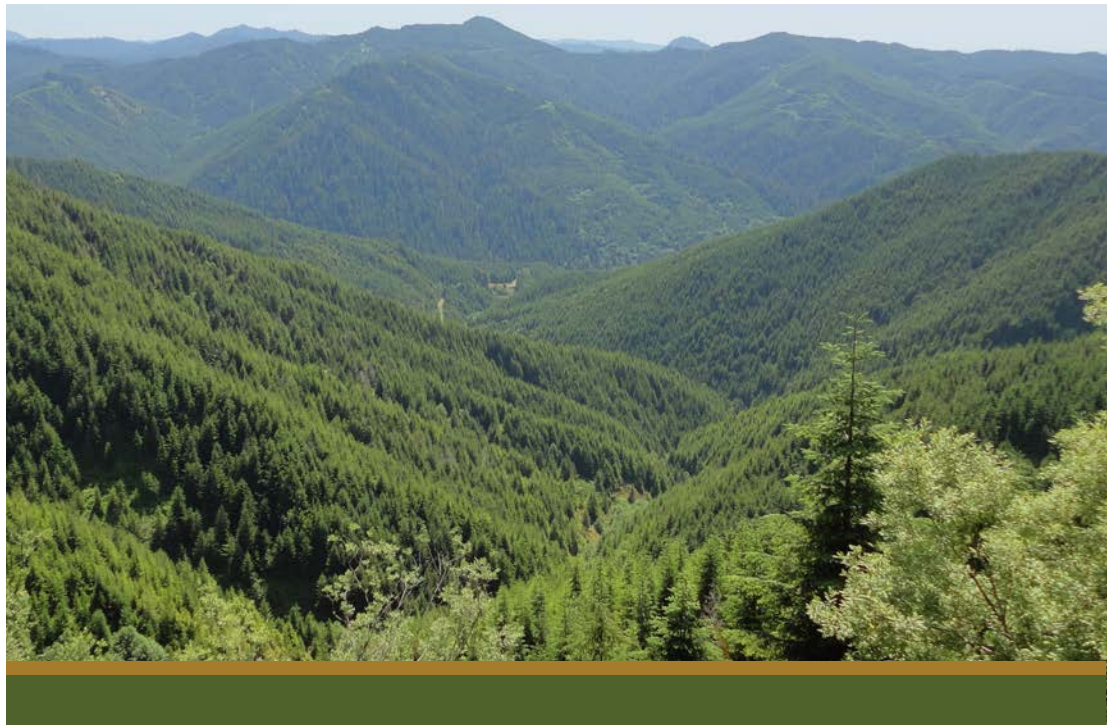


OCTOBER 2013

Olympic Experimental State Forest HCP Planning Unit Forest Land Plan

Revised Draft | ENVIRONMENTAL
IMPACT STATEMENT



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

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IMPACT STATEMENT

Prepared by the
Forest Resources Division
(formerly Forest Resources and Conservation Division)

Forest Informatics and Planning Section
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Responsible Official
Loren Torgerson, Northeast Region Manager



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



Peter Goldmark
Washington State
Commissioner of Public Lands

October 2013

Dear Interested Party,

I am pleased to present the Washington State Department of Natural Resources' (DNR) Revised Draft Environmental Impact Statement (RDEIS) for the Olympic Experimental State Forest (OESF) forest land plan. The OESF, which is one of nine habitat conservation planning units identified in DNR's 1997 *Habitat Conservation Plan*, is located on the west side of the Olympic Peninsula in Clallam and Jefferson counties.

DNR's proposed forest land plan for the OESF will provide foresters and managers with the information they need to design individual management actions, such as timber harvests, to meet DNR's objectives for the OESF. These objectives, which are based on existing DNR policies such as the 1997 *Habitat Conservation Plan* and the 2006 *Policy for Sustainable Forests*, include: 1) healthy riparian areas; 2) biologically diverse, structurally complex forests that support native wildlife species; and 3) a perpetual source of revenue for public schools, universities, and other trust beneficiaries. These objectives will be met through an integrated management approach, in which revenue production and ecological values are integrated across forested state trust lands. (For a description of this approach, refer to Chapter 2 of the RDEIS.)

This RDEIS replaces the Draft EIS (DEIS) for the OESF that was published in 2010. DNR made many improvements based on professional judgment and a careful review of the comments received. I invite you to examine the alternatives, environmental analysis, and draft forest land plan, and to provide us with your comments. Information about submitting comments is included in the fact sheet on the following page. In addition, DNR will hold public meetings in Forks, WA on November 19, 2013 and in Olympia, WA on November 21, 2013 to review the document.

If you have questions, please contact Michelle Peterschick, Outreach Manager for the OESF, at 360-902-1715. Thank you for your interest in the sustainable management of state trust lands.

Sincerely,

Peter Goldmark
Commissioner of Public Lands
Washington State Department of Natural Resources

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Fact Sheet

Title

Olympic Experimental State Forest HCP
Planning Unit Forest Land Plan Revised Draft
Environmental Impact Statement

Description of Proposal

The action proposed by the Washington Department of Natural Resources (DNR) is to develop and implement a forest land plan for the management of state trust lands in the Olympic Experimental State Forest (OESF). The OESF is located in western Clallam and Jefferson counties on the Olympic Peninsula in Washington State.

A forest land plan is a document that defines what DNR wishes to achieve and how it will achieve it. Forest land plans include goals, objectives, and the management strategies that will be used to meet them.

DNR is proposing two alternatives for the OESF forest land plan. The No Action Alternative represents DNR's current management practices. Under this alternative, DNR will design timber sales one watershed at a time using maps, databases, and other existing tools.

Under the Landscape Alternative, DNR will design timber sales across state trust lands using the forest estate model. The forest estate model, which is a mathematical computer model of the forest, recommends a series of management actions and projects how the forested landscape will change over time as trees grow and stands are harvested. DNR will use these projections to guide the location and design of timber sales, and to evaluate whether planned management activities may enable DNR to meet its objectives.

Project Proponent and Lead Agency

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Some photos used courtesy of FEMA, USFWS,
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Date of Issuance of Revised Draft Environmental Impact Statement (RDEIS)

October 31, 2013

Next Actions

December 16, 2013: End of 45-day comment period

Late 2014 (projected, subject to change):
Publication of Final EIS and adoption of the final forest land plan

Final Action

The final action is approval of a final forest land plan for the OESF. The final forest land plan will follow the release of the Final EIS.

RDEIS Comment Period

October 31, 2013 to December 16, 2013

Comments must be received by December 16 at 5:00 PM. Comments may be submitted electronically via e-mail or attachments sent to sepacenter@dnr.wa.gov or mailed to the address listed under "Contact."

Public Meetings for OESF RDEIS

November 19, 2013, 6:30 - 8:30 pm
DNR's Olympic Region Office
411 Tillicum Lane, Forks, WA

November 21, 2013, 6:30 - 8:30 pm
Natural Resources Building, Room 172
1111 Washington Street SE, Olympia, WA

Location, Availability, and Cost of Copies of this RDEIS and Supporting Documents

This RDEIS is available on the internet at www.dnr.wa.gov/ResearchScience/sepa.

Copies also are available to read at select public libraries. These libraries are listed in Appendix N.

A very limited number of printed copies are available at no charge. CD copies also are available at no charge. Requests for printed copies, CDs, or supporting documents, listed below, may be mailed to the address listed under "Contacts." After the copies are distributed, additional copies will be available for the cost of printing or CD production, per RCW 42.17.

Copies of the DEIS and the supporting documents upon which the Alternatives are based—2006 *Policy for Sustainable Forests*, 2004 *Final EIS for Sustainable Forest Management*, 1997 *Habitat Conservation Plan*, Washington Forest Practices Rules—are available for review at each of the five Westside DNR Region Offices in Washington, and at the DNR SEPA Center at 1111 Washington Street, Olympia. These documents can also be found online at www.dnr.wa.gov.

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Acronyms

DEIS	Draft environmental impact statement
DNR	Washington Department of Natural Resources
EIS	Environmental impact statement
FEIS	Final environmental impact statement
FEMAT	Forest Ecosystem Management Assessment Team
GIS	Geographic information system
GNN	Gradient nearest neighbor
MMBF	Millions of board feet
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
OESF	Olympic Experimental State Forest
OWEB	Oregon Watershed Enhancement Board
PFMC	Pacific Fisheries Management Council
RCW	Revised code of Washington
RDEIS	Revised draft environmental impact statement
SEPA	State Environmental Policy Act
USDA	United States Department of Agriculture
USDOI	United States Department of the Interior
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

Other Terms

Ecology	Washington Department of Ecology
Federal Services	USFWS, NOAA Fisheries
Board	Board of Natural Resources

Executive Summary



Purpose, Need, and Objectives

Proposed Action

The action proposed by the Washington Department of Natural Resources (DNR) is to develop and implement a forest land plan for the management of state trust lands in the Olympic Experimental State Forest (OESF). A forest land plan is a document that defines, for a planning area such as the OESF, *what* DNR wishes to achieve and *how* it will achieve it. The proposed action includes the related tasks of updating existing procedures as needed and developing a new procedure for salvaging timber after natural disturbance events such as wind or fire.

The forest land plan will be based on current DNR policies including the 1997 *Habitat Conservation Plan*¹ and 2006 *Policy for Sustainable Forests*² as well as all applicable local, state, and federal laws. The 1997 *Habitat Conservation Plan*, which is authorized under the Endangered Species Act (16 U.S.C. 1531 et seq.), is a long-term (at least 70 years) management plan to maintain and improve habitat for threatened and endangered species, along with unlisted native species on state trust lands within the range of the northern spotted owl. The 2006 *Policy for Sustainable Forests* guides DNR's management and stewardship of 2.1 million acres of forested state trust lands. As will be discussed later in this summary, DNR cannot change its policies through this planning process.

Purpose of the Proposed Action

The 1997 *Habitat Conservation Plan* includes an overview of DNR’s management approach for state trust lands in the OESF and a set of conservation strategies, each of which includes objectives that DNR must meet. The purpose of the proposed action is to **determine how to implement the management approach and conservation strategies for state trust lands in the OESF described in the 1997 *Habitat Conservation Plan* while also meeting DNR’s fiduciary responsibility to provide revenue to trust beneficiaries through the sale of timber.**

The proposed forest land plan will include DNR’s management approach, the objectives that DNR must meet, the management strategies that will be used to meet them, the harvest methods that DNR will use, and other information. It will *not* include site-specific designs for individual management activities such as building a segment of road or harvesting a certain stand of timber. Those activities are designed at a later stage of planning, as will be explained later in this summary.

Need for the Proposed Action

DNR needs to develop a forest land plan to meet the policy direction in the 1997 *Habitat Conservation Plan* and the 2006 *Policy for Sustainable Forests*.

- The 1997 *Habitat Conservation Plan* states that “DNR expects landscape planning to be part of the process for implementing conservation strategies” in each *Habitat Conservation Plan* planning unit, including the OESF (DNR 1997, p. IV.192).
- The 2006 *Policy for Sustainable Forests* states that “In implementing Board of Natural Resources policy, the department will develop forest land plans at geographic scales similar to DNR’s [1997] *Habitat Conservation Plan* planning units” (DNR 2006, p. 45).

DNR’s Management Approach

DNR’s management approach for state trust lands in the OESF, as envisioned in the 1997 *Habitat Conservation Plan*, is integrated management. This experimental approach is based on the principle that a forested area can be managed to provide both revenue production (primarily through the harvesting of trees) and ecological values (such as biodiversity) across its width and breadth (refer to Text Box ES-1). The integrated management approach is different than the more common approach of dividing a forested land base into large blocks that are managed for a single purpose, such as a nature preserve managed for ecological values or a commercial forest managed for revenue production.

The intent behind integrated management is to actively manage as much of the forested land base as possible to provide both revenue production and ecological values. Active management includes planting trees, managing vegetation, thinning forests, and performing stand-replacement harvests (refer to Text Box ES-2). Each of these “human-influenced disturbance” activities is designed to encourage the development, through natural growth processes, of conditions that support both revenue production and ecological values.

Text Box ES-1. Ecological Values

Ecological values are defined by DNR as the elements (for example, trees, wildlife, soil, water) and natural relationships between them that are biologically and functionally important to the continued health of the forest ecosystem (DNR 1991). DNR has defined four categories of ecological values for state trust lands in the OESF (DNR 1991).

- **Long-term site productivity:** The ability of an area to support plants and wildlife.
- **Riparian areas and aquatic habitat:** Riparian areas are where aquatic and terrestrial ecosystems interact. Aquatic habitat includes streams and other bodies.
- **Biological diversity:** The full range of life in all its forms (Washington Biodiversity Council).
- **Ecosystem resilience:** The ability of an ecosystem to recover from disturbance.

DNR's objectives for northern spotted owls, riparian areas, marbled murrelets, and multiple species contribute to ecological values.

Text Box ES-2. Definitions of Management Terms

- **Management activity:** Any activity done on the ground for the purpose of managing state trust lands; examples include road building, road maintenance, and active management of forest stands.
- **Active management:** Planting trees, managing vegetation, thinning forests, and performing stand-replacement harvests.
- **Stand replacement harvest:** A timber harvest in which most trees are removed and replaced with a new forest stand. DNR uses a harvest method called variable retention in which snags, down wood, and other forest structures are retained at the time of harvest. The forest stand either regenerates naturally or is planted with young trees. Refer to Text Box 3-1 in Chapter 3.

The integrated management approach does not imply that every acre of state trust lands in the OESF must contribute equally to both revenue production and ecological values; nor does it imply that all areas will be actively managed. Some areas, because of their physical characteristics or their importance to ecological values (or both), provide limited support for revenue production. Other areas are *currently* deferred from harvest of timber, meaning they are not currently available or scheduled for harvest per current policy or other reasons.³

One of the challenges of the integrated management approach is to a) understand the contribution different areas can make toward revenue production and ecological values over time, and b) balance management accordingly. Forests are never static. As they change over time through harvest, natural growth, and natural disturbances, their contribution to revenue production and ecological values changes also. Such changes must be factored into planning and management.

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**.⁴ Adaptive management is a formal process for continually improving management practices by learning from the outcomes of operational and experimental approaches (Bunnell and Dunsworth 2009).

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 landscapes⁵ 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).

DNR’s management approach and conservation strategies for state trust lands in the OESF will be described in more detail in Chapter 2 of the RDEIS.

Can DNR Change Its Policies Through This Forest Land Planning Process?

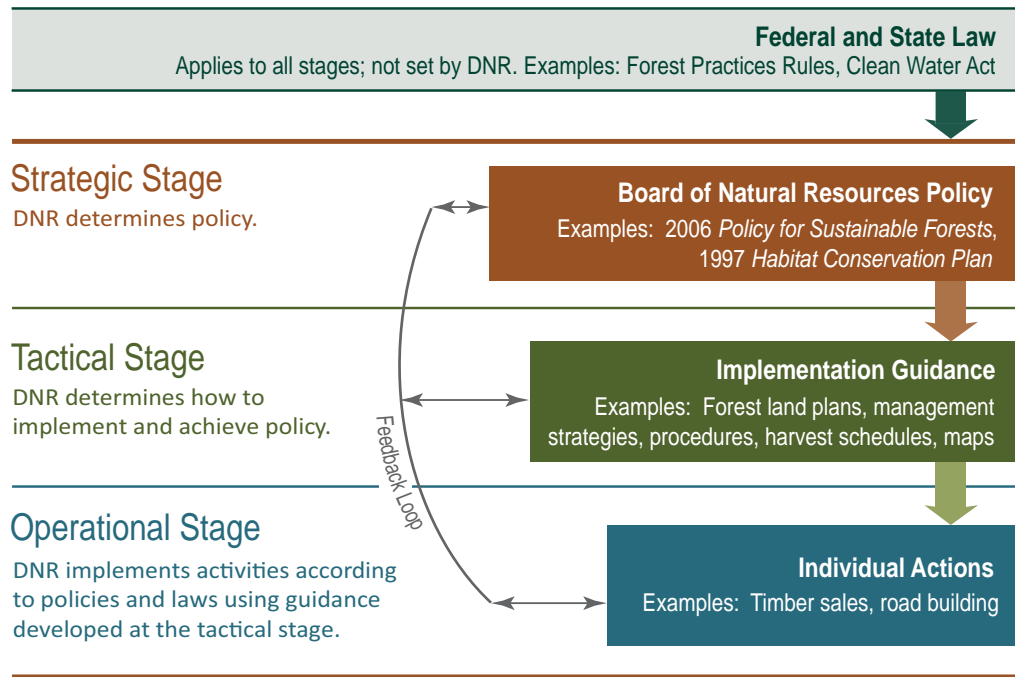
DNR cannot change its policies through this forest land planning process: **DNR cannot propose, select, or implement any management approach, objective, or strategy that lies outside the direction of current DNR policies.** To understand why, it is necessary to understand DNR’s planning process. The process has three stages: strategic, tactical, and operational (refer to Figure ES-1).

- Policies are developed at the **strategic stage** of the planning process. Policies define DNR’s basic operating philosophy, set standards and objectives, and provide direction upon which subsequent decisions can be based. All policies are written in the context of local, state, and federal laws, and are approved and adopted by the Board.
- At the **tactical stage** of planning, DNR determines *how* it will implement and achieve policies developed at the strategic stage. At the tactical stage, DNR develops forest land plans, management strategies, procedures, maps, models, databases, and other guidance.

Although DNR does not change existing policies at the tactical stage, the planning process includes a feedback loop. The information gathered to develop and implement forest land plans may be used to inform future policy decisions.

- Site-specific activities such as individual timber sales are designed at the **operational stage** of planning using the guidance developed at the tactical stage. Management activities must comply with all applicable local, state, and federal laws as well as policies developed at the strategic stage.

Figure ES-1. DNR’s Planning Process



State Environmental Policy Act (SEPA) (43.21C RCW) review occurs at each stage of planning. Policies are evaluated at the strategic phase, forest land plans are reviewed at the tactical stage, and site-specific projects or actions, such as an individual timber sale, are evaluated (if required) at the operational stage as they are proposed.⁶ Therefore, this forest land plan is part of a phased review under WAC 197-11-060 (5)(c)(i).

Not all activities completed in the operational phase require SEPA review. For example, pre-commercial thinning⁷ and tree planting are Class I forest practices⁸ and so are categorically exempt from SEPA review, as described in RCW 43.21C.037.

What If DNR Policies Change During Plan Implementation?

DNR recognizes that economic, social, political, and cultural changes over time may result in a change in DNR policies or state or federal laws. DNR may also update its policies as a result of new scientific information. Changes in policy or laws may require an update or amendment to the proposed forest land plan.

Two DNR policies currently being developed in separate planning processes are the **long-term Marbled Murrelet Conservation Strategy** and the next **sustainable harvest calculation**. The long-term Marbled Murrelet Conservation Strategy will help conserve marbled murrelet habitat while allowing timber harvest and other activities. The sustainable harvest calculation sets the next sustainable harvest level, or the volume of timber scheduled to be offered for sale from state trust lands during a planning decade. Since the OESF is a separate sustainable harvest unit, it will be assigned its own level. These policies are being developed in separate planning processes and both will undergo environmental analysis and public review as part of those processes. Adoption of these policies may lead to an amendment of the forest land plan.

For this RDEIS, DNR assumes that policies and laws *will not change* during the next 100 years (a 100-year period was used for this analysis; refer to “Why 100 Years?” on page ES-9 for more information). In other words, DNR did not analyze future policy changes in this RDEIS because it is not possible to predict those changes.

Analysis Area

In the 1997 *Habitat Conservation Plan*, DNR designated nine habitat conservation planning units within the range of the northern spotted owl in Washington. One of these units is the OESF. For simplicity, in this RDEIS “OESF habitat conservation planning unit” has been shortened to “OESF.”

Where Is the OESF?

The OESF is located in western Clallam and Jefferson counties on the Olympic Peninsula. It is bordered approximately by the Pacific Ocean to the west, the Strait of Juan de Fuca to the north, and the Olympic Mountains to the east and south (refer to Map ES-1⁹).

Map ES-1. OESF Vicinity Map



How Was the OESF Delineated?

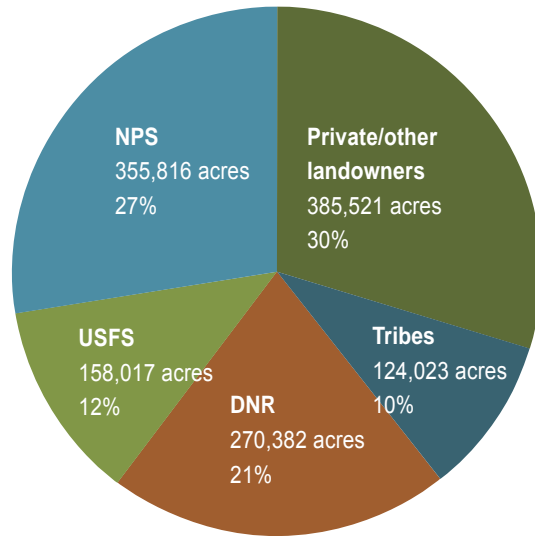
The OESF was delineated by combining all or part of three water resource inventory areas: all of water resource inventory area 20 (Soleduck/Hoh) and portions of water resource inventory areas 19 (Lyre/Hoko) and 21 (Queets/Quinault). Water resource inventory areas are established by the Washington State Department of Ecology (Ecology) and other state natural resources agencies for planning and managing the state’s major watersheds.

How Much of the OESF Does DNR Manage?

The OESF boundaries encompass lands managed by DNR as well as the United States Forest Service (USFS), National Park Service (NPS), private landowners (including timber companies), tribes, and others. DNR manages 21 percent, or 270,382 acres, of the approximately 1.3 million acres of the OESF (refer to Chart ES-1). That total includes

3,008 acres of natural resources conservation areas, 504 acres of natural area preserves,¹⁰ and 266,870 acres of state trust lands. (Refer to “What Are State Trust Lands?” later in this summary.) In this RDEIS, the term “OESF” refers to the entire planning area, including lands owned and managed by other landowners.

Chart ES-1. Land Ownership in the OESF



Will the OESF Forest Land Plan Affect Other Landowners?

DNR’s proposed forest land plan will not affect management of lands owned or managed by other landowners in the OESF. DNR’s **forest land plan applies *only* to the management of state trust lands located within the OESF boundaries.**

What Are State Trust Lands?

In this RDEIS, when DNR uses the term state trust lands, DNR is referring to both State lands and State forest lands in the OESF.

- State lands** (RCW 79.02.010(14)): Shortly before Washington became a state in 1889, Congress passed the Enabling Act (25 U.S. Statutes at Large, c 180 p 676) to grant the territory more than 3 million acres of land as a source of financial support, primarily for its public schools and colleges. Unlike states that sold many of their federally granted lands early in the 1900s, Washington retained ownership of most of these lands and continues to manage them to provide revenue and other benefits to the people of Washington (DNR 2006). These lands are called State lands.
- State forest lands** (RCW 79.02.010(13)): Other lands were acquired by Washington from the counties. By the 1930s, counties had acquired 618,000 acres of foreclosed, tax-delinquent, cut-over, and abandoned forestlands. These scattered lands were difficult for the counties to manage, so the Washington State Legislature directed the counties to deed these lands to the state. The legislature directed that they be held and managed in trust, the same as State lands. These lands are called State forest lands.

State trust lands are held as fiduciary trusts to provide revenue to specific trust beneficiaries. Of the current 5 million acres of state trust lands statewide, roughly 2 million are forested and 1 million are in agricultural production. The remaining 2 million acres are aquatic lands. Refer to Appendix A (draft forest land plan), Chapter 1 for a list of trust beneficiaries and a map showing the location of trust assets in the OESF.

Alternatives

What Are the Alternatives?

DNR is proposing two alternatives for this proposed action, the **No Action Alternative** and the **Landscape Alternative**. As implemented on the ground, the two alternatives should look similar and have similar environmental impacts, primarily because both alternatives are required to implement, not change, existing DNR policies. The primary difference between the alternatives is **how DNR will implement integrated management**.

- Under the **No Action Alternative**, DNR will design one timber sale, one watershed at a time using maps, databases, and other existing tools.
- Under the **Landscape Alternative**, DNR will design timber sales across state trust lands in the OESF using the outputs of computer models. DNR calls this approach “planning from a landscape perspective.” Planning from a landscape perspective involves using computer models to understand how management actions taken today will affect the future condition of the forest and DNR’s ability to meet multiple objectives over time.

DNR uses a mathematical computer model called the forest estate model. Capable of manipulating vast quantities of data, the forest estate model is built with information on current conditions, objectives, and management activities, and an understanding of natural growth processes and how forests respond to management activities. The forest estate model simultaneously considering all of this information and develops an optimal solution of which forest stands to harvest (when, where, and by what harvest method) and which stands not to harvest across state trust lands over 100 years to meet both revenue production and ecosystem values objectives as effectively and efficiently as possible. The model provides two major types of outputs: a **harvest schedule**, which is the model’s solution in list and map form, and a **state of the forest file**, which is a forecast of forest conditions that are projected to occur as a result of implementing the harvest schedule.

WHY 100 YEARS?

DNR ran the model using a 100-year analysis period because this period is long enough to identify potential changes to the environment. **This does not imply that DNR planned 100 years of harvests.** Instead, DNR generated projections that will enable it to determine whether timber harvests planned today will enable DNR to meet its long-term objectives.

HOW WILL THE MODEL OUTPUTS BE USED?

DNR will use the state of the forest file to a) evaluate whether planned management activities may enable DNR to meet its objectives, and b) evaluate the potential environmental impacts of the alternatives (refer to “How are the Indicators Analyzed?” on p. ES-13.).

The harvest schedule will be used to guide the location and design of timber sales. **It is important to understand that timber sales may not be implemented on the ground exactly as they were modeled.** Although the forest estate model is a powerful tool that represents current knowledge and data about current conditions and forest ecosystems, it

is essentially a mathematical representation or simplification of complex natural systems. It cannot replace the professional role and judgment of foresters working in the field.

When the timber sales are designed on the ground, sale boundaries suggested by the model may be adjusted to accommodate unmapped streams, potentially unstable slopes, or other features. In addition, the model may select areas to harvest that are too small, difficult, or expensive to harvest; such areas may be left unharvested or combined with an adjacent harvest in a future decade. As the forest land plan is implemented, information gathered in the field will be incorporated into the model to improve its accuracy and inform future management decisions. The model will be rerun periodically to reflect updated information and keep DNR on track to meet its objectives.

Similarities Between the Alternatives

Both of DNR’s alternatives meet all applicable **federal and state laws**. Examples of applicable laws include the Shoreline Management Act (90.58 RCW), which protects valuable shoreline resources, and the Clean Water Act (33 U.S.C. §1251 *et seq.* [1972]), which established the basic structure for regulating the discharge of pollutants into the waters of the United States. The Clean Air Act (70.94 RCW), SEPA, Multiple Use Act (70.10 RCW), and the Endangered Species Act and certain local laws also affect the management of state trust lands. Both alternatives **meet current DNR policies**, including the integrated management approach and the major habitat conservation strategies for state trust lands in the OESF described in the 1997 *Habitat Conservation Plan* (riparian, northern spotted owl, multispecies, and marbled murrelet). Both alternatives **incorporate all applicable current procedures** (a list of procedures can be found in Appendix F).

Finally, both alternatives include the **development of a forest land plan** as required by current policy direction. The forest land plan will be based on the final selected alternative. The final selected alternative may not be identical to either of DNR’s alternatives but will be within the range analyzed in this RDEIS. For example, the decision maker may incorporate elements from one alternative into another. The alternatives are described in detail in Chapter 2 of this RDEIS.

Why Is There Only One Action Alternative?

Any action alternative for DNR’s proposed action of developing and implementing a forest land plan must **enable DNR to meet its objectives** in the context of the integrated management approach, and must also meet DNR’s current policies. Under SEPA, DNR is required to consider action alternatives that are reasonable. A reasonable alternative is one that could 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)). DNR considered multiple action alternatives but only one, the Landscape Alternative, met DNR’s objectives and the requirements described in DNR’s statement of purpose, need, and objectives.

Environmental Analysis

This RDEIS is not meant to be a site-specific analysis of the potential impacts of specific management activities such as individual timber sales or design of specific sections of roads; those impacts are analyzed at the operational stage of planning. This RDEIS is an analysis of a non-project action (development and implementation of a forest land plan). According to SEPA (43.21C RCW), 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 (WAC 197-11-704(2)(b)). Future management actions depend, in part, on the decisions made during this planning process, but no specific on-the-ground activities are designed as part of this process.

The Role of SEPA

The intent behind SEPA is to ensure that environmental values are considered during decision-making by state and local agencies (Ecology 1998).

What Were the Preliminary Steps?

In August 2007, DNR issued a “Determination of Significance and Request for Comments on Scope of Environmental Impact Statement for the Development of a Forest Land Plan for the Olympic Experimental State Forest.” This document determined that an environmental impact statement (EIS) would be required under SEPA. An EIS is required for a non-project action such as a forest land plan when that plan has the potential to have probable significant adverse environmental impacts.

DNR held three public workshops (in Forks, Port Angeles, and Port Hadlock, Washington) in June 2007 to discuss the proposed forest land plan. Public notices and press releases invited interested people to attend these workshops. In addition, invitations were sent to individuals and organizations interested in management decisions about state trust lands. These stakeholders included recreation groups, environmental organizations, representatives of the timber industry and local communities, and trust beneficiaries.

About 50 people participated in these workshops. The attendees offered local information and expressed their concerns about state trust lands in the OESF. Participants listened to a presentation on the preliminary stages of planning and then shared information with DNR. Participants also discussed how they use the forest and presented their ideas about forest management activities in specific areas.

Project Scoping

DNR initiated the scoping process—defining the issues to be discussed in the EIS—in August 2007 by holding three public meetings. Like the public workshops, these meetings were held in Forks, Port Angeles, and Port Hadlock. During these meetings, DNR heard comments regarding its management of state trust lands from concerned citizens and organizations. Their comments captured diverse and sometimes conflicting opinions and ideas. The comments were summarized by subject, and responses were provided in August 2009 (refer to Appendix B). DNR’s professional judgment and careful review of the comments helped DNR focus the environmental analysis on areas of concern, eliminate less significant impacts from detailed environmental study, and identify reasonable

management alternatives to be analyzed in the EIS. The opportunity to comment during the scoping process helped promote public interaction.

Draft EIS (DEIS)

Once scoping was completed, DNR prepared a DEIS. In this document, DNR analyzed each alternative to identify potential probable, significant, and adverse environmental impacts. As part of this analysis, DNR also identified mitigation. DNR submitted the DEIS for comments from June 1 to July 15, 2010. Public hearings were held on June 16 in Port Angeles and June 17 in Forks.

Revised Draft EIS (RDEIS) and Draft OESF Forest Land Plan

Because of comments received on readability and other issues, DNR decided to revise the DEIS to make it easier to read and understand and publish it as an RDEIS. This RDEIS is a stand-alone document that replaces the DEIS.

As part of this process, DNR developed a draft forest land plan for the OESF (refer to Appendix A). The draft plan, which implements the Landscape Alternative, is provided to help the reader understand what a forest land plan is.

What Are the Next Steps?

The comment period begins when the RDEIS is released. The comment period gives the public a chance to comment on the RDEIS and draft forest land plan. After the comment period, DNR will prepare a final EIS (FEIS). Once the FEIS is published, DNR's decision maker will select a final alternative or combine elements of both alternatives. While the final selected alternative may not be identical to any one alternative presented in the FEIS, it will be within the range analyzed. The final step is to develop a final forest land plan based on the selected alternative. Once completed, the plan will be provided to the DNR decision maker for adoption.

Who Is the Decision Maker?

The Deputy Supervisor for Uplands is the decision maker. The Deputy Supervisor is responsible for selecting a final alternative. To make this decision, the Deputy Supervisor will consider the potential environmental impacts of the alternatives; the ability of the alternatives to meet DNR's purpose, need, and objectives as described in the FEIS; and potential financial impacts to the trusts. The decision will be made with input from DNR staff and consultation with the Commissioner of Public Lands. The Deputy Supervisor is also responsible for adopting the final forest land plan.

Analysis Methodology

What Topic Areas Does This Analysis Include?

Forest conditions as a whole are analyzed in “Forest Conditions and Management,” p. 3-21. DNR also provides detailed analysis for the following topics: soils, riparian, water quality, fish, wildlife, northern spotted owls, and climate change.

How Is Each Topic Analyzed?

To analyze each topic, DNR uses criteria and indicators. Criteria are broad concepts, such as forest health or functioning riparian habitat. Indicators are the specific, quantitative means by which the criteria are measured. For example, the indicator stand density (crowding of forest stands) is used to measure the criterion forest health, and the indicator stream shade is used to measure the criterion functioning riparian habitat. Each criterion may have one or more indicators. This approach is based on the Montréal Process, which was established to advance the development of internationally agreed-upon criteria and indicators for the conservation and sustainable management of temperate and boreal forests (Montréal Process 1995).

DNR used its expertise, existing scientific information, and current data to select the criteria and indicators that would best describe the potential environmental impacts of the two alternatives. Each topic area (such as “Northern Spotted Owls,” “Riparian,” and “Water Quality”) has its own set of criteria and indicators. The criteria and indicators used to address the forest as a whole are described in “Forest Conditions and Management.”

OVERLAPPING INDICATORS

Forests are complex, interrelated natural systems. Few indicators will apply to only one topic in this RDEIS; many will overlap. For example, the amount of stream shade provided by the riparian forest affects both water quality and fish.

DNR analyzes each overlapping indicator in the section to which it most logically applies. Stream shade, for example, is analyzed in “Riparian.” Subsequent sections which use these indicators, such as “Water Quality,” include a brief summary of the indicator and additional information about that indicator specific to the topic being discussed.

Additional indicators could have been used to evaluate the criteria. However, DNR used its expertise to determine which indicators were best to use with the scientific data that is currently available from Ecology, USFS, DNR, and other sources. DNR believes that the selected indicators are sufficient to understand how the criteria are affected.

How Are the Indicators Analyzed?

DNR’S FOREST ESTATE MODEL

This environmental analysis is based primarily on the outputs of the forest estate model (plus consideration of mitigation through current management practices, as will

be described later in this summary). To deepen its understanding of potential environmental impacts for specific topic areas, DNR also developed computer models for northern spotted owl territories and habitat, windthrow, and each riparian indicator. Each of these models was developed using data from the forest estate model and other data and information. (For more information on riparian and windthrow models, refer to Appendix G, and for more information on northern spotted owl territory and habitat models, refer to Appendix I.)

As explained previously, the forest estate model will be used to implement the Landscape Alternative *only*; the model will *not* be used to implement the No Action Alternative. However, in order to assess the potential environmental impacts of the two alternatives for this RDEIS, **it was necessary to run the forest estate model for both alternatives.**

For this RDEIS, with the exception of road-related indicators, **DNR analyzes, for each alternative, the potential environmental impacts of implementing the harvest schedule across state trust lands in the OESF. DNR analyzes harvests exactly as modeled, with no modifications.**

For some indicators, DNR uses the state of the forest file as well as the territory, habitat, windthrow and riparian indicator models to identify trends of change in forest ecosystems; for example, an increase or decrease in the risk of forest health issues due to overcrowded forest stands. DNR uses these trends to identify potential environmental impacts for this RDEIS analysis.

THREE TYPES OF INDICATORS

In this RDEIS, DNR uses three types of indicators: those that measure the frequency and intensity of projected harvest activities, those that measure changes to forest conditions that may result from those activities, and those that measure the road network:

- **Frequency and intensity of projected harvest activities:** For these indicators, DNR analyzes the frequency and intensity of harvest activities that are projected to occur under either alternative over the next 100 years. For example, for the indicator “harvest methods and number of forest stand entries,” DNR identifies combinations of projected harvest activities that could result in potential high impacts, such as three stand replacement harvests of the same stand over the 100-year analysis period.
- **Forest conditions:** For these indicators, DNR compares current forest conditions to future forest conditions that are projected to result from implementing either alternative. For example, for the indicator “northern spotted owl habitat,” DNR considered whether the number of acres of habitat is projected to increase, decrease, or remain the same over time (as compared to current conditions) under each alternative.
- **Road network:** These indicators measure the location and extent of the current road network. Because DNR does not anticipate major changes to the road network over the next 100 years, results are based on current conditions. Refer to “Water Quality,” p. 3-115 for more information.

ANALYSIS PROCESS

Step One: Assigning Potential Low, Medium, or High Impact Ratings

In this RDEIS, DNR first quantifies potential environmental impacts for each indicator as low, medium, or high using parameters defined for each indicator. The exact meaning of each term (low, medium, high) is specific to each indicator. For example, some low and medium impacts are potentially beneficial (an improvement in conditions), while others are potentially adverse but not significant. For this analysis, only high impacts are considered potentially significant impacts.

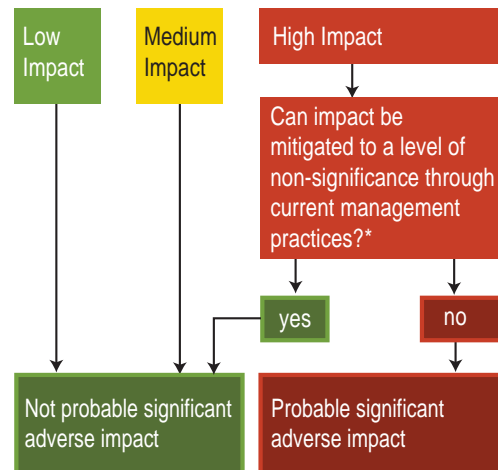
It is important to understand that **DNR first assigns potential low, medium, or high impact ratings by analyzing management activities *exactly* as they were modeled or mapped, without considering current management practices that are expected to mitigate potential high impacts.** For example, DNR first analyzes potential impacts from roads based on a straightforward assessment of the mapped size and location of the road network. In this step, DNR assumes that all roads that have not been certified as abandoned¹¹ can contribute sediment to streams, even though some of these roads have been mitigated already (or will be mitigated in the future) through current management practices to prevent the delivery of sediment from roads to stream channels. (Mitigation of the road network through current management practices is discussed in “Water Quality” on p. 3-131.) **Mitigation is not considered until the second step of DNR’s analysis process.**

Step Two: Determining if Impacts are Probable Significant Adverse

In this step, DNR considers the full range of its current management practices to identify particular programs, rules, procedures, or other measures that are expected to mitigate a potential high impact to a level of non-significance. If an impact will be mitigated, it is not considered probable significant adverse (refer to Figure ES-2). For each indicator, DNR describes the specific management practice(s) that will be used to mitigate a potential high impact. DNR may also determine if a potential high impact is significant based on the role the indicator plays in ecological function.

If a potential high impact will not be mitigated through current management practices, and the indicator plays an important role in ecological function, the potential high impact is considered probable significant adverse. For these indicators, DNR describes *possible* mitigation. Unlike mitigation through current management practices, possible mitigation is something that DNR *may* do to reduce a potential high impact to a lower level. It is suggested, not required.

Figure ES-2. Determining Impacts for Each Indicator



*DNR may also consider the indicator’s role in ecological function to determine significance

Although DNR may adopt possible mitigation in the future, DNR is not committed to implementing it at this time. Possible mitigation includes site-specific mitigation that foresters may suggest to further reduce potential impacts at the time of an individual management activity. Site-specific mitigation is considered under SEPA as part of the SEPA review for each activity. Possible mitigation is mentioned but not analyzed in this RDEIS.

For each topic, DNR provides a detailed explanation of how each indicator is measured; the thresholds used to measure it; the specific meaning of low, medium and high in the context of that indicator; the mitigation that applies to that indicator; and the final determination of whether the impact is a probable significant adverse impact. To assist the reader, DNR uses color-coded symbols in tables throughout this RDEIS. A green circle indicates a potential low impact, a yellow diamond indicates a potential medium impact, and a red square indicates a potential high impact.

WHAT SPATIAL SCALE(S) DOES DNR USE FOR EACH INDICATOR?

DNR analyzed each indicator at the spatial scale that it considers most meaningful. For example, peak flow (an indicator for functioning riparian habitat) is analyzed at the scale of the Type 3 watershed, while carbon sequestration (an indicator for climate change) is analyzed at the scale of state trust lands in the OESF. Scales are chosen based on existing literature, available data, and professional judgment. In some cases, multiple scales are used to provide a more comprehensive understanding of potential impacts. Figure ES-3 illustrates the spatial scales used in this analysis. Table ES-1 lists the scales used for indicators under each topic.

Figure ES-3. Spatial Scales Used to Plan and Manage State Trust Lands in the OSEF

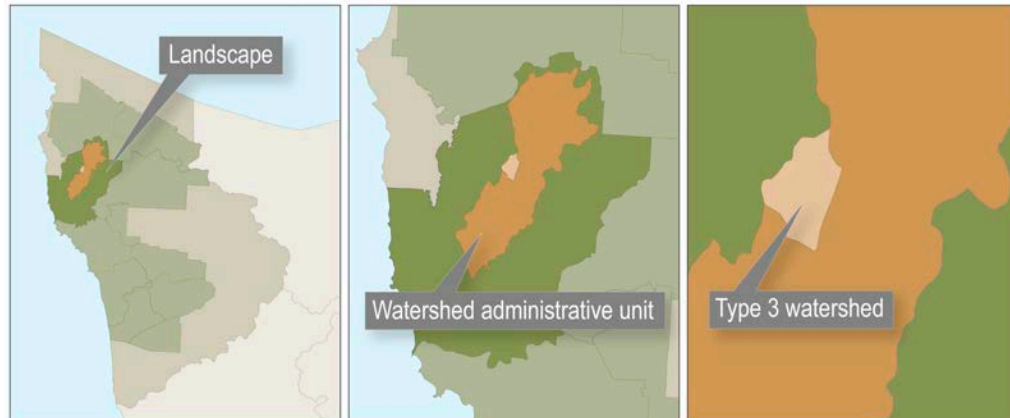


Table ES-1. Scale of Analysis by Topic

Topic	Scale of analysis
Forest Conditions and Management	State trust lands in the OESF, landscape; results at watershed administrative unit and Type 3 watershed scale are presented in Appendix E
Riparian	Type 3 watershed, stream reach
Soils	Landscape, watershed administrative unit
Water Quality	Landscape, Type 3 watershed
Fish	Stream reaches that are considered essential habitat for certain species of fish ^a
Wildlife	State trust lands in the OESF
Northern Spotted Owls	State trust lands in the OESF, landscape
Climate	State trust lands in the OESF

^aThe term essential habitat is used solely for the purpose of conducting this environmental impact analysis and does not connote or imply DNR policy direction.

Harvest Schedule Analyzed Under Each Alternative

As explained previously, the forest estate model produces a harvest schedule for each alternative. Differences between the harvest schedules are due to differences between the alternatives. In general:

- The **total area harvested** is projected to be slightly larger (2,373 acres) under the Landscape Alternative than under the No Action Alternative.
- Each harvest of a forest stand, such as a thinning, is called a **forest stand entry**. Forest stand entries are projected to be more frequent under the Landscape Alternative than under the No Action Alternative.
- Generally speaking, **more acres are scheduled for harvest each decade** under the Landscape Alternative than under the No Action Alternative.
- The Landscape Alternative is projected to have 15 percent more acres of **variable density thinning** and 8 percent more acres of **variable retention harvest**.¹²
- **Harvest volumes** are similar under each alternative but slightly higher under the Landscape Alternative.

Harvest volume is not a focus of this RDEIS because, when considered alone, harvest volume does not adequately describe either the differences between the alternatives or their respective potential environmental impacts. For example, a similar harvest volume under each alternative could have different impact levels depending on the frequency of harvest entries, the proximity of the harvests to streams, and numerous other factors.

For that reason, DNR uses indicators that are more descriptive of potential impacts. More particularly, DNR uses indicators that examine how often, and by what method an area is projected to be harvested; the forest conditions that are projected to result from those harvests; and how projected harvests may affect soils, water quality, riparian function, fish, and wildlife.

Is DNR Proposing to Change the Sustainable Harvest Level Through This Planning Process?

DNR is *not* proposing to change the current sustainable harvest level for the OESF through this planning process. As explained under “Can DNR Change Its Policies Through This Forest Land Planning Process?” the sustainable harvest level for state trust lands in the OESF is a policy-level decision that will be reached through a separate planning process.

However, the harvest schedules analyzed in this RDEIS for both alternatives represent a harvest level that is higher than the current sustainable harvest level of 576 million board feet per decade. When DNR modeled the two alternatives for this environmental analysis, DNR did not constrain the model to any pre-determined harvest level. DNR made this decision for the following reasons:

- A primary purpose of forest land planning is to determine if the sustainable harvest level can be met. An effective way to answer this question is to run the model without a harvest level constraint, and then compare the resulting harvest level to the current sustainable harvest level.
- DNR is near the end of the current sustainable harvest decade and the new sustainable harvest level has not been calculated. To impose the current sustainable harvest level on the model would require DNR to assume that the level will not change; to impose a lower or higher level on the model would require DNR to speculate on what a future level might be. DNR believes both of these options to be speculative and inappropriate.
- By running the model without a harvest level constraint, DNR was able to determine the harvest schedule that would result from applying the management strategies and procedures unique to each alternative. Had the model been constrained to the current sustainable harvest level, the harvest schedule would have been very similar, which would have masked the true differences between the alternatives.

Regardless of which alternative is chosen in this planning process, the sustainable harvest level for the OESF will remain at 576 million board feet for the current decade.

Potential Environmental Impacts and Mitigation

In Chapter 3 of this RDEIS, DNR analyzes the potential environmental impacts of the two alternatives on the forest as a whole and on elements of the environment such as wildlife or water quality. According to DNR’s analysis, potential environmental impacts for most indicators are low or medium. In fact, some low impacts represent a general *improvement* in conditions. Over the 100-year analysis period, DNR anticipates:

- An **increase in the number of acres of state trust lands in the Structurally Complex stand development stage**. DNR considers an increase in structural complexity a benefit to wildlife (refer to “Wildlife,” p. 3-187). Developing and maintaining

structural complexity in managed stands is important to any forest management program that intends to maintain forest biodiversity and ecosystem processes (Lindenmayer and Franklin 2002).



- **A decrease in the number of acres in the Competitive Exclusion stage.** No wildlife species in Western Washington are found exclusively in the Competitive Exclusion stand development stage (Carey and Johnson 1995) because of its low structural diversity and low or absent shrub cover (Johnson and O’Neil 2001).
- **A reduction in the number of acres of state trust lands considered to be in a high forest health risk category due to overstocking (too many trees).** Although not universally true, trees with less room to grow are less able to withstand attack from insects, pathogens, and parasites (Safranyik and others 1998).
- **A gradual improvement in riparian conditions,** as demonstrated by improvements in the composite watershed scores. The composite watershed score assesses the health of the riparian system as a whole.
- **An increase in the number of acres of modelled northern spotted owl habitat.** (DNR refers to habitat as “modeled” to emphasize that the current conditions and results of this analysis are based on the outputs of DNR’s forest estate model.)

Potential high impacts are identified for only a few indicators. Most of these impacts are related to the potential delivery of fine sediment from the road network (potential road failure, road density, proximity of roads to streams, and fine sediment delivery from the road network to certain types of fish habitat). **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.**

In this RDEIS analysis, DNR identified only one potential significant adverse impact. DNR’s analysis found that more than 10 percent of essential coho salmon winter rearing habitat is projected to remain in a high impact condition for large woody debris recruitment during most decades of the analysis period. This impact will not be mitigated through current management practices. However, DNR has identified possible mitigation; refer to “Mitigation,” later in this summary for more information.

Following is a summary of the analysis results for each topic. As a reminder, for this analysis, only potential high impacts are considered potentially significant impacts. Refer to Chapter 3 of the RDEIS for the full analysis.

Forest Conditions and Management

This topic is an overview of the potential environmental impacts of harvest activities on the sustainability, biodiversity, and the health of the forest itself. Table ES-2 shows the potential environmental impacts of the alternatives on forest conditions and management, by indicator.

Table ES-2. Potential Environmental Impacts on Forest Conditions by Indicator and Alternative

Criteria	Indicators	No Action Alternative	Landscape Alternative
Forest sustainability	Forest biomass	Low ●	Low ●
	Harvest methods and number of forest stand entries	Low ●	Medium ◆
Forest structural complexity	Stand development stages	Low ●	Low ●
Forest health	Stand density	Low ●	Low ●

● Low impact ◆ Medium impact

Potential environmental impacts are considered medium or low for all indicators. **DNR has not identified probable significant adverse environmental impacts on forest conditions from either alternative for any indicator for this topic.**

Riparian

Riparian areas are where aquatic and terrestrial ecosystems interact. They include surface waters such as rivers, streams, lakes, ponds, and wetlands, and adjacent forests and ground-water zones. “Riparian” examines riparian areas using the criterion functioning riparian habitat. Functioning riparian habitat is “habitat that is capable of supporting viable populations of salmonid species as well as for other non-listed and candidate species that depend on healthy in-stream and riparian environments” (DNR 1997, p. IV.107). Table ES-3 shows the potential environmental impacts of the alternatives on riparian areas, by indicator.

Table ES-3. Potential Environmental Impacts on Riparian Areas by Indicator and Alternative

Criterion	Indicators	No Action Alternative	Landscape Alternative
Functioning riparian habitat	Large woody debris recruitment	Medium ◆	Medium ◆
	Peak flow	Low ●	Low ●
	Stream shade	Low ●	Low ●
	Fine sediment delivery	Low ●	Low ●
	Leaf and needle litter recruitment	High ■	High ■
	Riparian microclimate	Medium ◆	Medium ◆
	Composite watershed score	Medium ◆	Medium ◆

● Low impact ◆ Medium impact ■ High impact

Potential environmental impacts are rated medium or low for all indicators except one: leaf and needle litter recruitment. For this indicator, DNR considers impacts to be probable and adverse but not significant because this indicator’s contribution to riparian function is relatively minor: it is only 5 percent of the composite watershed score. Therefore, **DNR has not identified probable significant adverse environmental impacts on riparian areas from either alternative for any indicator for this topic.**

Soils

Since soil is the basis of plant growth, soil conservation is vital to maintaining functioning and productive forest ecosystems. Table ES-4 shows the potential environmental impacts of the alternatives on soils, by indicator.

Table ES-4. Potential Environmental Impacts on Soils by Indicator and Alternative

Criterion	Indicators	No Action Alternative	Landscape Alternative
Soil conservation	Soil compaction	Low ●	Low ●
	Soil erosion	Low ●	Low ●
	Soil displacement	Medium ◆	Medium ◆
	Soil productivity	Low ●	Low ●
	Landslide potential	Low ●	Low ●
	Potential road failure	High ■	High ■











● Low impact ◆ Medium impact ■ High impact

Potential environmental impacts are rated medium or low for all indicators except one: potential road failure. Should it occur, the potential impact of a road failure could be adverse. However, potential road failure is expected to be mitigated to a level of non-significance through current management practices (implementation of projects identified in road maintenance and abandonment plans and ongoing inspection, maintenance, and repair of roads). Therefore, **DNR has not identified probable significant adverse environmental impacts on soils from either alternative for any indicator for this topic.** Refer to “Mitigation” later in this summary for more information.

Water Quality

Water quality is fundamental to the health of riparian areas. Riparian areas support native fish populations and other aquatic species as well as the birds and mammals that depend on those areas for all or part of their life cycles. Table ES-5 shows the potential environmental impacts of the alternatives on water quality, by indicator.

Table ES-5. Potential Environmental Impacts on Water Quality by Indicator and Alternative

Criteria	Indicator	No Action Alternative	Landscape Alternative
Adherence to water quality standards	Stream shade (surrogate for stream temperature and dissolved oxygen)	Medium 	Medium 
	Road density (surrogate for turbidity ^a)	High 	High 
	Stream crossing density (surrogate for turbidity ^a)	Low 	Low 
	Proximity of roads to streams or other water bodies (surrogate for turbidity ^a)	High 	High 
	Traffic use (surrogate for turbidity ^a)	Medium 	Medium 

 Low impact  Medium impact  High impact

^aEcology uses stream temperature, dissolved oxygen, and turbidity as indicators to monitor water quality. DNR uses surrogates to evaluate these indicators.

Potential environmental impacts are considered medium or low for all indicators except two: road density and proximity of roads to streams or other water bodies. Roads can potentially deliver fine sediment to streams unless they have been abandoned, and fine sediment delivery to streams is considered an adverse impact. However, potential fine sediment delivery from the road network is expected to be mitigated to a level of non-significance through current management practices (implementation of projects identified in road maintenance and abandonment plans; ongoing inspection, maintenance, and repair of roads; and suspension of timber hauling during storm events). Therefore, **DNR has not identified probable significant adverse environmental impacts on water quality from either alternative for any indicator for this topic.** Refer to “Mitigation” in this summary for more information.

Fish

Fish have ecological, economic, and cultural significance in Washington. For this analysis, DNR identifies stream reaches on state trust lands that are essential habitat for five species of salmonids: **Chinook, coho, and Lake Ozette sockeye salmon and steelhead and bull trout.** DNR then analyzes impacts to that habitat using four indicators of riparian function (large woody debris recruitment, peak flow, stream shade, and fine sediment delivery). Table ES-6 shows the potential environmental impacts of the alternatives on essential fish habitat, by indicator.

Table ES-6. Potential Environmental Impacts on Fish by Indicator and Alternative

Criteria	Indicators	No Action Alternative	Landscape Alternative
Chinook salmon spawning			
Functioning riparian habitat	Large woody debris recruitment	Medium	Medium
	Peak flow	Low	Low
	Stream shade	Medium	Medium
	Fine sediment delivery	High	High
Coho salmon summer rearing			
Functioning riparian habitat	Large woody debris recruitment	Medium	Medium
	Peak flow	Low	Low
	Stream shade	Low	Low
	Fine sediment delivery	Low	Low
Coho salmon winter rearing			
Functioning riparian habitat	Large woody debris recruitment	High	High
	Peak flow	Low	Low
	Stream shade	Low	Low
	Fine sediment delivery	High	High
Steelhead trout rearing			
Functioning riparian habitat	Large woody debris recruitment	Low	Low
	Peak flow	Low	Low
	Stream shade	Medium	Medium
	Fine sediment delivery	High	High
Bull trout			
Functioning riparian habitat	Large woody debris recruitment	Medium	Medium
	Peak flow	Low	Low
	Stream shade	Medium	Medium
	Fine sediment delivery	High	High
Lake Ozette sockeye salmon			
Functioning riparian habitat	Large woody debris recruitment	Low	Low
	Peak flow	Low	Low
	Stream shade	Low	Low
	Fine sediment delivery	High	High

Low impact Medium impact High impact

Potential environmental impacts are considered medium or low for all indicators except two: fine sediment delivery for all habitat types except coho salmon summer rearing, and large woody debris recruitment for coho winter rearing habitat.

Fine sediment is derived primarily from the erosion of road surfaces over time. Fine sediment delivery to streams is considered an adverse impact; however, potential fine sediment delivery from the road network will be mitigated to a level of non-significance through current management practices (implementation of projects identified in road maintenance and abandonment plans; ongoing inspection, maintenance, and repair of

roads; and suspension of timber hauling during storm events). Therefore, **DNR has not identified probable significant adverse environmental impacts from either alternative for fine sediment delivery.**

DNR has identified **probable significant adverse impacts for large woody debris recruitment for coho salmon winter rearing habitat.** Possible mitigation is proposed for this indicator. Refer to “Mitigation” later in this summary for more information.

Wildlife

Wildlife habitat is defined as the combination of resources (food, water, cover) and environment (climate, soils, vegetation structure) that attracts and supports a species, population, or group of species (Johnson and O’Neil 2001). In this section of the RDEIS, DNR considers how each of the alternatives will impact the ability of state trust lands in the OESF *as a whole* to support wildlife. For that reason, the analysis in this section focuses on the habitat needs of a broad range of wildlife species rather than the needs of specific species, and emphasizes potential environmental impacts at the largest spatial scale (all state trust lands in the OESF) instead of smaller scales such as landscapes or watershed administrative units.

The potential environmental impacts of the alternatives on northern spotted owls are analyzed in a separate section of this RDEIS because they are listed as threatened under the Endangered Species Act. Also, DNR is updating its current management strategy and associated procedure for northern spotted owls as part of this proposed action. For the management strategy, refer to Appendix A. For the procedure, refer to Appendix F.

DNR did not include, in this RDEIS, a separate section for the potential environmental impacts of the alternatives on marbled murrelets. Although marbled murrelets are also listed as threatened under the Endangered Species Act, DNR is currently developing the long-term Marbled Murrelet Conservation Strategy in a separate planning process. Instead, DNR includes marbled murrelets in the general discussion on wildlife habitat. Table E-7 shows the potential environmental impacts of the alternatives on wildlife, by indicator.

Table ES-7. Potential Environmental Impacts on Wildlife by Indicator and Alternative

Criteria	Indicators	No Action Alternative	Landscape Alternative
Conservation of biodiversity	Stand development stages supporting wildlife guilds	Low ●	Low ●
	Interior older forest	Medium ◆	Medium ◆

● Low impact ◆ Medium impact

Potential environmental impacts are considered medium or low for all indicators. **DNR has not identified probable significant adverse environmental impacts on wildlife from either alternative for any indicator for this topic.**

Northern Spotted Owls

For this analysis, DNR considers the potential impacts of the two alternatives on northern spotted owls, a species that was federally listed in 1990 as threatened under the Endangered Species Act. DNR contributes to federal northern spotted owl recovery objectives by providing habitat on state trust lands in the OESF that makes a significant contribution to demographic support, maintenance of species distribution, and facilitation of dispersal.¹³ Table ES-8 shows the potential environmental impacts of the alternatives on northern spotted owls, by indicator.

Table ES-8. Potential Environmental Impacts on Northern Spotted Owls by Indicator and Alternative

Criteria	Indicators	No Action Alternative	Landscape Alternative
Amount of habitat capable of providing support for the recovery of the Olympic Peninsula sub-population of northern spotted owls	Number of acres of modeled northern spotted owl habitat	Low ●	Low ●
	Number of acres supporting northern spotted owl life history requirements	Low ●	Low ●
	Number of viable northern spotted owl territories	Low ●	Low ●

● Low impact

Potential environmental impacts are considered low for all indicators. The capability of state trust lands to provide support for the recovery of the Olympic Peninsula sub-population of northern spotted owls is expected to increase, as predicted in the 1997 *Habitat Conservation Plan*. DNR has not identified probable significant adverse environmental impacts on wildlife from either alternative for any indicator for this topic.

Climate Change

Climate change is a change in average temperature and weather patterns that occurs on a regional or global scale over decades to centuries. Climate change is closely linked to a global rise in temperature, which is closely linked to the amount of carbon dioxide in the atmosphere. In this section, DNR examines carbon sequestration (storage) in forest stands on state trust lands in the OESF and compares it to carbon emissions from wood harvested from state trust lands in the OESF. Table ES-9 shows the potential environmental impacts of the alternatives on climate change, by indicator.

Table ES-9. Potential Environmental Impacts for Climate Change by Indicator and Alternative

Criteria	Indicators	No Action Alternative	Landscape Alternative
Carbon sequestration	Amount of carbon sequestered in forest stands	Low ●	Low ●
	Difference between amount of carbon sequestered and emitted	Low ●	Low ●

● Low impact

Potential environmental impacts are considered low for all indicators. The amount of carbon sequestered in forest stands on state trust lands in the OESF is expected not only to increase, but to far exceed the amount of carbon released. **DNR has not identified probable significant adverse environmental impacts on climate change from either alternative for any indicator for this topic.**

Mitigation

Mitigation Through Current Management Practices

Following, DNR describes current management practices (established programs, rules, procedures, or other practices) that are expected to mitigate potential high impacts to a level of non-significance. This mitigation applies to the following indicators: road density, proximity of roads to streams or other water bodies, road failure, and fine sediment delivery (all fish habitat types except coho salmon summer rearing). All of these indicators are related to the road network.

ROAD MAINTENANCE AND ABANDONMENT PLANS

The forest practices rules contain specific direction for constructing and maintaining roads (WAC 222-24) to protect water quality and riparian habitat. Specifically, road construction and maintenance must prevent or limit actual or potential delivery of sediment and surface water to any typed water where it would prevent the achievement of fish habitat or water quality goals.

The forest practices rules require large forest landowners,¹⁴ such as DNR, to prepare road maintenance and abandonment plans for all roads that have been used or constructed since 1974.¹⁵ These plans specify the steps that will be taken to either abandon roads or bring roads that do not meet current standards into compliance. Consistent with the forest practices rules, DNR has developed road maintenance and abandonment plans for roads on state trust lands in each of the 11 landscapes in the OESF.

Road traffic generates sediment through surface erosion, and the key to controlling sediment is controlling erosion. Erosion control measures are necessary if exposed soils can deliver sediment to streams. DNR’s objective for roads is to create a stable, dispersed, non-erosive drainage pattern associated with road surface runoff to minimize potential or actual sediment delivery to streams. Depending on what is appropriate for site-specific

conditions, this objective can be accomplished in a variety of ways, such as using ditches, culverts, and other structures to collect sediment-laden water runoff from the road and direct it to areas on the forest floor where it can be captured or safely dissipated away from the stream; stabilizing ditch walls; or constructing catch basins to capture water runoff and allow sediment to settle out of the water.

Work under these plans is ongoing. Table ES-10 shows the number of projects completed under road maintenance and abandonment plans for roads on state trust lands in each of the 11 landscapes in the OESF. Work associated with these plans must be completed by October 31, 2016.

Table ES-10. Percentage of Projects Identified in Road Maintenance and Abandonment Plans Completed by Year End 2012

Landscape	Number of projects completed by end of 2012	Total number of projects identified in plan	Percent completed
Clallam	187	252	74%
Clearwater	147	309	48%
Coppermine	150	302	50%
Dickodohtedar	423	789	54%
Goodman	239	361	66%
Kalaloch	184	227	81%
Queets	216	271	80%
Reade Hill	67	76	88%
Sekiu	89	360	25%
Sol Duc	104	107	97%
Willy Huel	246	272	90%

All work completed under these plans is performed using (as appropriate) the best management practices for road construction and maintenance described in the Forest Practices Board Manual (DNR 2013) and the guidance provided in DNR’s Forest Roads Guidebook (DNR 2011). DNR continually updates and prioritizes these plans to address newly identified environmental impacts from the existing road network.

Effectiveness of Road Maintenance and Abandonment Plans

The correct implementation of current forest practices rules for road maintenance is expected to minimize runoff water and sediment delivery to typed waters (DNR 2013). A statewide study conducted on private forestlands in Washington found that road maintenance and abandonment appear to reduce the amount of road-related sediment that reaches streams (Martin 2009). This study found that implementing best management practices decreased the number of road miles hydrologically connected to streams, and that most roads studied had a low probability of delivering sediment to streams (Martin 2009). In addition, the monitoring of the effectiveness of road maintenance and abandonment plans that was conducted statewide by Dubé and others (2010) from 2006 through 2008 found that as roads were brought up to modern standards, they showed decreased sediment delivery to streams.

INSPECTION, MAINTENANCE, AND REPAIR

After work identified under road maintenance and abandonment plans has been completed in 2016, DNR will continue to inspect, maintain, and repair roads and bridges as needed using the appropriate best management practices for road maintenance and repair identified in the current Forest Practices Board Manual and the guidance in the Forest Roads Guidebook. Routine maintenance of road dips and surfaces and quick response to problems can significantly reduce road-caused slumps and slides and prevent the creation of berms that could channelize runoff (Environmental Protection Agency 2012).

SUSPENSION OF TIMBER HAULING DURING STORM EVENTS

In addition to road maintenance and abandonment plans, DNR also considers how operations can be adjusted to further prevent delivery of fine sediment to streams. For example, 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. 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. If timber hauling is suspended, DNR monitors the road to determine if problems are developing that may lead to sediment delivery to streams and takes action as necessary.

Possible Mitigation

Following, DNR describes possible mitigation for the indicator large woody debris recruitment for coho salmon winter rearing habitat. This possible mitigation may be implemented along stream reaches of essential coho salmon winter rearing habitat where DNR has identified potential high impacts for large woody debris recruitment. Possible mitigation may reduce potential high impacts for large woody debris recruitment in this habitat type to a lower level. As described in the introduction to this chapter, possible mitigation is something DNR may or may not implement. Although DNR may adopt possible mitigation in the future, DNR is not committed to implementing it at this time.

- Thin riparian forests that are currently in the Competitive Exclusion stand development stage to accelerate tree growth, thereby decreasing the time until large woody debris is available to the stream.
- In riparian forests dominated by deciduous trees (typically red alder), use silviculture to convert the stand to conifer dominance. The restoration goal would be to encourage the development of a forest containing large-diameter conifers. Red alder-dominated riparian forests are likely the result of past forestry practices. If left untreated, many red-alder dominated stands may be replaced by salmonberry (a type of shrub), rather than conifers (Hibbs and Giodano 1996 as cited in Bigley and Deisenhofer 2006).
- Perform riparian enhancement activities, such as felling a limited number of trees from the riparian forest into the stream channel to augment in-stream large woody debris. Such efforts could be funded and implemented jointly with external parties.

Cumulative Impacts and Uncertainties

Cumulative Impacts

For cumulative impacts, DNR considers the potential environmental impacts of DNR's alternatives in context with impacts from past, present, and reasonably foreseeable future activities on lands in the OESF managed by other landowners (federal and private). Based on this analysis, DNR anticipates the following for the 100-year analysis period.

- **Federal landowners** manage 39 percent of the OESF. NPS manages Olympic National Park primarily to maintain natural ecosystems and processes; USFS manages Olympic National Forest to maintain or enhance habitat for late successional and old-growth forest related species, and to protect and enhance watershed and aquatic habitat conditions. Conditions on federal lands are expected to continue improving.
- **DNR** manages 21 percent of the OESF for both revenue production and ecological values through an integrated management approach. As the environmental analysis contained in this RDEIS demonstrates, over the 100-year analysis period, DNR anticipates a general improvement in conditions.
- **Private landowners**, including timber companies, manage 30 percent of the OESF according to the forest practices rules. Environmental conditions on private lands are generally expected to improve.

DNR anticipates that conditions across ownerships will continue improving over the 100-year analysis period. Implementation of the forest land plan for the OESF is expected to further improve this trend: as DNR implements integrated management, DNR will gather information on the effectiveness of its management practices through its research and monitoring program. This information will be considered for possible future management changes through the adaptive management process. Together, research and monitoring and adaptive management should lead to more effective management in the future.

Uncertainties

Uncertainties are presented in Chapter 4 of the RDEIS. Although uncertainties exist in this analysis, DNR believes that the information provided in the RDEIS is sufficient to evaluate the potential environmental impacts of the two alternatives. All analysis has been performed using the best available scientific information and techniques.¹⁶

Some of these uncertainties may be addressed through DNR's proposed research and monitoring program and adaptive management process (refer to Appendix A [draft forest land plan], Chapter 4). Uncertainties will be prioritized and selected for research and monitoring based on predefined criteria.

Endnotes

1. http://www.dnr.wa.gov/ResearchScience/Topics/TrustLandsHCP/Pages/lm_hcp_trust_land_report.aspx
2. http://www.dnr.wa.gov/ResearchScience/Topics/StateTrustLandsForestManagement/Pages/policy_for_sustainable_forests.aspx
3. With the exception of natural area preserves and natural resource conservation areas, deferrals may be released for harvest in the future due to a change in policy, new scientific information on the integration of revenue production and ecological values, a change in forest conditions, or other factors. Should that occur, DNR will perform additional environmental analysis to assess the potential impacts of harvesting these areas.
4. Adaptive management is referred to as “systematic application of knowledge gained” in the 1997 *Habitat Conservation Plan*.
5. For planning and management, the OESF has been divided into 11 administrative areas called landscapes.
6. Site-specific evaluations allow DNR to reconsider all information, make any relevant changes based on localized conditions, and consider mitigation, if appropriate.
7. A precommercial thinning is done to concentrate growth on the more desirable trees. This type of thinning does not generate revenue; trees that are thinned are neither removed from the site nor sold.
8. Operations that have been determined to have no direct potential for damaging a public resource (WAC 222-16-050).
9. Refer to State Trust Lands map (http://www.dnr.wa.gov/Publications/eng_rms_trustlands_map_nu2.pdf) for lands held in trust to support specific beneficiaries.
10. Natural resources conservation areas often include significant native ecosystems and geologic features, archaeological resources, or scenic attributes. Natural area preserves protect the highest quality native ecosystems and generally host more sensitive or rare species.
11. Under the forest practices rules (WAC 222-24-52(3)), a road is considered abandoned if: (a) roads are outsloped, water barred, or otherwise left in a condition suitable to control erosion and maintain water movement within wetlands and natural drainages; (b) ditches are left in a suitable condition to reduce erosion; (c) the road is blocked so that four-wheel highway vehicles cannot pass the point of closure at the time of abandonment; (d) water crossing structures and fills on all typed waters are removed, except where the department determines other measures would provide adequate protection to public resources; and (e) DNR has determined that the road is abandoned.
12. A variable density thinning is a thinning in which some areas are lightly thinned (“skips”) and other areas are more heavily thinned (“gaps”) to create variations in stand density and canopy cover (Lindenmayer and Franklin 2002). A variable retention harvest is a type of stand replacement harvest in which leave trees (trees that are not harvested), snags, large logs, and other structural features are retained between one harvest and the next to provide structural diversity.
13. Demographic support refers to the contribution of individual territorial spotted owls or clusters of spotted owl sites to the stability and viability of the entire population (Hanson and others 1993). Maintenance of species distribution refers to supporting the continued presence of the northern spotted owl populations in as much of its historic range as possible (Thomas and others 1990; USFWS 1992). Dispersal refers to the movement of juvenile, sub-adult, and adult animals (northern spotted owls) from one sub-population to another. For juvenile northern spotted owls, dispersal is the process of leaving the natal (birth) territory to establish a new territory (Forsman and others 2002; Miller and others 1997; Thomas and others 1990).
14. In Washington, large forest landowners are those who harvest an annual average of more than 2 million board feet of timber from their own forestland in the state.
15. Older roads that have not been used since 1974 are considered “orphaned.”
16. For a definition of “best available science,” refer to WAC 365-195-905.