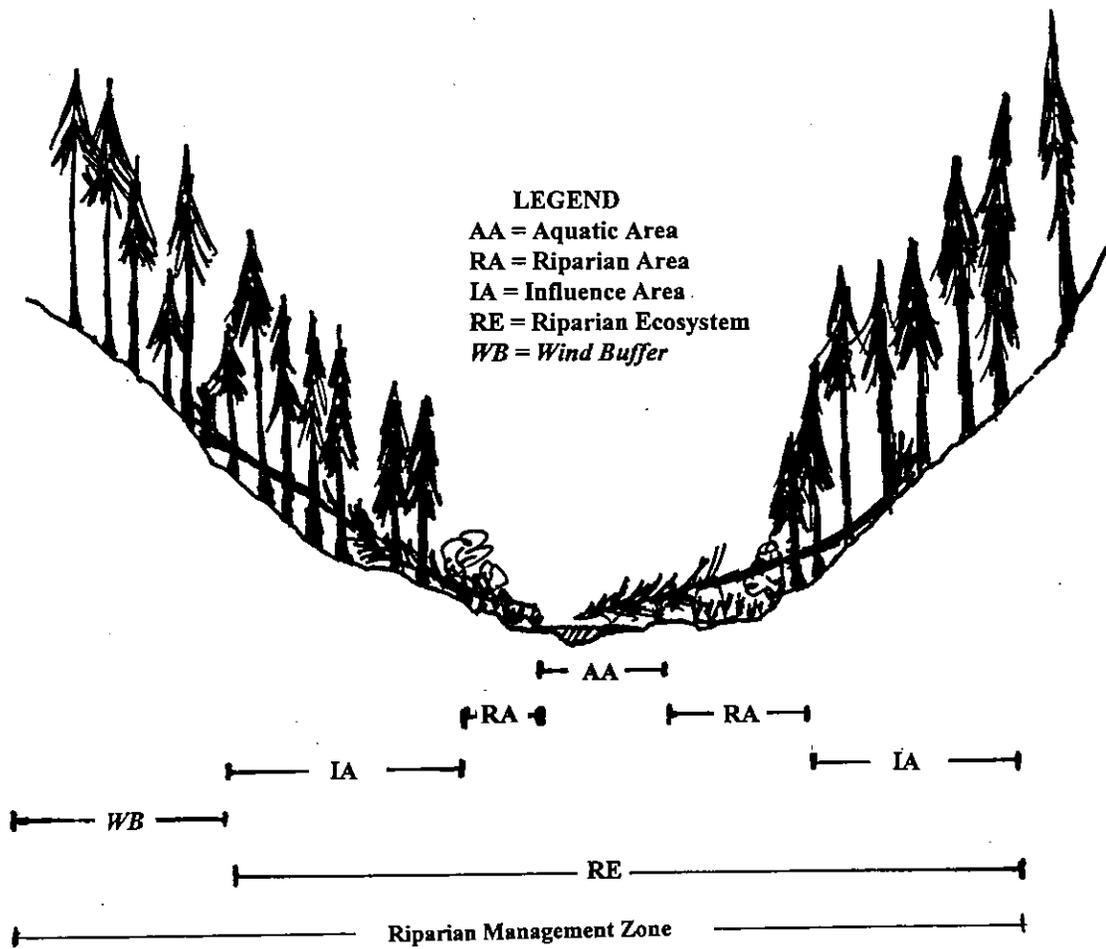
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RMS 8/97 (Source: DNR Geographic Information System, January 1997)  
This map is for planning purposes only.

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**Figure 1. Map of HCP Planning Units.**



**Figure 2. The Riparian Management Zone, The Riparian Ecosystem And It's Components, And The Wind Buffer.**

## Figure III.2: Relation between effectiveness of terrestrial elements of salmonid habitat and distance from stream channel

Root strength influences stream bank stability. Litter fall contributes organic nutrients to the aquatic food chain. Large woody debris performs many physical and biological functions essential to habitat quality. (See text.) (Modified from FEMAT 1993)

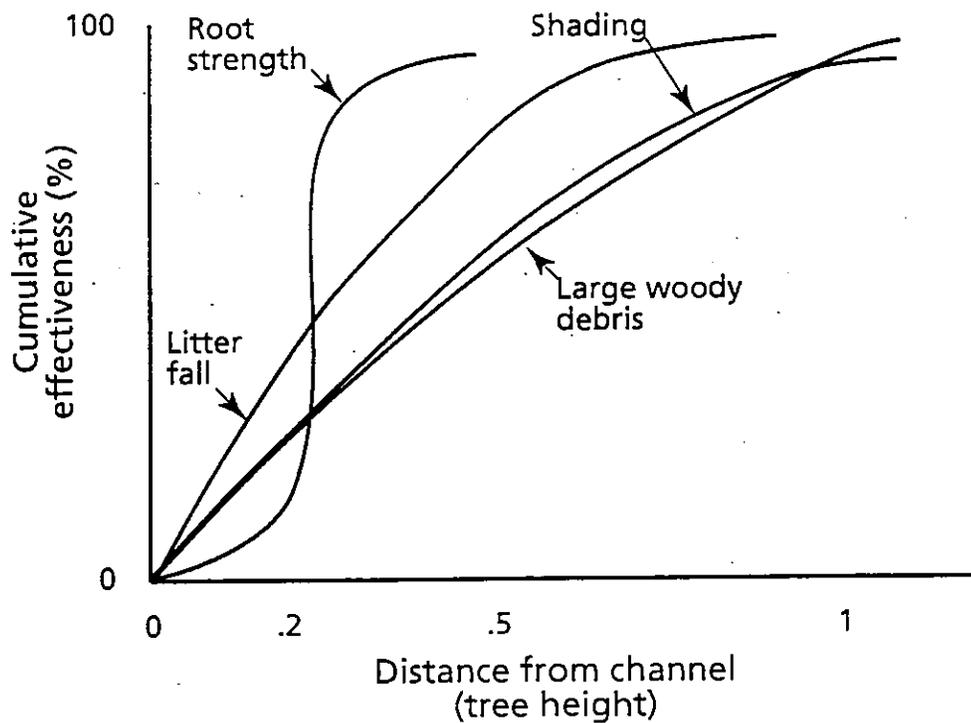


Figure 3. Relation Between Effectiveness Of Terrestrial Elements Of Salmonid Habitat And Distance From Stream Channel (FEMAT 1993).

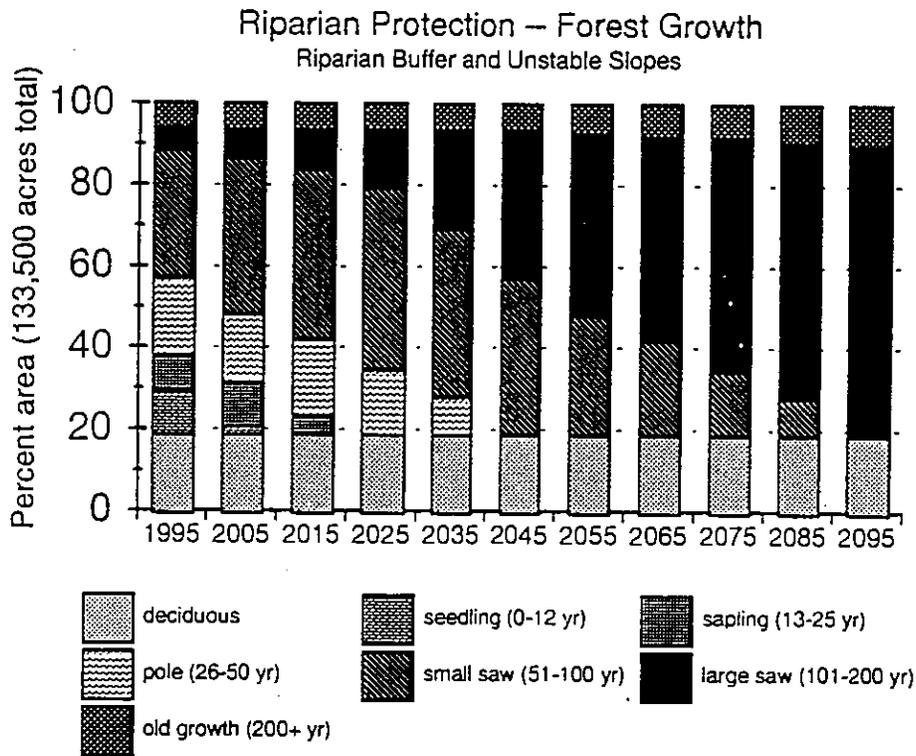
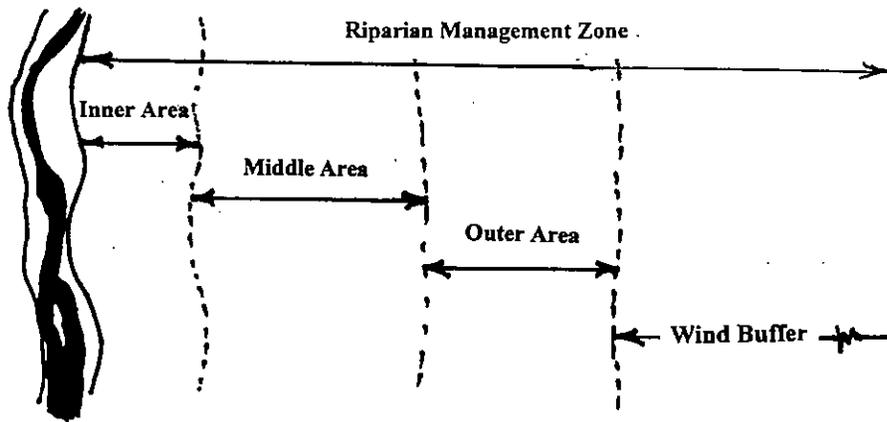


Figure 4. Riparian Protection And Projected Future Forest Growth On HCP Lands.

A.

Type 1, 2, and 3 Waters



B.

Type 4 Waters

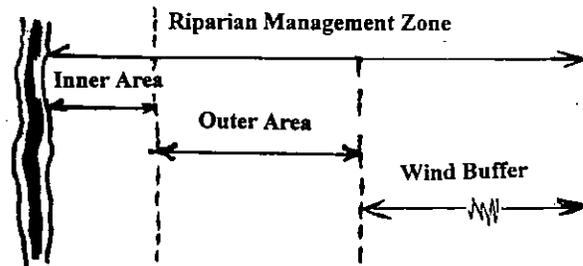


Figure 5. The Riparian Management Zone (including the inner, middle, and outer areas; and the wind buffer).

# Quinault Indian Nation

**Comments Received**



## Quinault Indian Nation

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December 19, 2013

Washington State  
Department of Natural Resources SEPA Center  
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RE: File No. 10-060101

To Whom It May Concern :

The Quinault Indian Nation (QIN) submits the following comments addressing the revised draft Environmental Impact Statement (RDEIS) for the Olympic Experimental State Forest (OESF) Land Plan Revised Draft EIS (RDEIS) Forest Land Plan issued in October 2013 by the Washington State Department of Natural Resources (DNR).

The QIN is a signatory to the Treaty of Olympia (1856) in which it reserved a right to take fish at "usual and accustomed fishing grounds and stations" and the privilege of gathering, among other rights, in exchange for ceding its lands it roamed freely. In a landmark case known as the "Boldt decision," a federal court confirmed that the treaty guaranteed Indian tribes a right to half of the harvestable fish in state waters and established the tribes as co-managers of the fisheries resource with the State of Washington. *U.S. v. Washington*, 384 F. Supp. 312 (W . D. Wash. 1974). Specific to the QIN, the Boldt decision affirmed the Quinault usual and accustomed fishing areas include the waters of the Queets River watershed including the Queets, Clearwater, Salmon, and Sams Rivers, Matheny Creek, and all other related tributaries of these waters, as well as adjacent marine areas. Id.at 374. The Queets River and related tributaries flows onto the Quinault Indian Reservation (QIR) at approximately river mile (RM) 6.5 and then continues to flow through the QIR to the Pacific Ocean. Any pollution that has the potential to impair or harm treaty fisheries in the Queets River and its related tributaries is of concern to the QIN and the DNR must ensure the OESF forest land plan must adequately address this concern. It is from this federally-protected interest that the QIN provides the comments below.

In a brief review of the RDEIS, we have identified several issues, which we provide below. We request that the DNR consult with the QIN on technical issues related to the revised document.

Comment 1: The RDEIS does not address operational practices that will affect the ecological impact of the forest management plan implementation. The cumulative ecological impacts of the RDEIS cannot fully be analyzed without addressing the operation practices and limitations.

*"This RDEIS is not meant to be a site-specific analysis of the potential environmental impacts of specific management activities such as individual timber sales or the construction of specific sections of roads" 3-11.*

Since the plan does not require "one-size-fits-all" prescriptions, it should define strict guidelines to mitigate negative environmental impact from harvest operations. Rather, it is left open for room to modify operational practices and these actual practices are not being accounted for in the environmental analysis. With the ability to vary riparian prescriptions on a site specific basis (without environmental review), constraints and limitations for management activities need to be clearly outlined to avoid natural resource damage. The QIN understands that the plan encompasses a phased review approach with site specific prescriptions to be identified later but, we question how environmental impacts of the plan are analyzed if procedures and occupational practices are ultimately not consistent within the plan. Also, unless the results of the site specific prescriptions are monitored, there is no way of determining if the practices are detrimental or beneficial to natural resources. It is not clear what monitoring has occurred and whether the results and impacts of the actual harvest are taken into account in the RDEIS analysis.

*"The riparian assessment area is patterned after the **expected average** width interior-core and exterior buffers as described in the 1997 Habitat Conservation Plan " Appendix D-11.*

The model uses the buffers described in the 1997 Habitat Conservation plan, but the actual buffers in the OESF may vary with experimentations and on the ground conditions. Using buffers from the HCP plan (not the OESF unit) is misleading since riparian zone buffer parameters are not clearly defined. Language such as "similar" and "generally" found in the RDEIS comparing the OESF buffer widths with the HCP plan is troubling. The OESF uses language that could allow harvest in important riparian zones and it is not being accounted for with the model analysis.

Therefore, the QIN recommends:

- Defining strict riparian management zone boundaries to achieve low impact harvests such as no cut zones
- No harvest within 150ft of streams typed 1-3.
- Adding more limitations on variable retention harvest and thinning within the riparian zone.
- No variable retention harvest within riparian zones on stream types 1-3.

Comment 2: The QIN is concerned that the RDEIS does not appear to evaluate what actually happens on the ground. The document seems to rely on an assumption that the current practices have been meeting the intent of the 1997 HCP without any supporting data or monitoring results. Has a performance audit or other monitoring been conducted of actual harvest units been completed since 1997? The level of flexibility within the plan and the lack of hard prescriptions raise the issue of

whether the actual activities match the assumptions from the original HCP.

Comment 3: The models used to evaluate the alternatives are based on surrogate data that do not necessarily reflect on the ground negative ecological impacts. The nation would like to see some analysis with current empirical data rather than theoretical, "surrogate" data for such a large forest plan.

*"In-stream data such as the amount and distribution of large woody debris, the presence and amount of leaf and needle litter in the stream, stream temperature, and sedimentation (settling and accumulation of sediment on the streambed) is not available in a comprehensive or readily usable form for all streams in the OESF. Therefore, DNR used surrogates to assess current and future conditions for each indicator. For example, as a surrogate for the number and size of logs in each stream reach, DNR assesses the characteristics of the riparian forest and its potential to provide large woody debris to the stream channel." 3-46*

The QIN recommend that riparian, fish habitat, and water quality models and analysis be based on real empirical data to ensure protection and recovery of treaty right protected organisms. For example, stream temperature is not added into the model, and therefore, the model does not accurately depict water quality results. For example, Pollock et al. (2009), and numerous other data are available and should be incorporated in the model (see comment 4 below). In addition, the condition of the channel must be evaluated as well. Since the HCP is intended to create and protect fish habitat, the effects from the plan on stream and river channels need to be evaluated within the RDEIS.

Comment 4: Where the DNR proposes to utilize surrogates as indicators for certain water quality conditions within the Queets drainages, the QIN proposes that a significant and usable dataset for stream temperature does exist in the Queets River watershed and should be used instead of surrogates. A brief, non-expansive search for water quality data in the Queets River watershed reveals the following water temperature data sets:

- USFWS/QIN Upper Queets River 1990 Spring Chinook Broodstock Studies (Wampler 1991).
- USFS 7DADM data from 1999, 2001, and 2002 (Sams River), and from 2002 (Matheny Creek) submitted to the Washington State Department of Ecology indicate portions of Matheny Creek and Sams River are not meeting state water quality standards (WQS) (see <http://www.ecy.wa.gov/programs/wq/303d/currentassessmt.html>)
- Twenty four of forty-nine streams monitored for water temperature were determined not to meet state WQS (Washington State Department of Natural Resources 2004).
- Seventeen of forty small streams either in or very close to the OESF failed State WQS (Pollock et al 2009).
- QIN instantaneous water quality parameter between about 1994 and 2013. Water temperature and other water quality parameters (e.g. dissolved oxygen, pH) were collected generally weekly from about 1994. Single samples were obtained using a Hydrolab or other standard methods under an

U.S. Environmental Protection Agency (EPA) approved Quality Assurance Project Plan (QAPP). Thermal Infrared Radiometry flights of 2011 summer water temperature for the Queets, Clearwater, lower Sams, Lower Salmon, and lower Matheny Creek (Watershed Sciences, Inc. 2011). These data were collected in a study conducted under an EPA approved QAPP. Available through EPA. Many miles of this data are on OESF lands.

- QIN Continuous water temperature monitoring for 2011 (90 sites), in 2012 (61 sites), and during 2013 (89 sites). This study data is based on an EPA approved QAPP using thermistors and methods consistent with the Washington Department of Ecology to record continuous water temperatures. Many of these sites are on OESF lands. This data conservatively shows that 49.4%, 68.9%, and 68.9% of sites monitored in 2011, 2012, and 2013, respectively, qualify for listing under Section 303(d) of the Clean Water Act (CWA) as impaired. A draft map of 2013 7DADM Queets River watershed water temperature results (Map 1) shows that the length of CWA impaired waters that exist in this area is in need of obvious revision in the RDEIS.

It is likely that logging activities have contributed to these impairments and related pollution to waters. Because the RDEIS relies on surrogates of water temperature when real data exist that shows widespread impairment, the QIN questions the DNR's conclusion in Table 5, p. ES-21 that the No Action and Landscape Alternatives have 'medium' impact to stream shade. The QIN does not agree that the RDEIS finding that either alternative will have no probable significant adverse environmental impacts on water quality.

The water temperature exceedances evident in available data suggest the proposed experimental riparian buffers and other practices are insufficient to protect ecological values that are critical to protecting fish habitat in the Queets River watershed. Data gathered from QIN monitoring efforts (Map 1) show wide-spread temperature impairments exist in the Queets and Clearwater River watersheds that qualify for Section 303d of the Clean Water Act (CWA) listing as impaired when Washington State Department of Ecology's (DOE) Water Quality Program Policy 1-11 are applied (Washington State DOE 2006b; Washington State DOE 2012 [revised]). These data are for 2013 and we have additional data that can be provided if needed. The analysis should address the presence of impaired water bodies within the management area. And this conclusion is reached without even contemplating the additional predicted increases in air temperature due to climate change in the next 50 to 100 years and related adverse hydrologic impacts.

Comment 5: Similarly, because widespread water temperatures qualify as impaired in the Queets River basin and OESF streams, the QIN questions the Fisheries findings Table 6 (pp. ES-23) for stream shade and likely other related water quality parameters. The QIN believes water temperature exceedances adversely affect multiple species of salmonids contrary to the draft fisheries determinations in Table 6.

Comment 6: Mitigation needs to be mandatory to mitigate past harvest operations. It is accepted that among the impacts of the previous harvest are reduced levels of LWD, an altered frequency of mass wasting (especially from roads), and an altered sediment regime. Some active mitigation projects related to LWD would support the fish habitat goals of the HCP.

Comment 7: On page 3-49 of the RDEIS, we believe DNR is addressing a prior QIN comment regarding its recommendation to set a desired future condition (DFC) for riparian tree growth (LWD recruitment) by indicating: *"A key principle of managing riparian ecosystems for habitat complexity is to focus on natural processes and variability. rather than attempting to maintain or engineer a desired set of conditions through time (Lugo and others 1999, Dale and others 2000 as cited in Bisson and Wondzell 2009). DNR is not working toward a set threshold for the number of watersheds in a low impact condition. Rather, DNR 's objective is to achieve a range of conditions that provide habitat variability and complexity."* QIN believes more discussion of its proposed concept for DFC's needs to occur because it believes that natural variability in stream attributes and natural disturbances will cause sufficient habitat variability under use of DFC's, unlike some engineered configuration constructed in totally controlled environment. QIN is also interested in better understanding how current on-the-ground determinations are made for sales versus under the Landscape approach.

Comment 8: Except for two brief responses to a general comment (Comment/Response in Appendix B, p. 12 and Appendix L, Comment Summary 90, p. L-30) the RDEIS information and analyses appears to be devoid of discussing the potential impacts caused by non-native, invasive species and needs at minimum to be added into ecological analyses and impact determinations. In general, the causes of the spread and transmission of invasive species need to be addressed in ecological terms, with binding solutions enacted, to prevent the spread and transmission of invasive species and also a means to detect and treat invasive species where they are known or suspected to exist. More specifically, the RDEIS fails to address the potential impacts of multiple species of knotweed to ecological values as well as forest production.

Urgenson et al. (2012) found that knotweed infestations kill Sitka Spruce, western Hemlock, and Red Alder seedlings. These tree species are common to the riparian zones, wetlands, and floodplains of the OESF. Widespread knotweed infestations may adversely impact a multitude of ecologically-based activities and resources, and QIN has been detecting and treating knotweed infestations in water resource inventory area 21 since 2008. Based on this work, the QIN has confirmed almost 31 river miles of knotweed exist in the Queets River watershed and are under treatment by the QIN (Map 2) with the most upstream infestation originating on DNR OESF forest lands near the Clearwater and Sollecks River confluence extending all the way down the Clearwater River to the Queets River then to the Pacific Ocean. Knotweed is easily spread to the OESF by heavy equipment as small pieces of plant lodge in the tracks and are spread as equipment moves from one site to another. Once present, knotweed is also spread easily downstream by flowing water, and thus spreads rapidly in a downstream direction once in a stream riparian area or floodplain.

If knotweed is left unchecked on the OESF over the 100 year plan timeframe, the QIN anticipates it will expand and take over riparian habitat, kill native tree seedlings, and over time start to convert riparian zone stands of trees that presently provide shade to streams and cool water temperatures. Consequently, the RDEIS fails to analyze the threat knotweed poses to the documented widespread impaired water temperatures observed in the Queets River watershed (and possibly elsewhere). Further, the RDEIS fails to examine other potential adverse ecological impacts from knotweed like competition with or conversion of native, culturally important plants, or overtaking important wildlife habitat along rivers needed by elk and other animals with expansive monocultures. The DNR

needs to incorporate information on knotweed in the RDEIS, examine the potential adverse impacts of knotweed to multiple ecological-based values, and to discuss what measures are in place (contractual, binding desired) to ensure that further spread of knotweed by OESF activities does not occur while simultaneously making provisions for detecting and treating areas that are either known or suspected to be impacted by knotweed.

Comment 9: The QIN understands that this RDEIS only considers two alternatives, each of which include a narrow range of objectives or outcomes to be assessed through an abstract modeling process. However, it is the impression of QIN that for the current practices, which are more conservative, WDNR has not had the capacity to conduct a thorough audit or post-monitoring assessment of these practices and their outcomes. Therefore, this RDEIS process should not be considered a final assessment of such issues.

Comment 10: Finally the QIN submitted four separate comments, including the one mentioned previously in respect to DFC's, and regarding an initial draft of the EIS in a letter dated July 15, 2010 (attached). The QIN is uncertain, especially given our joint staff meeting held on June 18, 2013, at Taholah to discuss DNR work on the RDEIS, whether these previous comments have been addressed in the October 2013 version. In June, 2013, the QIN understood that our 2010 comments would be addressed in the anticipated RDEIS and that the QIN would have another meeting with the DNR to review and discuss the forthcoming RDEIS (issued in October 2013) prior to issuance of a final EIS. *We recognize that WDNR has offered to reconvene to discuss the RDEIS and to provide additional time for QIN to comment on the RDEIS prior to DNR 's finalization of the EIS and request WDNR 's confirmation of that.*

Thank you for the opportunity to comment on the RDEIS. Please contact Dave Bingaman, Quinault Division of Natural Resources Director, at 360-276-8215 x374 to continue consultation on this proposal and to arrange a mutually agreeable meeting on the RDEIS.

Sincerely,

Fawn R. Sharp, President Quinault Indian Nation

Cc: Ken Berg, Manager, Washington Fish and Wildlife Office, USFWS  
Doug Zimmer, Tribal Liaison, Washington Fish and Wildlife Office, USFWS  
Dennis McClerran, Region 10 EPA Administrator  
William Stelle, Northwest Regional Administrator, NOAA Fisheries  
Steve Landino, State Director Washington State Habitat Office, NOAA Fisheries  
Maia Bellon, Director Washington State Department of Ecology

Attachments : References

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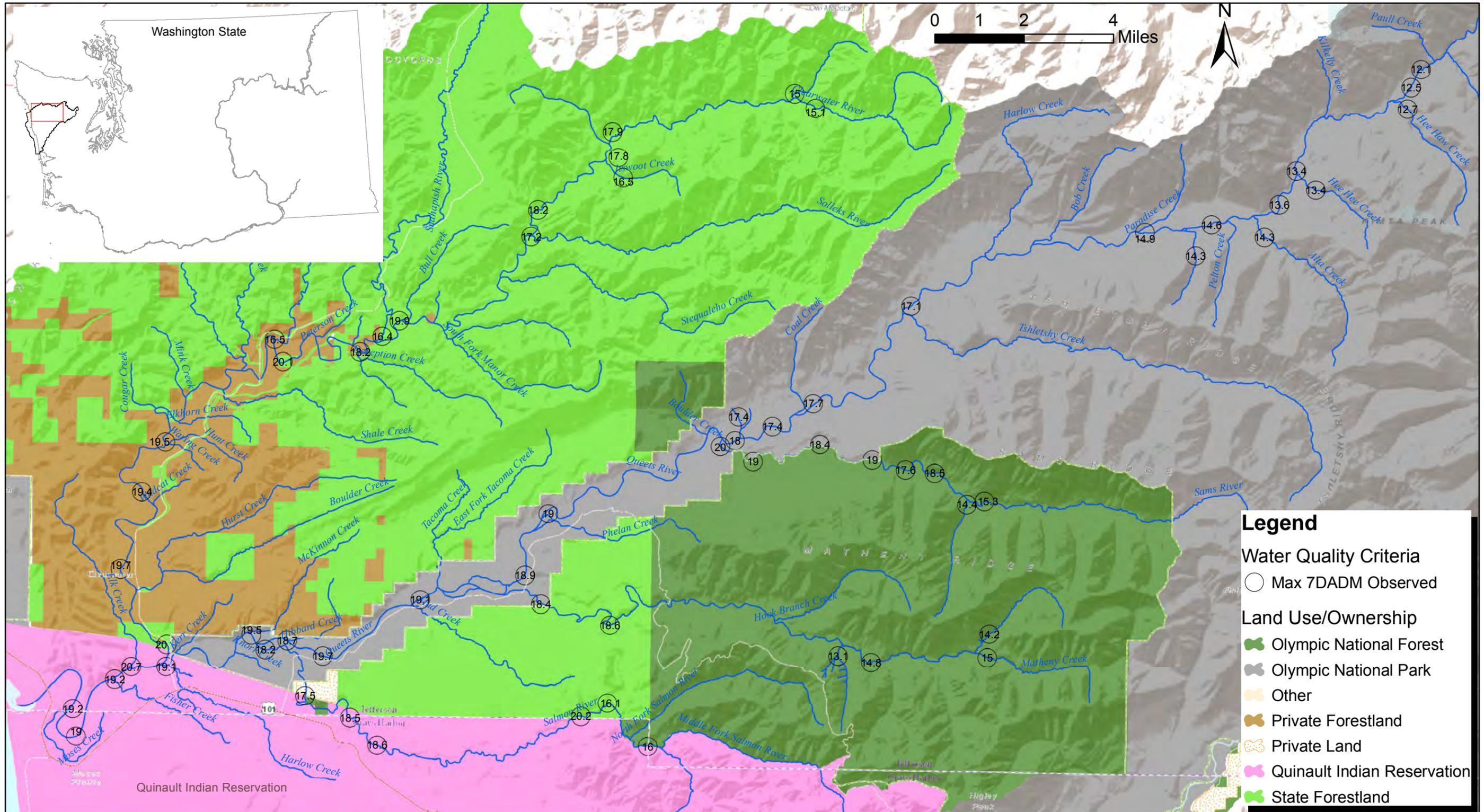
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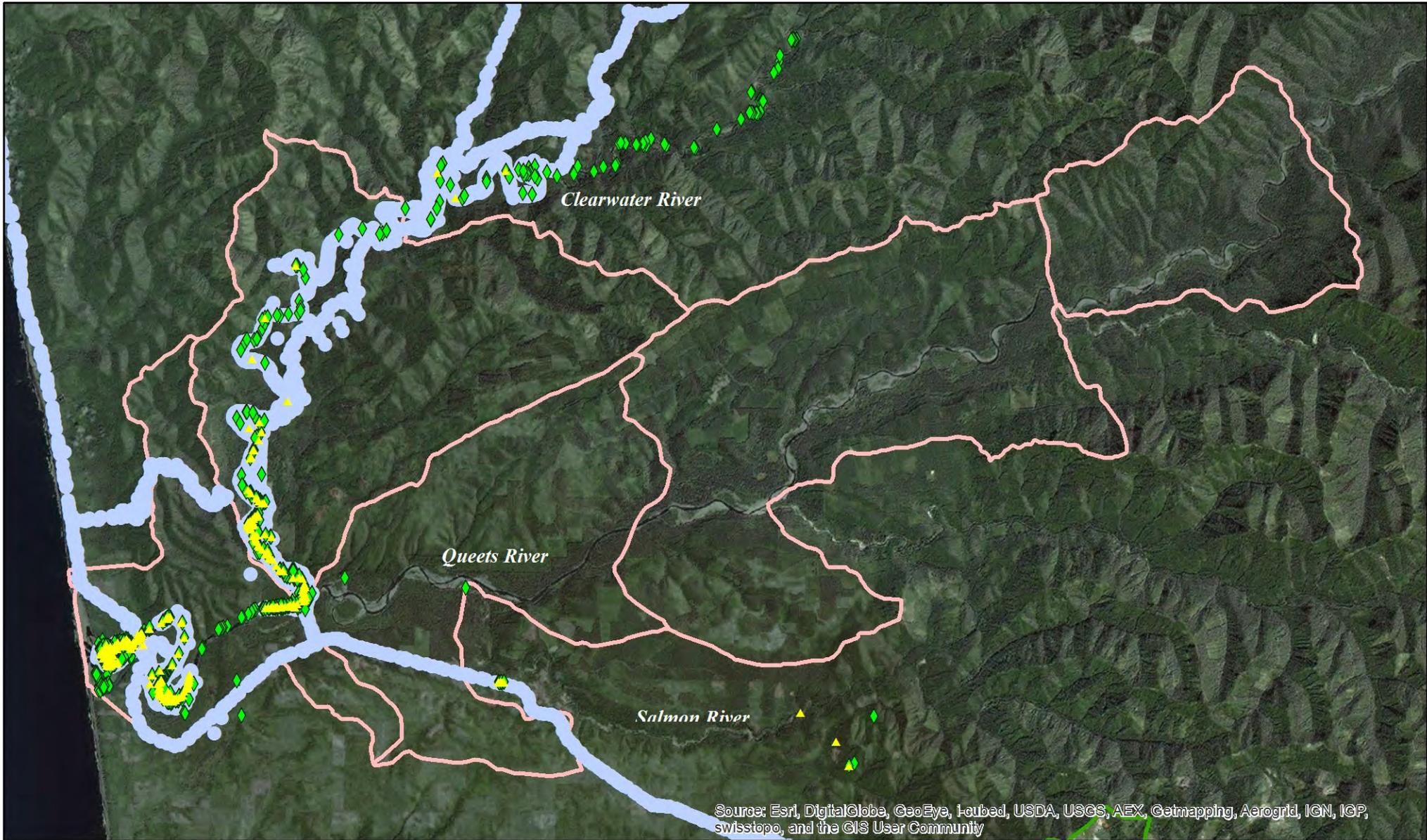
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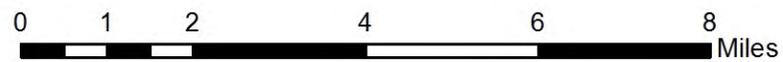
# 2013 Queets River Watershed 7DADM Data And Potential 303d List Of Impaired Water Bodies D R A F T



Eighty-nine (89) total project thermistors were installed in 2013. Eighty-seven (87) of the eighty-nine (89) thermistors logged sufficient data to compute station 7DADM value. Sixty (60) of the 87 units (68.9%) with 7DADM values were determined to fail either the 12° C or 16° C criteria by at least 0.4° C. Another 3 of the 87 thermistors were determined to have 7DADM values that were within the accuracy specifications of the thermistors (+/- 0.3° C).



**QIN - Competitive 319 Phase 2  
2013 Knotweed Infestations**



**Legend**

-  2013 KW Points
-  2012 KW Points
-  2013 Detection Area
-  Phasel1\_ProjectArea



## Quinault Indian Nation

POST OFFICE BOX 189 • TAHOLAH, WASHINGTON 98587 • TELEPHONE (360) 276-8211

July 15, 2010

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

RE: Comments on the Washington Dept. of Natural Resources DRAFT EIS for the OESF

Dear Loren:

The Quinault Indian Nation (Nation) offers these comments to provide technical and clarifying input to the Draft EIS. Besides our discussion of the impacts to resources of concern to the Nation, the Nation would like to offer its cooperation and potential collaboration in addressing issues regarding the Nation's timber harvest and regulatory responsibility on the Quinault Reservation Lands as well as adjacent state timberlands.

The Nation has reserved federally-guaranteed treaty fishing rights to take fish at its usual and accustomed fishing grounds, which includes Grays Harbor and its watershed, the Quinault River, the Queets and Clearwater Rivers and includes all other independent watersheds entering the ocean from Point Chehalis to the Destruction Island. *United States v. Washington*, 384 F. Supp. 312, 374 (W.D. Wash. 1974, aff'd, 520 F.2d 676 (9th Cir. 1975)). Additionally, the court in this case (commonly known as the Boldt decision) confirmed that Indian tribes and the state of Washington are co-managers of fisheries resources. Treaties are the highest law of the land and create a special fiduciary duty upon all agencies of the United States to protect treaty rights, including fishing rights. *Parravano v. Babbitt*, 70 F.3d 539, 546 (1995); *Seminole Nation v. United States*, 316 U.S. 286, 297 (1942). The Nation has defined legal rights and interests that will be affected by the proposed alteration of Management of State Trust Lands within the Olympic Experimental State Forest.

The Draft EIS raises some issues of concern to the Nation such as: 1) the added impact of multiple entries into the riparian zones of the rivers, streams and lakes of the OESF as those could affect attainment of future DFC targets and alter the timing and quality of LWD stream inputs and impact water quality in a manner that the site specific assessment can detect and

the landscape modeling could miss, 2) from Chapter Three, the description of the separation of the assessment of the indicator of riparian condition of Wind-throw from indicators such as; a) LWD recruitment potential, b) sediment control, or c) stream-bank stability as though they are not related in the time scales being assessed was interpreted on the one hand, in our read, but on the other hand may be addressed by the landscape modeling assumptions for wind-throw impact (Chapter Two, Table 2-2 and wind-throw potential Table 2-4), 3) the lack of assessment of differences of impact of the two options for unpredictable but likely events, including unusually intense storms, periodic high stream flows, large fires, global warming issues, inner gorge failures that penetrate into the managed type 3 areas, as well as the effects of the potential unauthorized removals of trees and downed wood in RMZ's based on access and enforcement issues, and 4) lack of designation of a DFC, at least of an interim nature.

Also, of interest to the Nation would be a discussion about any changes in the approaches to forest practice review that would occur for sales proposed for entry into RMZ's. Part of this interest would be a discussion of what actions are contemplated (maybe Adaptive Management) under each option in the event it was discovered through monitoring or prior to any of the expected entries into a riparian stand that a stand would fall short of future DFC targets under each option. Presumably, such an event has not been encountered yet.

- 1) For the proposed multiple entries into riparian areas under the OESF, WDNR indicates certain impacts cannot be assessed under this EIS because they cannot be modeled. The Nation believes, nonetheless those potential impacts must be assessed under this EIS. Otherwise, the Nation would recommend a special review process including the Nation and other affected tribes and regulatory agencies would need to be assigned upon each proposed entry to make individual assessments of individual project impacts.
- 2) The Nation would recommend that the assessment of riparian condition indicators, other than wind-throw, be done in conjunction with the wind-throw assessment and account for the different changes in the edge effects that result from multiple entries and multiple wind-throw events if that has not been done. For the Chapter Two (Table 2-2 and 2-4) references to wind-throw we would appreciate clarification. How does this section reconcile with the section regarding assessment of riparian indicators in Chapter Three? We would expect if wind-throw has a measured effect, then LWD potential would be affected as a result of impacts to the makeup of the riparian overstory vegetation, effects on species composition, sizes, density and distances from the stream channel as well as distances from access road openings. Please explain the affect of the assumption in Chapter Two, Table 2-4 that constraining large woody debris recruitment potential addresses wind-throw potential and how use of the model identified in Table 2-2 for the No action alternative comparatively affects long-term modeling.

The Nation generally agrees with the statements about Wind-throw on page 13 (Chapter Three-Riparian). However, we do not consider LWD long-term recruitment to be

necessarily benefited by all such wind-throw events. The timing and quality of LWD inputs provided by wind-throw in more open canopy will be altered under the entry alternative. At the same time we would consider LWD recruitment potential to usually be negatively impacted because of the patch-like effect of wind-throw. Statements need to be considered for each indicator that also includes consideration of the affect of wind-throw on that indicator, especially a), b) and c). Therefore, concern about wind-throw should not be limited to regeneration harvest alone.

- 3) The Nation recommends that this EIS offer an assessment of the effect of other issues that are not predictable, but likely, including the abnormal high stream flow, fire, inner gorge failures, or global warming events on riparian conditions and their indicators and unauthorized removal of trees or downed wood. Adaptive management and mitigation measures should be discussed for these as well as to address other unexpected outcomes.
- 4) The Nation recommends that an interim DFC be defined for RMZ's. Such an approach would be consistent with the state's commitment to Adaptive Management, recognizing those parameter values may change as more information becomes available.

Thank you for your consideration of these comments. If you have any questions, please address them to Dave Bingaman, Director of the Nation's Division of Natural Resources, at 360/276- 8211 ext. 374 or [dbingaman@quinault.org](mailto:dbingaman@quinault.org).

Sincerely,

Fawn R. Sharp, President Quinault Indian Nation

cc:

WDNR email: [sepacenter@dnr.wa.gov](mailto:sepacenter@dnr.wa.gov) David Bingaman, QDNR  
Mark Mobbs, QDNR

# Seattle Audobon Society

**Comments Received**

December 16, 2013

DNR SEPA Center  
P.O. Box 47015  
Olympia, Washington 98504-7015

Re: File No. 10-060101. Revised Draft Environmental Impact Statement on the Olympic Experimental State Forest (OESF) HCP Planning Unit Forest Land Plan

Dear Civil Servants,

Thank you for the opportunity to comment on the Olympic Experimental State Forest (OESF) Revised Draft Environmental Impact Statement (RDEIS). Seattle Audubon Society's mission is to cultivate and lead a community that values and protects birds and the natural environment, and serves over 5,500 members. Seattle Audubon Society works closely with likeminded organizations, including the Sierra Club, Olympic Forest Coalition and Conservation Northwest, on conservation advocacy.

In Washington State, the most recent estimate of the annual rate of population decline derived from observed at-sea Marbled Murrelets is 7.5% per year from 2001-2012.<sup>1</sup> This monitoring effort has also showed a decline in at-sea density (number of birds per km<sup>2</sup>) of murrelets of 4.07% per year. This decline is a result of historic and ongoing loss of quality nesting sites and habitat fragmentation. The impact of habitat loss and fragmentation on murrelet populations was detailed five years ago in the 2008 "Science Report" that was **commissioned by DNR** and drafted by Marbled Murrelet experts with the explicit intention of forming the basis for a long-term conservation strategy to meet the obligations of the 1997 State Trust Lands HCP.<sup>2</sup>

**DNR's 3/7/2013 OESF Marbled Murrelet Management Memo is inconsistent Science Team Report guidance.** In the OESF RDEIS, DNR is using guidance from a 3/7/2013 internal memo titled "Memorandum for Marbled Murrelet Management Within the Olympic Experimental State Forest." This OESF Memo is inconsistent with the Science Report because it treats all OESF Landscape Planning Units exactly the same despite their wide variability (for Marbled Murrelet habitat and contributions to conservation), makes occupied site buffers optional, and provide no restoration for Marbled Murrelet Management Areas (MMAs). DNR should instead rely on the 2008 Science Team Report for management guidance.

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<sup>1</sup> Lance, M. M., S. F. Pearson, M. G. Raphael, and T. D. Bloxton, Jr. 2013. Washington 2012 at-sea marbled murrelet population monitoring: Research Progress Report. Washington Department of Fish and Wildlife, Wildlife Science Division and USDA Forest Service Pacific Northwest Research Station, Olympia, WA.

<sup>2</sup> Raphael, M. G., S. K. Nelson, P. Swedeen, M. Ostwald, K. Flotlin, S. Desimone, S. Horton, P. Harrison, D. Prenzlou Escene, and W. Jaross. 2008. Recommendations and Supporting Analysis of Conservation Opportunities for the Marbled Murrelet Long-Term Conservation Strategy. Washington State Department of Natural Resources, Olympia, WA

**The OESF HCP Planning Unit Forest Land Plan (OESF Plan) forecloses conservation options.** In a 6/7/2011 letter from United States Fish and Wildlife Service's (USFWS) Ken Berg to DNR's Commissioner Peter Goldmark, Mr. Berg states the following: "While we do not consider that the MMAs proposed in the Report are the only possible approach for an acceptable long-term strategy, it is very important that DNR not preclude this conservation option while the long-term strategy is completed. Similarly, DNR should not foreclose the option of achieving long-term murrelet conservation in the OESF by applying the [Science Team] Report's recommendations for the LPUs." DNR has yet to complete the Long Term Conservation Strategy for Marbled Murrelets. Accordingly, the OESF Plan should not foreclose conservation options and is premature until DNR has completed its long-term conservation strategy for Marbled Murrelets (LTCS).

**Seattle Audubon is also concerned about Northern Spotted Owls (NSO) in the OESF.** As currently proposed, the OESF Plan aims to log between 3,300 and 16,000 acres of owl nest sites **each decade** and doesn't utilize updated science on NSO. Seattle Audubon endorses the OESF RDEIS comment letter focused on Northern Spotted Owls from Dave Werntz, Conservation and Science Director at Conservation Northwest.

In conclusion, Seattle Audubon urges DNR to delay the OESF Plan until the LTCS for Marbled Murrelets is completed. At minimum, Seattle Audubon urges DNR use the 2008 Science Report and the updated science on NSO as the basis for the preferred alternative for landscape management in the OESF. Thank you for the opportunity to comment on this RDEIS.

Sincerely,

Brian Windrope Executive Director Seattle Audubon Society

Chris Karrenberg, Conservation Committee Chair Seattle Audubon Society

**Sierra Club**

**Comments Received**



Explore, enjoy and protect the planet

December 16, 2013

DNR SEPA Center  
P.O. Box 47015  
Olympia, Washington 98504-7015

Re: OESF Forest Land Plan Revised Draft Environmental Impact Statement (RDEIS)

**Thank you for the opportunity to comment on the OESF RDEIS. The Sierra Club's** mission is to explore, enjoy, and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; to educate and enlist humanity to protect and restore the quality of the natural and human environment; and to use all lawful means to carry out these objectives. Founded in 1892, the Sierra Club is one of the oldest, largest national conservation organizations in the country, with over 26,000 members and supporters in Washington State. The Sierra Club has been working closely with likeminded organizations, including the Seattle Audubon Society, Olympic Forest Coalition and Conservation Northwest. (insert something about those comments here)

The Olympic Peninsula represents one of the best places to replenish diminished salmonid populations, restore threatened marbled murrelet numbers and build on conservation for the northern spotted owl. The peninsula hosts some of the last and best old forest in Washington State, and supports important recreation and fishing industries that provide jobs, attract skilled workers, and bolster local economies. In addition, lands around the Olympic National Forest and the Olympic National Park represent important buffers to essential landscapes that sustain wildlife, attract visitors, and support cultural and traditional needs. On a planet where all is connected, the forest practices on the Olympic Experimental State Forest have far reaching impacts.

Forest and watershed health on the Olympic Peninsula is a key concern for the Sierra Club. As we experience and prepare for additional climate disruption, the Sierra Club recommends even greater emphasis on protecting headwaters, safeguarding and supporting **"core" unroaded forest lands and providing strong buffers that sometimes** serve as corridors, connecting core areas. Buffers to protect core habitat and water systems are crucial at every scale. The Sierra Club is specifically concerned that the

Landscape Plan and its RDEIS reduce the buffer widths and increase the timber harvest in those buffers over buffers set in the 1997 Habitat Conservation Plan. Rather than increasing harvest and decreasing buffer width in fragile and functionally-important buffer zones, these zones should be expanded and timber harvesters should consider the increasing frequency of flooding and other flow changes and avoid harvest that would harm fish populations and destabilize stream conditions.

As we work to support salmon recovery, stream buffers and forest practices around streams will have significant impacts for salmon recovery. In addition, climate disruption has placed increased pressure on threatened species and will require the agency to utilize the precautionary principle when making decisions that could strain species recovery.

The OESF hosts important habitat for the threatened marbled murrelet as indicated in the DNR-commissioned 2008 Science Report. Scientists recommended **Marbled Murrelet Management Area's inside the OESF that represent key blocks of nesting** habitat vital to the survival of the species in our state. The most recent estimate of the annual rate of decline in the marbled murrelet density is 4.07% per year (from 2001-2012, Lance et al, 2013). Historic loss and fragmentation of nesting habitat are some of the primary factors responsible for this decline. From 1996-2006 roughly 243,500 acres or 30% of higher suitability nesting habitat was lost on nonfederal lands in Washington State, including in the OESF, and 94% of this loss was due to timber harvest (Raphael et al. 2011). The fragmentation and activity in marbled murrelet habitat has increased rates of nest predation by crows, ravens and jays and significantly contributes to the decline of the species.

In order to contribute to the recovery the marbled murrelet, DNR should heed the recommendations of the 2008 Science Report, which makes clear that the at a minimum, DNR should;

- Require timing restrictions from adjacent management activities in a 0.25 mile radius around all occupied sites during the breeding season of April 1<sup>st</sup> to September 15<sup>th</sup>
- Require 328 foot (100 meter) buffers around all occupied sites and old forest
- Designate the marbled murrelet management areas as defined by the Science Team and begin to restore habitat within them
- Provide opportunities adjacent to marbled murrelet management areas to mitigate for harvest in those core areas since the completion of the science report

The Sierra Club recommends DNR acknowledge the impacts past forest practices have had on the decline of the marbled murrelet and take the 2008 Science Report recommendations seriously as DNR works toward balancing fiduciary duties and responsibilities the habitat conservation plan requires. The Sierra Club recognizes **DNR's challenge in managing sometimes competing interests and responsibilities and urges DNR to take very seriously its actions which result in "take" of federally listed species or preclude future opportunities to contribute to the real recovery of these species. DNR's vision is to leave a legacy of healthy forests**, clean water, and thriving ecosystems while maintaining a vibrant natural resource-based economy. We ask DNR to be true to this vision, which must make room for both people and wildlife as we try to maintain and restore thriving ecosystems for generations to come.

Monica Fletcher  
Chair, North Olympic Group  
Sierra Club, Washington Chapter  
P.O. Box 1083  
Port Townsend, WA, 98368

### **Cited Materials**

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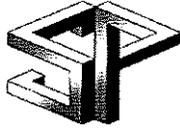
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Washington State Department of Natural Resources Mission and Vision Statement,  
<<http://www.dnr.wa.gov/AboutDNR/Mission/Pages/Home.aspx>>.

# Sierra Pacific

## Comments Received



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SIERRA PACIFIC INDUSTRIES  
*Growing Forests for our Future*

December 16, 2013  
WDNR SEPA Center  
Post Office Box 47015  
Olympia, WA 98504-47015  
also by email to [sepacenter@dnr.wa.gov](mailto:sepacenter@dnr.wa.gov)

To whom it may concern:

Thank you for the opportunity to provide comment on the Revised Draft EIS for the Forest Land Plan for the Olympic Experimental State Forest (OESF). We are a lumber manufacturer with three sawmills in the state of Washington. Timber sales from the OESF are a considerable source of raw materials for our operations. Many of our employees, as well as those of our supply chain business partners, live in the communities which are beneficiaries of the OESF trusts.

We support the ongoing efforts of the Washington Department of Natural Resources to complete and ultimately implement the OESF Forest Land Plan. The OESF, as a distinct planning unit under the State Habitat Conservation Plan, represents an important opportunity to integrate commodity production and conservation. We support the Policy for Sustainable Forests which requires management in older forests to achieve the OESF goals. The following are areas of concern with the RDEIS and associated Draft Forest Land Plan (Appendix A) as well as suggested improvements.

- 1) It is **unclear how and whether the trust mandate is fulfilled under the Draft Plan.** Over 107,000 acres (40 % of the land base) are in long-term deferrals, with no harvest for the term of the Plan. Stated reasons for deferral are varied, including both regulatory and policy matters as well as the interim constraints of the 2006 Settlement Agreement. This results in an assumed sustainable harvest level much lower than the biological capacity of the OESF. Comparable private properties managed for long term growth of forest products typically achieve conservation of non-timber resources and compliance with State and federal regulatory requirements with 15 to 25 % of the landscape in long term deferral. The reason for why management of these acres is deferred should be explicitly itemized in the FEIS. With this information WDNR should analyze and present the financial results of an alternative which maximizes return from harvest

constrained only by current regulatory requirements. Only then can the public and the trust beneficiaries determine if the preferred alternative adequately achieves the goals of the OESF.

- 2) **Artificial modeling assumptions lead to productive acres analyzed as unmanaged.** Of the 146,734 acres identified as "operable", the modeling effort suggests that 26,289 acres will receive no management treatments over the next 100 years. It is not clear how a "no management" prescription will either support commodity production or foster habitat development. The RDEIS suggests that these are areas in addition to long term deferrals. The reasons or modeling constraints should be clearly identified and any unintended modeling constraints should be corrected in the FEIS. The Plan should explicitly indicate that the no-management acres are not a hard target, but rather a best estimate given current model assumptions and are subject to decrease in the future.
- 3) **Modeling assumptions lead to extended rotations and may overestimate revenues.** Projected rotation lengths vary from 40 to 80 years, with 23,365 acres (nearly 20 % of the identified operable acres) projected for "thinning only". The weighted average rotation length exceeds 60 years (data Table A-17). The proportion of large diameter logs increases proportionate to increased rotation age. The RDEIS relies on average stumpage values and average harvest costs only. However, trends in domestic log demand discount very large diameter logs.

Modern mills in the OESF operating area are optimized for logs typical of rotation ages less than 50 years. The RDEIS financial analysis obscures these factors and erroneously assumes equal revenue per unit volume regardless of rotation age. The FEIS should analyze this effect and the Plan should match market signals.

- 4) **"No management" assumed to be the best path to meeting the 20/40 NSO habitat goals.** It is not clear if thinning or other harvest treatments to accelerate development of Young Forest Marginal and Old Forest habitat were analyzed. The RDEIS suggests that "no management" was assumed to most quickly reach those goals. We believe it is consistent with the OESF goals to utilize *active* management to further conservation objectives.
- 5) **Deferral lands have no scheduled harvests.** The Policy for Sustainable Forests stipulates that "...the department may conduct operations in old-growth stands consistent with the requirements of DNR's *Habitat Conservation Plan* to meet the research objects of the (OESF)." Instead, the RDEIS and Draft Plan are lacking in identifying any harvest for research purposes in old-growth, instead deferring harvest for the 100 year duration of the Plan. We believe this is inconsistent with

the HCP, the Policy for Sustainable Forests, and the trust mandate and an action plan should be included for analysis in the FEIS.

Thank you again for this opportunity to provide comment. We look forward to seeing these issues addressed in the FEIS.

Sincerely,

John D. Gold,  
Hamilton District Forester

# Wild Salmon Center

## Comments Received

December 16, 2013  
Washington Department of Natural Resources  
SEPA Center  
1111 Washington Street Southeast  
PO Box 47015  
Olympia, WA 98504-7015

RE: identifying Essential Fish Habitat in WA DNR RDEIS for OESF

Dear SEPA Center,

We are writing to provide comments on Washington State Department of Natural Resources' (DNR) Revised Draft Environmental Impact Statement (RDEIS) for the Olympic Experimental State Forest (OESF) Habitat Conservation Planning Unit (HCP). Specifically, we would like to comment on the use of Intrinsic Potential modeling to identify essential fish habitat (Chapter 2 and Appendix P) in the OESF.

Wild Salmon Center (WSC) is an international non-profit organization whose mission is to identify, understand, and protect the most important wild salmon ecosystems of the Pacific Rim. Over the last five years, we have been working with the Washington Coast Sustainable Salmon Partnership (WCSSP), fisheries co-managers, and local experts to develop Intrinsic Potential models.

In 2012, WSC contracted the University of Washington's Olympic Natural Resources Center (ONRC) to create Intrinsic Potential (IP) models specific to the Washington coast. The IP models used by DNR in the RDEIS for the OESF to define essential fish habitat were Phase II models created by ONRC.

We commend DNR for its interest in cutting-edge, locally-reviewed science to help identify essential habitat for wild salmon and steelhead at a landscape scale in the OESF. However, as sponsor, principle investigator, and collaborators exploring the application of IP models to Washington's coastal rivers, we need to make it clear that we do not believe that these models are sufficiently refined to produce meaningful and useful results. As stated in ONRC's Final Report (February 2013) to WSC after a 2-day peer review workshop,

*"While its simplicity is considered a fundamental strength of the model, its simplicity may also lead to misinterpretation. Sponsors were asked to be careful of wide distribution of maps or misrepresentation of their value.*

*Participants clearly agreed that in its current state the default IP Model produced results that were of questionable value. The output maps failed to provide immediately meaningful direction regarding the most valuable habitat in most rivers system. Workshop attendees were most unsatisfied with regard to the model's power to place requisite value on rearing habitat. All agreed that an effort should be made to tailor the model to differentiate spawning and rearing*

*habitat suitability.”*

The Final Report also noted a list of specific technical caveats as follows:

- *The modeled life cycle habit of a given species may not extend across the entire fish bearing network. In particular, Chinook spawning is limited to an 8% gradient or less so it should be no surprise that there will be a lot of zero IP reaches representing habitat unsuitable for spawning, yet entirely suitable in the rearing phase. This becomes apparent in both the maps and the charts presented below. It has been noted that Coho utilize almost their entire fish bearing network at one point or another in their lives.*
- *Barriers may present blockages to specific species seasonally, such as low flows in riffles. Various runs may not be able to surmount waterfalls, while others can, as flow is seasonal. Thus, in presenting these maps with participant’s spatially explicit commentary, it is assumed, for example, that the barriers presented by a Coho expert will not apply to Chinook, unless a Chinook expert has also cited it.*
- *The binning schema used for each species may be subject to change, and the schemes depicted on the IP maps should be considered when evaluating them. Contribution by participants at the IP Review Workshop were few and far between in the HS Values group while those made by the Map Review Group were more extensive (particularly for Chinook) but still somewhat spotty. Because of this, and time constraints, their contributions are presented above in the Summary section but are not reflected in the maps.*
- *Spawning areas cannot be correlated easily to rearing models, and presence areas cannot be easily correlated to spawning models. Spawning areas may contradict a rearing model if the habitat is deemed unsuitable (zero) by the model, or, if a rearing model designates a spawning area as unsuitable (zero). Low IP scores may invite queries.*

As these comments suggest, we believe that the IP models applied to coastal rivers are still in draft form and require substantial work before they should be relied upon to provide meaningful guidance. In addition, our peer review session convinced us that the current IP model output should not substitute for on-the-ground fish data when that information is available.

We do appreciate your interest in new tools to identify essential fish habitat for various species at a landscape scale. We stand ready to collaborate with DNR staff over the next three years as we work to improve Washington coast IP models for application.

*Sincerely,*

Miranda Wecker, Director of Marine Programs  
Olympic Natural Resources Center, University of Washington

Guido Raht, President and CEO  
Wild Salmon Center

Mel Moon, Director of Natural Resources  
Quileute Nation

Dave Bingamen, Director of Natural Resources  
Quinault Indian Nation

# Washington Department of Fish and Wildlife (WDFW)

Comments Received



State of Washington  
DEPARTMENT OF FISH AND WILDLIFE

Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207  
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

December 16, 2013

Washington Department of Natural Resources  
SEPA Center  
PO Box 47015  
Olympia, WA 98504-7015

Dear Responsible SEPA Official:

**SUBJECT: File No. 10-060101, Revised Draft Environmental Impact Statement,  
Olympic Experimental State Forest (OESF), Forest Land Plan, October 2013**

The Washington Department of Fish and Wildlife (WDFW) has reviewed the Olympic Experimental State Forest (OESF) Forest Land Plan Revised Draft Environmental Impact Statement (RDEIS). We would like to thank the Washington State Department of Natural Resources (DNR) for providing this opportunity to comment on the RDEIS for the OESF. We would like to commend DNR for your extensive review of comments received for the initial Draft Environmental Impact Statement (DEIS) presented in 2010, along with the extensive additional analysis. We found this document to be written in a concise manner that is easy to understand while also providing an abundance of in-depth background information as appendices.

Based on our review, we offer the following comments:

**PROPOSAL**

DNR proposes to adopt a forest land plan for the OESF that will provide a set of forest management strategies designed to meet DNR's purpose and need, along with management objectives for the OESF HCP Planning Unit. These strategies will be incorporated into the OESF Forest Land Plan, and are intended to direct on-the-ground forest management activities to achieve implementation of the agency's policies including the sustainable harvest level for the planning unit.

**REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (RDEIS) ALTERNATIVES**

DNR is proposing two alternatives for the proposed forest land plan action, the **No Action Alternative** (no change to current management practices) and the **Landscape Alternative** (change to landscape planning perspective for management practices). As presented, DNR is proposing to implement the Landscape Alternative, as it more effectively meets DNR's policies

and objectives for forest management, their conservation strategies, and also their fiduciary responsibilities to trust beneficiaries. Overall, WDFW supports implementation of the Landscape Alternative. This alternative provides a more comprehensive evaluation of timber harvest effects on forest ecosystem functions (aquatic and terrestrial) for multiple species than the current DNR alternative of evaluating timber harvests one-at-a-time, on a local watershed scale. Landscape-level planning and management provides greater species and habitat conservation opportunities and a broader spectrum of forest management options than a site-by-site approach.

## **FOREST ESTATE MODEL (FEM)**

General comments concerning the FEM include the following:

### Appendix A-6: Mapping Northern Spotted Owl Habitat in the OESF: Two Approaches

WDFW calculated some significant differences in predicted Spotted Owl habitat from the Tables in Appendix A-6 between the Current model planning layer and the Proposed FEM model-predicted habitat acres. Depending on landscape unit, the Proposed FEM model predicts more (e.g., Clallam: 2.4x; Clearwater: 1.5x; Reade Hill: 1.3x; Sekiu: 3.6x) Young-sub mature Forest than the Current model layer. Overall, 10 of 11 OESF sub-landscapes convey an increase in predicted habitat using the Proposed model as compared to the Current model for both Old Forest and Young-sub mature Forest. Given the uncertainties of the disparity we have noted between predicted acreages, it appears that the Current model layer may under-estimate habitat or the Proposed model over-estimates habitat (e.g., Map A6-1, Clallam Landscape). It seems most likely that the results are a combination of both occurring, which leads to less confidence in the predicted habitat outcomes.

Another complication that could be occurring is that the FRIS polygon delineations used to delineate the owl habitat polygons may have multiple age classes within some polygons, and thus, may not always align with the forest inventory data plots. WDFW's assessment of marbled murrelet survey polygons (composed of  $\geq 1$  FRIS polygons) in the Straits Planning Unit demonstrated this to be a source of error when the habitat model was applied to the landscape (i.e., platforms not present; younger age classes next to older age classes within a polygon). We believe this to be a significant factor in misclassifying marbled murrelet habitat within that landscape (Desimone et al. 2013). While the inventory plot data may be considered by DNR to be adequate for the most part, it is the combination of the above concerns that lead us to propose that DNR conduct some research and monitoring to help reduce model uncertainty and improve habitat predictability. This would allow DNR to take steps on the ground to rectify model prediction inaccuracies for both false positives and false negatives.

If the polygon misclassification problem is inherent and carried forward, it may continue to make future modeled habitat predictions problematic. WDFW recommends a simple model field validation, by taking a random sample of FRIS polygons predicted by Proposed FEM as Young-sub mature Forest to assess whether they meet the Spotted Owl habitat definitions. This will help to determine the degree of risk for incorrect habitat classifications. DNR could then use this data to better inform the model and to refine the habitat estimates.

#### Appendix D: Modeling

WDFW has a concern that using the model inventory method (Washington Forest Practices Board (FPB) Manual Section 15) to inform the Forest Estate Model could be a problem because the data used for that model development was gathered exclusively in SW Washington on private industrial forest and may not be appropriate for modeling growing conditions in the OESF. Although used in the FPB manual, there has not been further model refinement or validation to substantiate its effective utility outside of SW Washington. The polygon ground-verification study recommended above in our previous comment could also help refine this part of the model and reduce uncertainty in predicting future forest structure. The Stand Structure Complexity Index is an untested assumption, and should require some monitoring by DNR.

#### Habitat thresholds

Table A-21, Page 83: Related to the future habitat acres predicted by the Proposed model as described above, we have a concern as to whether all of the Landscape units can meet the 40% Young-sub mature Forest/Old Forest thresholds by the end of the Habitat Conservation Plan in 2067 (assuming year 2009 starting as Decade zero, we calculated the HCP end point as roughly Decade 5.7). Assuming the current model predictions under the Proposed FEM with no modifications, 2 of the 11 Landscapes will not meet the 40% minimum threshold by the end of the HCP, and 3 of 11 will not meet the Old Forest 20% goal.

#### **FOREST MANAGEMENT FOR RIPARIAN AREAS/FISH**

Although not explicitly stated, but consistently implied throughout the RDEIS, the Landscape Alternative (LA) will increase the number of stand entries within most landscapes in order to decrease stand densities, address forest health and help move a stand from the “Competitive Exclusion” stage to the “Understory Development” stage. While we recognize that this may result in an overall wildlife benefit, depending upon local stand conditions, we are concerned that the increase of stand entries into riparian areas over the No Action Alternative will result in significant adverse impacts, if done without appropriate mitigation measures.

Due to the extreme sensitivity of riparian habitats to disturbance related to sediment delivery, water quality, and stream-associated amphibian and in-stream fish habitat conditions, we are concerned that the increased stand entries will have both project-specific and cumulative impacts with the additional riparian management under the proposed LA.

Table 3-15, Page 3-39, clearly demonstrates that the LA will potentially result in more high impacts within the Clallam, Coppermine, Kalaloch and Reade Hill landscapes, with an overall 3% increase in high impacts. The discussion following this table recognizes the potential environmental impact for the LA with this indicator (harvest methods and number of forest entries), but does not consider it significant in consideration of the entire OESF landscape. The Plan only offers *possible* mitigation to reduce the potentially high impacts in the most impacted landscape (Clallam). There appears to be no commitment by DNR to address this situation in Clallam or any of the other anticipated higher impact landscapes. Possible mitigating measures may include: reduced stand entries, reduced management activities, or lengthening of harvest rotations. We strongly suggest development of landscape-specific mitigation options along with a real commitment by DNR to implement mitigation as necessary (adaptive management) over time.

## **FOREST MANAGEMENT FOR WILDLIFE HABITAT**

### Appendix K Wildlife

For interior forest, our original scoping comments (2007) suggested some spatial analysis of old forest patches created. We are pleased to see that this issue was addressed, and the 100-acre assumption seems reasonable; however, we envisioned some additional spatial analysis of how related the modeled large patches would be (e.g., nearest-neighbor analysis), in order to gauge potential functionality of the interior older forest patches as a measure of landscape continuity or patch connectivity.

### Clarifications needed:

Chart K1: Values on the y-axis need further explanation about what they represent. This chart seems counter intuitive and shows increasing Edge to Area ratio over the entire OESF, while each of the landscapes in general show decreasing E-to-A ratios, which we would support. We suggest clarification or a better explanation?

Charts K-2 to K-15: These captions only indicate Forest (generic); is this correct? If the intent is to characterize Old Forest, we suggest it be clarified, as it is confusing with the subsequent charts.

## **FOREST MANAGEMENT FOR THE NORTHERN SPOTTED OWL**

Regarding forest management and spotted owls, we agree that forest management designed to expedite development of structurally complex forest conditions has the potential to increase functional spotted owl habitat across the OESF. Results of the modeling for the four spotted owl indicators (movement, nesting, roosting and foraging) as they relate to life history requirements and forest management, appear to provide nominal gains in spotted owl habitat over the duration of the planning period (as does the No Action Alternative); the overall difference between the two alternatives is negligible. However, the projected increase in acres of spotted owl habitat under the Landscape Alternative would likely lend itself to more opportunities for adaptive management that may increase spotted owl habitat in the OESF landscape sooner than predicted by the modeling. We support DNR's proposal to employ variable density thinning and variable retention harvest treatments as a means to accelerate the rate of understory development and structurally complex stand types within mature forests. It seems likely that incorporating such harvest strategies will diversify stand structure more quickly than would forest stands left to develop under natural conditions. Applying these harvest strategies will provide important habitat for a suite of wildlife species on a shorter time scale, particularly for those associated with snags and other structures that are generally limited within intensively managed (even-aged harvest) landscapes.

### Appendix F Procedures:

Draft Northern Spotted Owl Management (OESF)

Page 1, 3rd paragraph:

As part of monitoring and validation, we envision that DNR would track blocks of current and future Old Forest through time to assess the likelihood that those patches remain functional and viable through the life of the HCP, as is planned on some other HCP Planning units.

We also suggest that criteria should be enacted for the number of decades that Old Forest is to be retained and available as ecologically functional habitat prior to harvest as anticipated by the FEM (minimum 2 decades? more?). Both owls and murrelets have site fidelity to established nesting areas, and we have concerns as to whether or not there would be adequate time (number of decades) for owls or murrelets to make use of new, suitable Old Forest patches (i.e. successfully reproduce) within their lifespan.

Page 2, 3rd paragraph:

We agree that monitoring forest stands that receive early treatments (VDT or VRH) to track development into older forest habitat conditions is a crucial aspect of the plan. This will be a critical measure of success in reaching the Maintenance and Enhancement Phase of the strategy where the minimum of 20% older forest and 20% young-sub mature forest (40% overall minimum threshold) structure is attained.

## **MARBLED MURRELETS**

It is our understanding that the HCP Long-term Conservation Strategy (LTCS) for Marbled Murrelets on DNR lands, currently being developed with USFWS, will be additive and incorporated into the basic ground-work initiated by this OESF Forest Plan. We respectfully request that any changes in DNR procedures or amendments, concerning the integration of the LCS, be forwarded to WDFW and stakeholders for a review and comment period. It is our understanding that until the Final LTCS is official, the current procedure outlined in Appendix F, Revised DEIS, will remain in place until then.

### **References Cited:**

Desimone, S. M., J. L. Anthony, and E. B. Cummins. 2013. An Evaluation of Marbled Murrelet Habitat Prediction and Survey Implementation in the Washington Department of Natural Resources Straits Planning Unit. Technical Assessment Report, Washington Department of Fish and Wildlife, Olympia, WA.

Duke 1997

WDFW acknowledges the extensive time and commitment in planning for forest management and trust obligations, and preparing the RDEIS for the Olympic Experimental State Forest. As the primary state agency responsible for managing fish and wildlife resources in Washington State, WDFW appreciates the opportunity to provide comments on the OESF Revised DEIS. If you have questions concerning our comments regarding forest management for spotted owls, marbled murrelets, or any other species or habitat, please contact Gary Bell, Forest Wildlife & Habitats Biologist, at (360) 902-2412, Steve Desimone, Wildlife Biologist, at (360) 902-2507, or Terry Jackson, Forest Habitats Section Manager, at (360) 902-2527.

Sincerely,

Gary Bell  
WDFW Fish and Wildlife Biologist  
Forest Wildlife & Habitats

Cc: Steve Desimone  
Joe Buchanan  
Bruce Thompson  
Don Nauer  
Terry Jackson  
Bob Zeigler



State of Washington  
**DEPARTMENT OF FISH AND WILDLIFE**

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December 16, 2013

Washington State Department of Natural Resources  
SEPA Center  
111 Washington Street  
Post Office Box 47015  
Olympia, WA 98504

**SUBJECT: Comments for the Revised Draft Environmental Impact Statement on the Olympic Experimental State Forest (OESF) HCP Planning Unit Forest Land Plan, File No. 10-060101**

Dear DNR SEPA Center:

Thank you for the opportunity to comment on the above referenced Revised Draft Environmental Impact Statement (RDEIS).

The Washington Department of Fish and Wildlife provides recommendations for riparian habitats in our Management Recommendations for Washington's Priority Habitats: Riparian (Knutson and Naef. 1997).

The management recommendations contained in the document are the result of an extensive review of the best available science for riparian ecological function and values in the state of Washington. The recommendations are developed to meet the goal of maintaining or enhancing the structural and functional integrity of riparian habitat and associated aquatic systems needed to perpetually support fish and wildlife population on both the site and landscape levels.

When made available one of the stated uses of the riparian management recommendations was to contribute to the scientific component of planning, protection and restoration efforts for fish and wildlife included in the Department of Natural Resources Habitat Conservation Plan.

The Riparian Habitat Area (RHA) recommended in the Priority Habitats Riparian document are 250 feet on each side of Type 1 and 2 streams, 200 feet on each side of Type 3 streams five to twenty feet wide, 150 feet on each side of Type 3 streams less than five feet wide and 150 to 225

feet on each side of Type 4 and 5 streams depending on low to high mass wasting potential.  
Washington State Department of Natural Resources SEPA Center

Under both the No Action Alternative and the Landscape Alternation of the RDEIS the proposed riparian buffer widths 100 to 150 feet plus floodplain and unstable areas are considerably narrower than those recommended in the Priority Habitat Riparian recommendations and also propose management activities for a number of purposes within these buffer widths.

We understand the concept in the OESF to take management actions within riparian areas to improve stand condition and ecological functions, but do not understand how given the riparian recommendation in our Priority Habitat Riparian document, the buffer widths proposed under both alternatives in the RDEIS can meet the objective of the DNR Habitat Conservation Plan provided below:

**“Objective:** Per the requirements of the OESF **riparian conservation strategy** in the 1997 *Habitat Conservation Plan*, “protect, maintain, and restore habitat capable of supporting viable populations of salmonid species as well as for other non-listed and candidate species that depend on in-stream and riparian environments” on state trust lands in the OESF (DNR 1997, p. IV.106 through 134).”

We recommend that you increase your buffer widths to more closely reflect those identified in our Priority Habitats Riparian document and clearly state that management activities within these buffer areas are intended to meet the objective to “protect, maintain, and restore habitat capable of supporting viable populations of salmonid species as well as for other non-listed and candidate species that depend on in-stream and riparian environments.”

Thank you for the opportunity to provide these comments and recommendations. We provide these comments in our desire to assist DNR in the pursuit of WDFW's goals to manage and perpetuate the State of Washington's salmon and steelhead stocks. If you have any questions regarding this proposal please contact me at (360) 417-1426.

Sincerely,

Chris Byrnes  
Habitat Biologist, WRIAs 18 and 19

Citation: Knutson, K.L., and V.L. Naef. 1997 Management Recommendations for Washington's Priority Habitats: Riparian. Wash. Dept. Fish and Wild., Olympia. 181pp.

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