



Chapter

2

Proposed Action and Alternatives

■ In This Chapter

Proposed action

Alternatives

Alternatives considered but
eliminated

Elements considered but not
analyzed

Proposed Action and Alternatives



This chapter describes the proposed action and DNR's proposed alternatives. This chapter also discusses the alternatives considered but eliminated from detailed study, and describes the elements of the environment considered but not analyzed in this RDEIS.

Proposed Action

As stated in Chapter 1, DNR's proposed action is to develop and implement a forest land plan for the management of state trust lands in the OESF. The proposed action includes the related tasks of updating existing procedures as needed and developing a new procedure for salvage of timber after natural disturbance events such as wind and fire.

What Is a Forest Land Plan?

A forest land plan is a document that defines, for a given planning area such as the OESF, *what* DNR wishes to achieve and *how* it will achieve it. Forest land plans are often undertaken to balance multiple objectives such as revenue production and ecological values, as will be discussed later in this chapter.

What Is the Purpose of the Proposed Action?

As stated in Chapter 1, the proposed forest land plan for state trust lands in the OESF will be based

on current DNR policies including the 1997 *Habitat Conservation Plan* and 2006 *Policy for Sustainable Forests* as well as all applicable local, state, and federal laws. 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 include objectives that DNR must meet (refer to Text Box 2-1). 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.** DNR’s management approach to state trust lands in the OESF is integrated management, which will be described later in this chapter.

The proposed forest land plan will be written for DNR foresters and managers. It will include DNR’s management approach, the objectives that DNR must meet, the management strategies that will be used to meet those objectives, 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 chapter. To help the reader understand what a forest land plan is, DNR has developed a draft plan based on the Landscape Alternative (refer to Appendix A).

Why Does DNR Need to Develop a Forest Land Plan?

As stated in Chapter 1, 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

Text Box 2-1. Definition of Management Terms, Part 1

	<p>Management approach</p> <p>A broad framework for how an area will be managed. Setting aside one area for timber harvest and another for ecological values is one example of a management approach. Another example is integrated management.</p>
	<p>Conservation strategy</p> <p>Describes how to manage types of wildlife habitat, such as riparian or northern spotted owl habitat. Conservation strategies include objectives and direction on meeting those objectives. DNR’s conservation strategies are presented in the 1997 <i>Habitat Conservation Plan</i>.</p>
	<p>Management strategy</p> <p>The specific steps that will be taken to implement each component of a conservation strategy or other policy. An example of a management strategy for implementing the multispecies conservation strategy is to protect balds, talus slopes, caves, or other unique habitat features. Writing management strategies is part of developing a forest land plan.</p>
	<p>Procedure</p> <p>Instructions for foresters completing tasks in the field. For example, a procedure may describe how to identify balds or talus slopes and how to conduct management activities around them. Procedures are often written to implement management strategies.</p>

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 “[i]n 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).

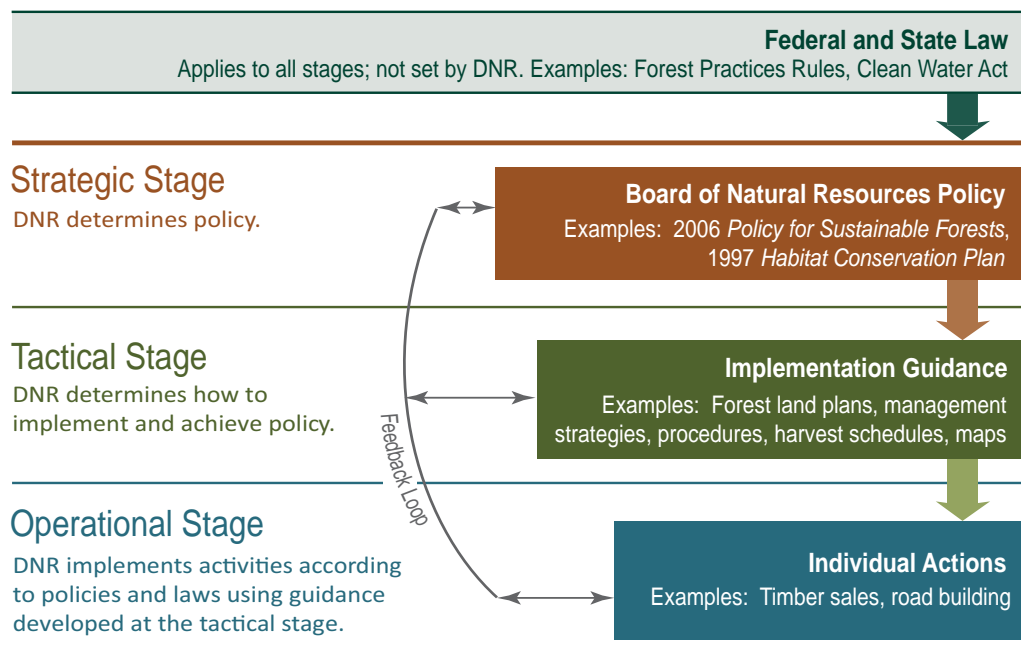
Can DNR Change its Policies Through This Proposed Action?

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.

DNR’s planning process has three stages: strategic, tactical, and operational (Figure 2-1).

- 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 this stage of planning, DNR develops forest land plans, management strategies, procedures, maps, models, databases, and other guidance.

Figure 2-1. DNR’s Planning Process





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 provided 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.

SEPA 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 at the operational stage, if required, as they are proposed.¹ 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 thinning² and tree planting are Class I Forest Practices³ 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 100-year period used for this analysis. In other words, DNR did not analyze future policy changes in this RDEIS because it is not possible to predict what those changes would be.

DNR’s Management Approach and Objectives

This section describes the management approach that DNR will use for state trust lands in the OESF and the management objectives that DNR must meet. The forest land plan must implement this management approach and enable DNR to meet these objectives.

DNR's Management Approach: Integrated Management

DNR manages state trust lands in the OESF for revenue production (primarily through the harvesting of trees) and ecological values (refer to Text Box 2-2) through an approach DNR refers to as *integrated management*. Integrated management is an experimental management approach based on the principle that a forested area can be managed to provide both revenue production and ecological values (such as biodiversity) across its width and breadth.

The integrated management approach differs from the more common approach of dividing a forested area 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.

Text Box 2-2. 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.

THE ROLE OF ACTIVE MANAGEMENT

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 2-3). Each of these "human-influenced disturbance" activities is designed to encourage the development, through natural growth processes, of conditions that support revenue production and ecological values. For example, to support biodiversity (an ecological value), DNR uses harvest methods that promote structural complexity within and across forest stands. Examples of structural

Text Box 2-3. Definitions of Management Terms, Part 2

- **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.

complexity include snags (standing dead trees), down wood, multiple canopy layers, forest openings, and a range of forest stand development stages (refer to “Forest Conditions and Management” for a description of harvest methods (p. 3-22) and stand development stages (p. 3-25).

ALL AREAS DO NOT CONTRIBUTE EQUALLY

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. Instead, DNR actively manages state trust lands in the OESF *to the maximum extent possible* (DNR 2006).

Some areas, due to their physical characteristics or their importance to ecological values (or both), provide limited support for revenue production. For example, riparian management zones, which are designated along streams, are managed primarily for ecological values according to the riparian conservation strategy (riparian management zones and the activities allowed within them will be discussed under “DNR’s Management Objectives” in this chapter).

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 (refer to “Deferrals May Change” later in this section). For example, some forest stands are deferred per the 2006 *Policy for Sustainable Forests*; an example is old-growth stands.⁴ In another example, potentially unstable slopes are currently deferred to reduce the risk of landslides. Deferrals currently account for 40 percent, or 107,320 acres, of state trust lands in the OESF. An additional 3,512 acres in the OESF are designated permanently as natural area preserves and natural resources conservation areas, which are not considered state trust lands and cannot be harvested but which contribute to the objectives of DNR’s conservation strategies (refer to Table 2-1). Together, these areas account for 43 percent of DNR-managed lands in OESF. The remaining 57 percent (146,734 acres) is considered operable, or available for harvest according to current policies and laws.

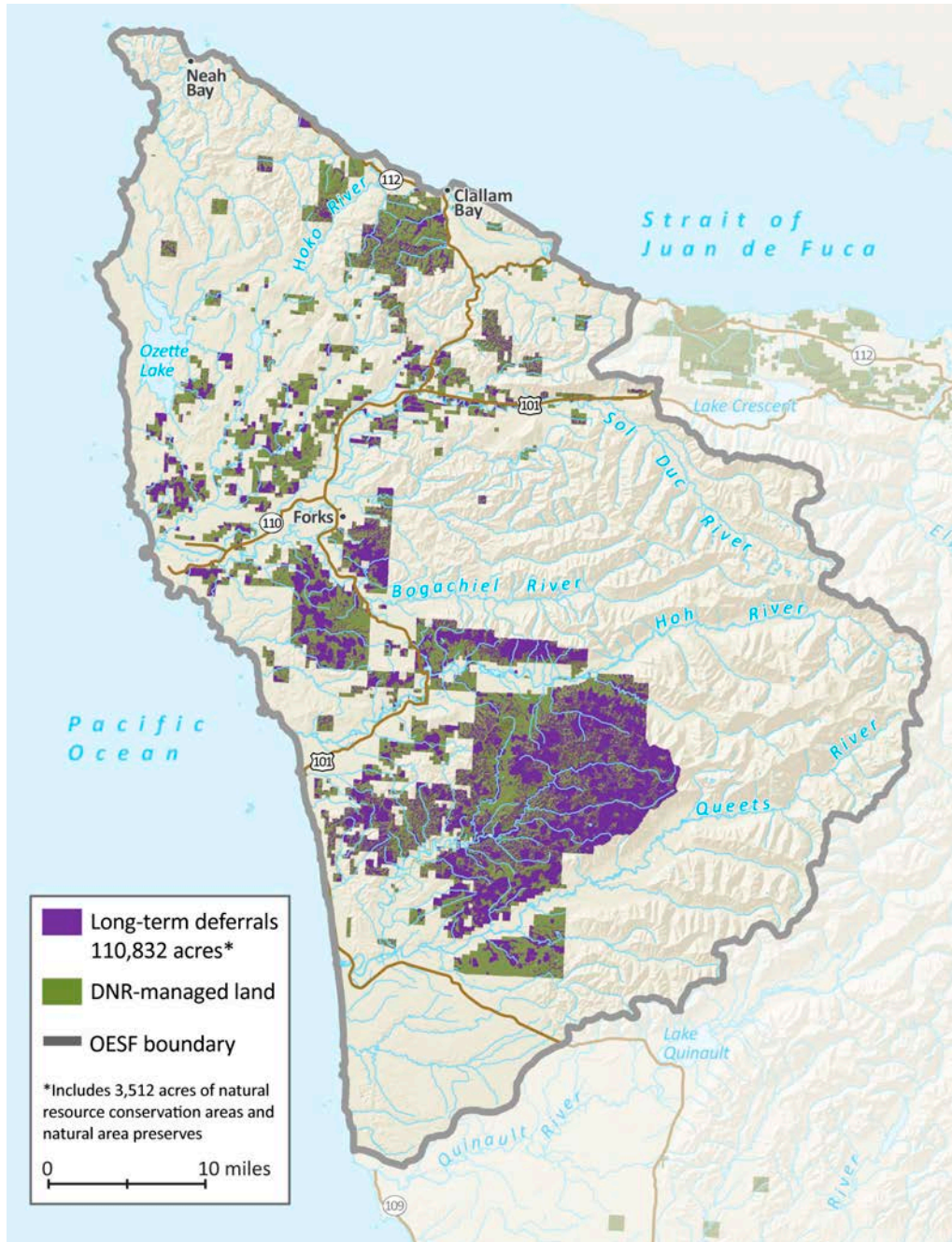
What makes the integrated management approach unique is that deferrals, riparian management zones, and other areas that primarily support ecological values are **interspersed**

Table 2-1. Natural Resources Conservation Areas and Natural Area Preserves in the OESF

Name	Acres	Features
South Nolan Natural Resource Conservation Area	213	Old-growth coastal forest, forested sphagnum bog, and low elevation sphagnum bog
Clearwater Corridor Natural Resource Conservation Area	2,323	Mature coastal forest, aquatic-riparian habitat
Shipwreck Point Natural Resource Conservation Area	472	Puget Sound beach, stream and riparian habitat, and coastal forest
Clearwater Bogs Natural Area Preserve	504	Forested sphagnum bog, low elevation sphagnum bog
TOTAL	3,512	

with more actively managed areas, not consolidated in large blocks (refer to Map 2-1). Through active management and deferrals, DNR promotes the development of a diverse, complex forest ecosystem in which areas that provide more support for revenue production and those that provide more support for ecological values complement each other. **The successful outcome of integrated management should be a functioning, healthy, productive forest ecosystem that encompasses conditions ranging from young stands to mature, structurally complex stands, providing quality timber for harvest and habitat for native species across state trust lands in the OESF.**

Map 2-1. Harvest Deferrals on State Trust Lands in the OESF



Deferrals May Change

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.

In addition, DNR may conduct limited management activities on deferrals as long as such activities are consistent with current DNR policy. For example, DNR may build short segments of roadway through a deferral. The potential environmental impact of these activities will be evaluated on a site-specific basis at the time they are proposed.

DNR assumes that areas currently deferred from harvest will remain deferred for the entire 100-year analysis period used for this RDEIS, and that no management will occur within these areas. It is not possible to predict when or if these areas will be released for harvest, or what management activities may be necessary in these areas in the future.

FINDING BALANCED MANAGEMENT SOLUTIONS

The challenges of the integrated management approach are to a) understand the contribution different areas can make toward supporting 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, or natural disturbances, their contributions to supporting revenue production and ecological values change also. Such changes must be factored into planning and management.

The challenges of integrated management are met through tools such as maps and databases (No Action Alternative) or a forest estate model,⁵ and planning from a landscape perspective (Landscape Alternative). Later in this chapter, DNR will describe the ways in which integrated management will be implemented under either alternative. DNR will also describe the forest estate model.

MANAGEMENT WILL EVOLVE

Integrated management is both a long-term vision and an experimental approach that is expected to evolve over time. As DNR implements integrated management, it will intentionally 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. The 1997 *Habitat Conservation Plan* requires three types of monitoring: implementation monitoring, used to determine whether conservation strategies are implemented as written; effectiveness monitoring, used to determine whether the implementation of the conservation strategies results in anticipated habitat conditions; and validation monitoring, used to evaluate the cause-and-effect relationships between the habitat conditions that result from the implementation of conservation strategies and the wildlife species the strategies are intended to benefit (DNR 1997, p. V.1).

Information gathered through operational experience, research, and monitoring will be applied to future management through the **adaptive management process**.⁶ Changes proposed under adaptive management may range from small adjustments to DNR’s procedures to recommendations for a change in policy. Changes to policy, such as altering the objectives of a conservation strategy, would require approval by the Board and consultation with the United States Fish and Wildlife Service (USFWS) and NOAA Fisheries (USFWS and NOAA Fisheries are collectively referred to as the Federal Services) and may also require additional environmental analysis and an update to the forest land plan (refer to “What if DNR Policies Change During Plan Implementation?” in this chapter).

Changes to procedures and management strategies are not considered policy and would not require Board approval. Such changes are expected; in an experimental forest, management strategies and procedures are meant to be tested and altered as needed. **The flexibility to change management in response to new information is central to the concept of an experimental forest.**

DNR will examine any proposed change to its management of state trust lands in the OESF to determine if that change falls within the range of impacts analyzed in this RDEIS. If it does not, additional environmental analysis under SEPA may be required. For a full description of DNR’s research and monitoring program and adaptive management process, refer to Appendix A (draft forest land plan), Chapter 4.

DNR’s Management Objectives

DNR’s objectives for managing state trust lands in the OESF are based on the 1997 *Habitat Conservation Plan* and the 2006 *Policy for Sustainable Forests*. As stated previously, **the forest land plan, and the final selected alternative on which it is based, must enable DNR to meet these objectives.** All objectives must be achieved in the context of integrated management.

REVENUE

Objective: 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 in 2007. By harvesting timber, DNR provides revenue to its trust beneficiaries to meet its fiduciary obligations (DNR 2006, p. 9 through 16).

RIPARIAN HABITAT

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).

To achieve the overall objective of the riparian conservation strategy, DNR developed four measurable objectives through careful study and interpretation of the 1997 *Habitat Conservation Plan*. These measurable objectives are as follows:

- Maintain or aid restoration of the riparian forest’s potential to provide **large woody debris** to the stream channel. Large woody debris recruitment refers to logs, pieces of logs, root wads, or large chunks of wood falling into stream channels. Large woody debris is an important habitat component for fish and other aquatic organisms (Swanson and others 1976, Harmon and others 1986, Bisson and others 1987, Maser and others 1988, Naiman and others 1992, Samuelsson and others 1994).
- Maintain or aid restoration of the riparian forest’s potential to provide **shade** to the stream channel. Stream shade refers to the extent to which incoming sunlight is blocked on its way to the stream channel. Stream shade is considered one of the primary factors influencing stream temperature (Brown 1969). Stream temperature influences water chemistry, which can affect the amount of oxygen present to support aquatic life. In addition, all aquatic organisms have a temperature range outside of which they cannot exist.
- Prevent detectable increases in water quantity (**peak flow**) during storm events. Peak flows can affect stream channels and in-stream habitat because of the large amount and high velocity of water moving through the stream.
- Protect the integrity of riparian forests from severe endemic **windthrow**. Windthrow is the breaking or blowing over of trees in the wind; severe endemic windthrow is windthrow in which 90 percent of an area will experience loss of at least 50 percent of the forest canopy (Mitchell and Lanquaye-Opoku 2007).

DNR focuses on these four measurable objectives because they are thought to be limiting factors in the restoration of riparian habitat. For example, the 1997 *Habitat Conservation Plan* attributed loss of riparian habitat in part to reduction in stream shade, channel erosion from peak flow, and loss of long-term sources of large woody debris (DNR 1997, p. IV.121). DNR also believes, as a working hypothesis, that by meeting the objectives of the riparian conservation strategy, which focus on a *subset* of riparian functions important to restoring and maintaining habitat, DNR will restore and maintain *all* of the riparian functions and processes necessary to meet the habitat needs of salmon and other riparian-dependent species.

On state trust lands in the OESF, DNR meets these measurable objectives by designating special management areas around streams. These areas are called riparian management zones. These areas are not harvest deferrals; they are areas managed to meet DNR’s four measurable objectives for riparian conservation. Riparian management zones also minimize the adverse effects of upland management activities on riparian areas.

The riparian management zone consists of an interior-core buffer, which is adjacent to the stream, and (where needed) an exterior buffer which is adjacent to the interior-core buffer. The width and purpose of the buffers, and the management activities that may be conducted within them, will differ under each alternative (refer to “Differences Between the Alternatives” in this chapter for more information). The riparian management zone

also protects potentially unstable slopes that have the potential to deliver sediment and debris to streams.

In addition to the four measurable objectives, DNR also follows current policies, rules, and procedures for the protection of wetlands. By meeting the four measurable objectives and protecting wetlands, DNR fulfills the commitments of the 1997 *Habitat Conservation Plan* and meets the requirements of the Clean Water Act (33 U.S.C. §1251 et seq. [1972]) and the Forest Practices Act (76-09 RCW).

The riparian conservation strategy is important to other OESF habitat conservation strategies. For example, marbled murrelets may benefit from the riparian conservation strategy since murrelets are known to nest in large platform-bearing trees that are likely to develop in riparian management zones. In this respect, the riparian conservation strategy forms the basis for an integrated habitat conservation approach for state trust lands in the OESF.

NORTHERN SPOTTED OWL HABITAT

Objective: 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 on state trust lands in each of the 11 landscapes⁷ in the OESF by developing and implementing a forest land plan that does not appreciably reduce the chances for the survival and recovery of the northern spotted owl sub-population on the Olympic Peninsula (DNR 1997, p. IV.86 through 106).

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.⁸ To provide this habitat, the northern spotted owl conservation strategy sets a minimum threshold⁹ for the amount of northern spotted owl habitat to be restored or maintained on state trust lands in each of the 11 landscapes in the OESF. The threshold is based on the 1997 USFWS criteria for incidental take. Incidental take is the taking (harm or killing) of a federally listed wildlife species if such take is incidental to, and not the purpose of, carrying out otherwise lawful activities (DNR 1997). The thresholds are as follows:

- Forty percent (by area) of state trust lands within each landscape are Young Forest Habitat or better (Young Forest or Old Forest).
- Of that 40 percent, at least 20 percent of state trust lands within each landscape are Old Forest Habitat.

For a description of northern spotted owl habitat types, refer to “Northern Spotted Owls,” p. 3-205.



MARbled MURRELET HABITAT

Objective: 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).

DNR is developing the long-term strategy in a separate planning process. This strategy is intended to provide long-term certainty for timber harvest and other management activities on forested state trust lands and to contribute to long-term conservation for the marbled murrelet, consistent with commitments in the 1997 *Habitat Conservation Plan*. On March 16, 2012 the Board and USFWS jointly adopted a draft statement of the purpose, need, and objectives for the long-term strategy.

MULTISPECIES HABITAT

Objective: Per the requirements of the **multispecies conservation strategy** for state trust lands in the OESF, meet 1997 *Habitat Conservation Plan* objectives for unlisted species of fish, amphibians, birds, and mammals by implementing conservation strategies for riparian areas, northern spotted owls, and marbled murrelets and by implementing additional site-specific conservation measures in response to certain circumstances (DNR 1997, p. IV.134 through 143).

As part of this strategy, DNR will follow current procedures for protection of unique habitats such as talus fields, wetlands, cliffs, and balds and for protection of the species of concern listed in the 1997 *Habitat Conservation Plan*. Procedures are included in Appendix F.

RESEARCH, MONITORING, AND ADAPTIVE MANAGEMENT

Objective: Implement a **research and monitoring program** for state trust lands in the OESF in the context of a structured, formal **adaptive management process** (DNR 1997, p. IV. 82 through 85).

These topics were discussed under “DNR’s Management Approach: Integrated Management” in this chapter.

Alternatives

DNR is proposing two alternatives for this proposed action, the **No Action Alternative** and the **Landscape Alternative**. These alternatives will be explained in this section.

Both of DNR’s alternatives meet all applicable **federal and state laws**. Examples of applicable laws include the Shoreline Management Act (Chapter 90.58 RCW), which protects valuable shoreline resources, and the Clean Water Act, which established the basic structure for regulating discharge of pollutants into the waters of the United States. The Washington Clean Air Act (70.94 RCW) and SEPA, the federal Multiple Use Act and

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.

The forest land plan will be based on the final selected alternative. As stated in Chapter 1, 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.

Why Is There Only One Action Alternative?

According to DNR’s statement of purpose, need, and objectives (refer to Chapter 1), 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. DNR’s management objectives are listed in the preceding section and summarized in the statement of purpose, need, and objectives in Chapter 1.

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 requirements described in the purpose, need, and objectives statement in Chapter 1. At the end of this chapter, DNR describes the alternatives that were considered but eliminated from detailed study and explains why they were eliminated.

Differences Between the Alternatives

As implemented on the ground, the two alternatives will 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 they implement integrated management. Under the No Action Alternative, which represents current management practices, 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 Using a Forest Estate Model

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. This type of planning, which was



recommended in the 1997 *Habitat Conservation Plan*, requires powerful, computer-based analytical tools. DNR uses several, but the tool most central to forest land planning is the forest estate model.

WHAT IS A FOREST ESTATE MODEL, AND HOW DOES IT WORK?

The forest estate model is a mathematical computer model of the forest. Capable of manipulating vast quantities of data, it is often used to develop solutions to problems that are too complex to solve using other tools.

The model is built with information on current conditions, management objectives, and management activities and an understanding of natural growth processes and how forests respond to management activities. By simultaneously considering all of this information, the model 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 time to meet both revenue production and ecological values objectives as effectively and efficiently as possible. To make these decisions, the model considers numerous inter-related factors, such as when the stand will be mature enough to harvest, whether or not it is deferred from harvest, how it may contribute to the objectives of DNR’s conservation strategies and how it may contribute to revenue production. Refer to Appendix D for a full explanation of how the model works.

The model provides two major types of outputs.

- A **harvest schedule**. The harvest schedule is the model’s solution in list and map form. It projects the types, locations, and timings of harvests for the 100-year analysis period (reported in decade intervals). By consulting the harvest schedule, DNR foresters and managers can determine which harvest activities are projected for a given area in a given decade. For example, in one area the model may project a thinning in Decade 3 and a variable retention harvest in Decade 8. In others, the model may project a thinning in Decade 5, or no harvest in any decade because the stand is deferred from harvest.
- A **state of the forest file**. The state of the forest file is a forecast of forest conditions that are projected to occur over 100 years as a result of implementing the harvest schedule. Foresters can use the state of the forest file to access information about the current condition of a forest stand, and how the condition of that stand may change based on a series of management activities. For example, if a forest stand is thinned in Decade 3, what condition will it be in by Decade 6? Will the forest stand have one canopy layer or two? Will it develop into northern spotted owl habitat?

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 Chapter 3 for more information).

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. Information management, as explained later in this section, is critical to this process. More information on the advantages and caveats of the forest estate model can be found in Chapter 3 and Chapter 4 of this RDEIS (p. 3-12 and 4-10, respectively).

Research and Monitoring

Under the No Action Alternative, DNR will develop an informal research and monitoring program that includes implementation, effectiveness, and validation monitoring. Research will focus on the key research priorities of the 1997 *Habitat Conservation Plan*.

Under the Landscape Alternative, DNR will develop a formal research and monitoring program that will include implementation, effectiveness, and validation monitoring. Research will focus on both the research priorities of the 1997 *Habitat Conservation Plan* and key uncertainties identified during this forest land planning process. Research and monitoring will be implemented in the context of a structural, formal adaptive management process. Refer to Chapter 4 (p. 4-10) for a list of scientific and data uncertainties identified during development of the forest estate model and the RDEIS. Refer to Appendix A (draft forest land plan), Chapter 4 for more information on research and monitoring.

Adaptive Management

In the 1997 *Habitat Conservation Plan*, adaptive management is defined as a process which provides for ongoing modification of management practices in response to new information. DNR will continue to implement this process under the No Action Alternative. As information becomes available through research and monitoring, it will be applied, as appropriate, to future management decisions to refine and improve integrated management of state trust lands in the OESF.

Under the Landscape Alternative, adaptive management will be defined as a formal, structured process for continually improving management practices by learning from the outcomes of operational and experimental approaches (Bunnell and Dunsworth 2009). The process will have clearly defined steps. These steps include defining specific adaptive management questions, linking questions to uncertainties identified in this forest land planning process, addressing those uncertainties through research and monitoring, evaluating and interpreting the information gained, recommending changes in management (if appropriate), and going through a formal decision process to apply those changes to management. Chapter 4 of the draft forest land plan for the OESF (Appendix A) provides a detailed description of DNR’s proposed adaptive management process under the Landscape Alternative.

Information Management

Information management is the means by which data and information are collected, organized, analyzed, and interpreted for the intended audience and distributed for use in future decision making. Information management provides crucial links between operations, research and monitoring, and planning.

Under the No Action Alternative, information management will focus on day-to-day operations. Data and information will be gathered during timber sale design and other management activities and placed in existing corporate and regional databases or in timber sales documentation such as SEPA checklists. Information gathered through research and monitoring will be distributed in reports.

Under the Landscape Alternative, information management will focus on implementing and monitoring the forest land plan. DNR will develop processes and tools to organize, collect, analyze, interpret, and distribute relevant data and information.

- Data and information gathered in the field during timber sales preparation will be incorporated into the forest estate model. Outputs from future forest estate models runs, such as harvest schedules, will be distributed to foresters for planning future forest management activities.
- Information gathered through research, monitoring, and operations will be assessed for potential changes in management through a formal adaptive management process, as described previously. Similar to the No Action Alternative, information gathered through research and monitoring will be distributed in reports.

Implementation of the Riparian Conservation Strategy

Under both alternatives, DNR will meet the objectives of the riparian conservation strategy by establishing riparian management zones on streams. Riparian management zones consist of an interior-core and exterior buffer. Following, DNR explains the differences in how the riparian management zone is established and managed under each alternative.

RIPARIAN MANAGEMENT ZONES UNDER THE NO ACTION ALTERNATIVE

Under the No Action Alternative, DNR will design riparian management zones and conduct watershed assessments at the time of each timber sale.

Interior-core Buffer

Interior-core buffers will be designed to protect floodplains and potentially unstable slopes. 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.¹⁰ 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.

On all streams, regardless of type, DNR will place a 30-foot-wide equipment limitation zone immediately adjacent to the stream. In this area, equipment use will be limited to protect stream banks. Because the width of the floodplain differs with each stream, the equipment limitation zone may be wider or narrower than the floodplain.

Exterior Buffer

Exterior buffers will be placed along all interior-core buffers. The exterior buffer will be designed to maintain or aid restoration of the riparian forest's potential to provide shade and large woody debris to the stream channel. The exterior buffer will protect the interior-core buffer from severe endemic windthrow. The width of the exterior buffer will be similar to the average widths listed in the 1997 *Habitat Conservation Plan*: 150 feet for Type 1 through Type 3 streams and 50 feet for Type 4 streams (DNR 1997, p. IV.117). DNR also places a 50-foot-wide exterior buffer on the interior-core buffer of Type 5 streams on unstable ground.

Variable retention harvest will not be conducted in exterior buffers. DNR anticipates one thinning harvest in the 100-year analysis period in exterior buffers.

Twelve-Step Watershed Assessment Process

After buffers are designed, DNR will use a twelve-step watershed assessment process to determine if, taken together, the interior-core and exterior buffers meet the objectives of the riparian conservation strategy. The twelve-step process enables DNR to evaluate streamside conditions in the context of physical, biological, and land use influences throughout the watershed (DNR 1997, p. IV.127). Buffers may be adjusted (wider or narrower) according to the results of the twelve-step process.

RIPARIAN MANAGEMENT ZONES UNDER THE LANDSCAPE ALTERNATIVE

Under the Landscape Alternative, DNR will design riparian management zones for streams across state trust lands in the OESF through the “planning from a landscape perspective” process. DNR will conduct watershed assessments using a forest estate model.

Interior-Core Buffers

Interior-core buffers will be designed to protect floodplains and unstable slopes, maintain or aid restoration of the riparian forest’s potential to provide shade and large woody debris to the stream channel, and avoid detectable increases in peak flow. 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. On all streams, regardless of type, DNR will apply a 30-foot-wide equipment limitation zone.

For Type 1 through Type 4 streams on stable ground, the widths of interior-core buffers will be similar to the average buffer widths listed in Table IV.10 in the 1997 *Habitat Conservation Plan* (refer to Text Box 2-4). Interior-core buffers will be widened, where necessary, to incorporate all potentially unstable slopes and landforms with the potential to deliver sediment and debris to the stream network.

In the interior-core buffer, DNR allows activities that support the integration of revenue production and ecological values. These activities include the following: precommercial thinning, selective harvest of hardwoods to encourage long-term sources of coniferous woody debris and channel bank stabilization, uniform and variable density thinning of forest stands to promote habitat development and wind-firm trees (trees that are less likely to blow over in the wind), and research projects, such as those designed to improve the integration of revenue production and ecological values (refer to Text Box 3-1 for a description of DNR’s harvest methods).

A small amount of variable retention harvest also will be allowed within the interior-core buffer. The amount is determined through a watershed assessment process in the forest estate model.

Text Box 2-4. Average-Width Interior-Core Buffers Under the Landscape Alternative

For stream types 1 through 4 on stable ground, the 1997 Habitat Conservation Plan (DNR 1997 p. IV.123) lists the following average widths for interior-core buffers:

- Type 1 and Type 2 streams: 150 feet
- Type 3 and Type 4 streams: 100 feet

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.

Buffers are measured outward from the outer edge of the 100-year floodplain and the floodplain itself is considered part of the buffer.

As explained previously, the forest estate model determines the optimal solution of when, where, and how much to harvest to meet multiple objectives across state trust lands in the OESF. As the model runs, it evaluates the ecological condition of each Type 3 watershed simultaneously through a watershed assessment process to determine the amount of riparian forest needed to accomplish the following measurable objectives:



- Maintain or aid restoration of the riparian forest’s potential to provide large woody debris to streams in each Type 3 watershed. Proposed timber harvests should either prevent a decrease in large woody debris recruitment potential, or lead to an increase in recruitment potential over time.
- Maintain or aid restoration of the riparian forest’s potential to provide shade to streams in each Type 3 watershed. Proposed timber harvests should either prevent a decrease in shade potential, or lead to an increase in shade potential over time.

The model also determines how many acres of variable retention harvest it can schedule in each decade in each Type 3 watershed without causing a detectable increase in peak flow. Peak flow is prevented by maintaining a sufficient amount of hydrologically mature forest in each Type 3 watershed. A hydrologically mature forest has higher relative density,¹¹ meaning there is a denser forest canopy to intercept snowfall and often more vegetation to absorb or slow water. Much of the snow caught in the canopy melts and evaporates or sublimates and thus does not reach the stream (Grant and others 2008). Also, trees dissipate heat by long wave radiation, which can melt the snow pack under a forest canopy. Therefore, snow packs in hydrologically mature forests are not as deep. These forests contribute less to peak flow during storm events. By contrast, a hydrologically immature forest is young (less than 25 years old) and sparse (relative density less than 25). Peak flow and hydrologic maturity are discussed in more detail in “Riparian,” p. 3-50.

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. In the following discussion, DNR refers to these acres as “allowed acres of variable retention harvest.”

To provide operational flexibility, foresters are given two options on where to place the allowed acres of variable retention harvest. Foresters may choose either option (refer to Figure 2-2 on p. 2-20).

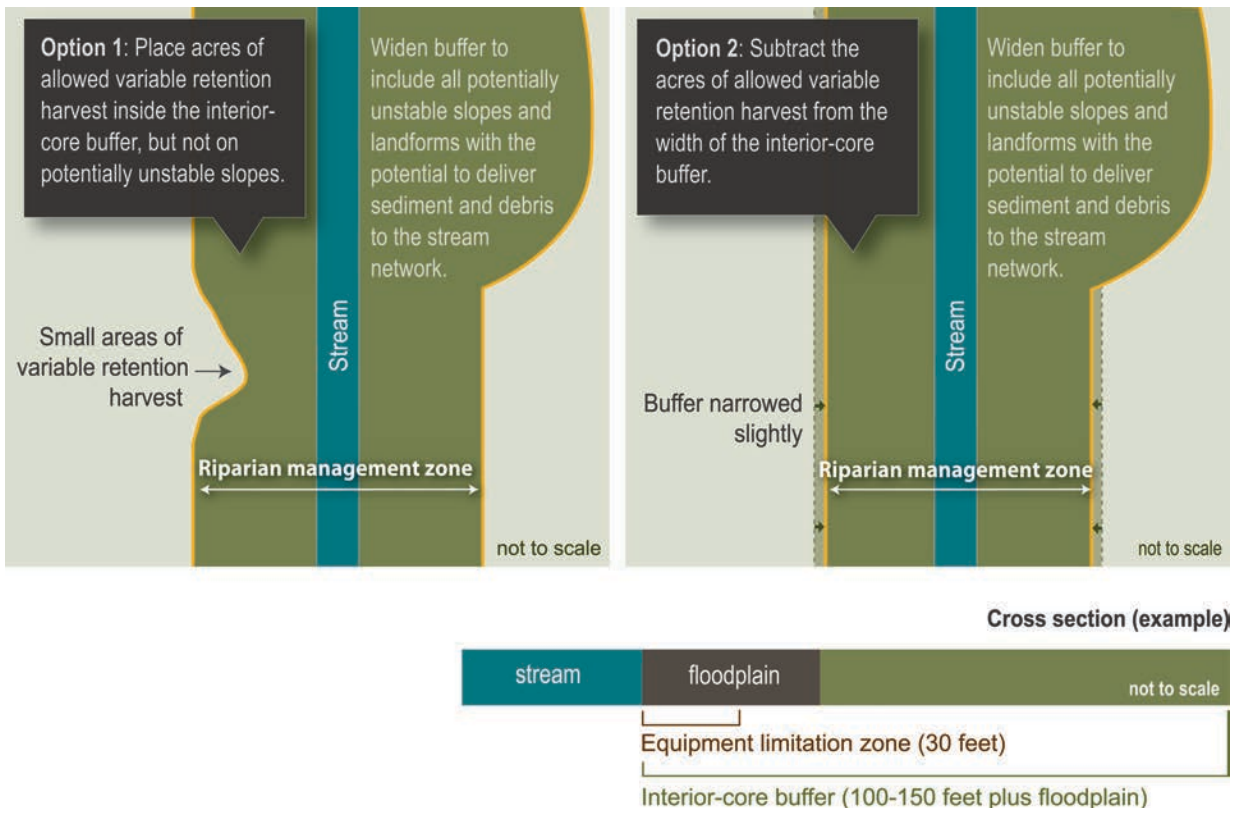
- Option 1, interior-core buffer with small areas of variable retention harvest:** Under this option, foresters can place allowed acres of variable retention harvest within the interior-core buffer, but not on potentially unstable slopes.
- Option 2, adjusted-width interior-core buffer:** Under this option, no variable retention harvest is allowed inside the interior-core buffer except for rights-of-way for roads or salvage in the case of a natural disturbance (refer to the draft procedure “Response to Natural Disturbances” in Appendix F). Instead, foresters subtract the acres of allowed variable retention harvest from the width of the interior-core buffer. On average, the interior-core buffer is narrowed by approximately 2 percent.

As mentioned under “Planning from a Landscape Perspective,” DNR will rerun the forest estate model periodically to reflect updated information. DNR will recalculate the acres of allowed variable retention harvest for future decades each time the model is rerun.

Exterior Buffers

Under both options of the Landscape Alternative, DNR will use a combination of remote reconnaissance, field assessments, and a windthrow probability model (Mitchell and Lanquaye-Opoku 2007) specifically designed and calibrated for use on the Olympic Peninsula to assess windthrow probability across state trust lands in the OESF. Exterior buffers will be applied to segments of interior-core buffers where there is a 5 percent

Figure 2-2. Options for Placement of Allowed Variable Retention Harvest on Type 1 through Type 4 Streams on Stable Ground



or greater probability of severe endemic windthrow, according to model results. DNR's preliminary analysis has shown that exterior buffers will be needed infrequently. Given a 5 percent probability of severe endemic windthrow, 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, according to model results. Refer to "Riparian," p. 3-87 for more information.

Where applied, the exterior buffer will extend approximately 80 feet (horizontal distance) from the outer edge of the interior-core buffer. An 80-foot exterior buffer is proposed based on the findings of Lanquaye (2003) that more than 75 percent of windthrow occurs within approximately the first 80 feet of a forest stand, measured from an exposed edge. An exterior buffer of 80 feet is expected to protect most of the interior-core buffer when applied. The wind model calibrated for the OESF (Mitchell and Lanquaye-Opoku 2007) also incorporates these findings.

Management activities in the exterior buffer are designed to produce and maintain forest stands that are wind-firm, robust, and structurally and compositionally diverse. The management activity most likely to occur is thinning. Figure 2-3 on p. 2-22 summarizes the on-the-ground differences in how the buffers are applied under each alternative.

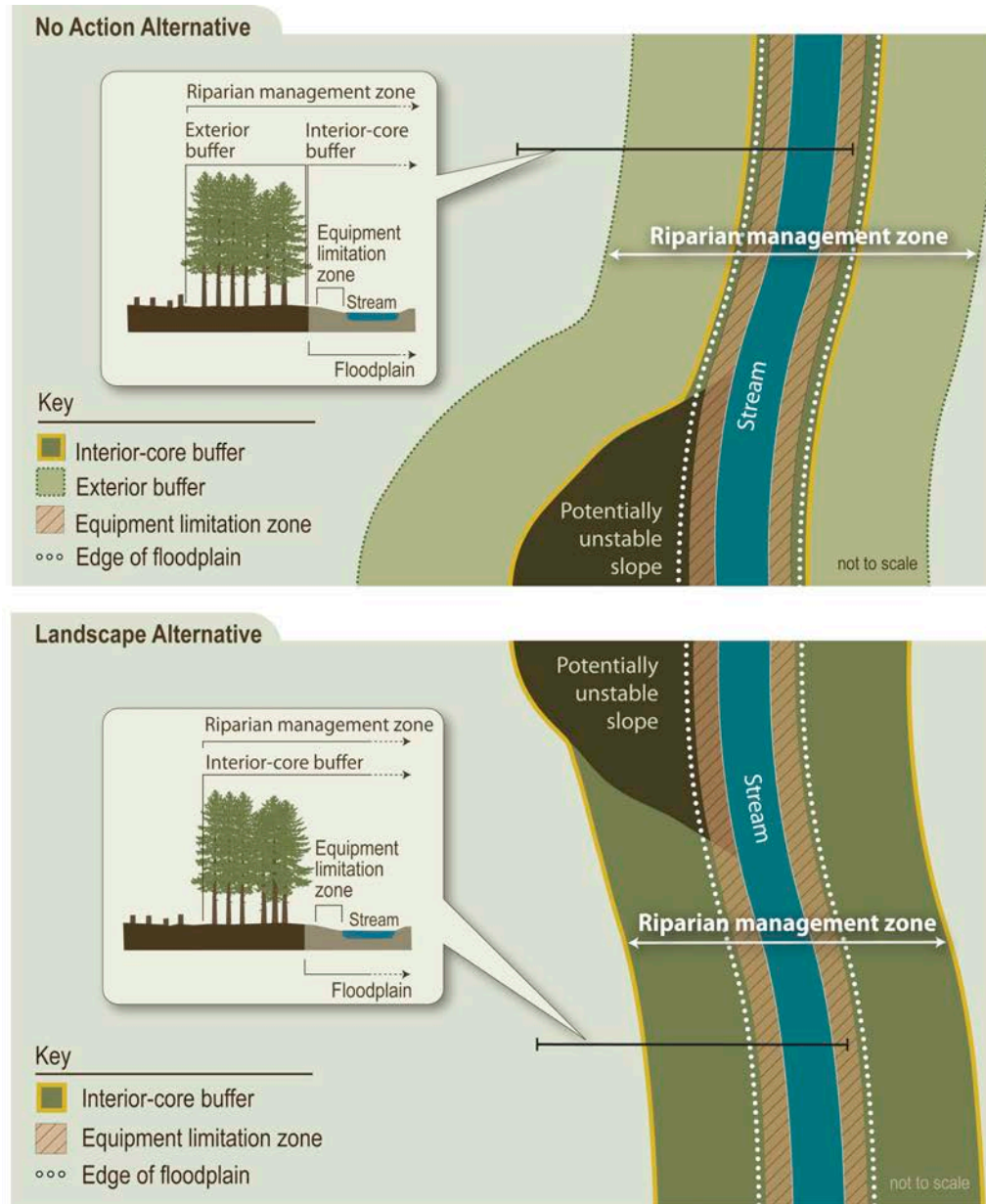
Implementation of the Northern Spotted Owl Habitat Conservation Strategy

Under either alternative, DNR will restore and maintain thresholds of northern spotted owl habitat on state trust lands in each of the 11 landscapes of the OESF. DNR will use the following techniques:

- Under the No Action alternative, DNR will continue to assess and track northern spotted owl habitat using habitat maps. To develop habitat maps, DNR queries its forest inventory database¹² to determine which forest stands on state trust lands in the OESF currently meet DNR's definitions of northern spotted owl habitat. DNR also uses aerial photographs and field surveys to identify any additional areas of habitat not identified using the forest inventory database. Habitat maps will be updated periodically during the 100-year analysis period.
- Under the Landscape Alternative, DNR will use the forest estate model to track the amount of habitat in each landscape and to project the amount of habitat that may develop in the future. Existing habitat maps were used as input into the model.

Figure 2-3. Conceptual Drawing Showing Differences Between Buffers as Applied Under the No Action and Landscape Alternatives

Example shown is a Type 3 stream. The Landscape Alternative is shown without an exterior buffer; DNR anticipates that exterior buffers will be applied infrequently under this alternative.



Comparison of Buffer Widths, Types 1 through 4 Streams on Stable Ground

	No Action Alternative	Landscape Alternative
Type 1 and 2	Interior-core: Floodplain plus potentially unstable slopes Exterior core: 150 feet	Interior-core: 150 feet plus floodplain and potentially unstable slopes Exterior: 80 feet (if needed)
Type 3	Interior-core: Floodplain plus potentially unstable slopes Exterior core: 150 feet	Interior-core: 100 feet plus floodplain and potentially unstable slopes Exterior: 80 feet (if needed)
Type 4	Interior-core: Floodplain plus potentially unstable slopes Exterior core: 50 feet	Interior-core: 100 feet plus floodplain and potentially unstable slopes Exterior: 80 feet (if needed)

2006 SETTLEMENT AGREEMENT

The 2006 Settlement Agreement (PR 14-001-030)¹³ limits the amount of harvest that can occur in forest stands that are 50 years old and older (acreage limits are listed in PR 14-004-120; refer to Appendix F).

Under the No Action Alternative, the restriction on harvesting forest stands 50 years old and older will continue until the 2006 Settlement Agreement expires; expiration will occur when DNR adopts a new sustainable harvest level that extends beyond 2014 (but no earlier than June 30, 2014).

Under the Landscape Alternative, the restriction on harvesting stands 50 years old and older will expire when DNR adopts the final forest land plan for the OESF. Stands that are more than 50 years old will be available for harvest unless those stands are identified as Old Forest Habitat, or are deferred from harvest to meet other objectives.

Response to Natural Disturbances

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 2006, p. 32). Under both alternatives, until the 2006 Settlement Agreement expires, DNR will continue to follow its current procedure for salvage of down wood following natural disturbances ("Interim Direction for Addressing Blowdown (windthrow) in Northern Spotted Owl Habitat;" refer to Appendix F). The current procedure provides detailed instructions for when and how wood may be salvaged without impacting habitat for northern spotted owls.

Under the No Action Alternative, after the 2006 Settlement Agreement expires, DNR will revert to its process of managing natural disturbances on a case-by-case basis, which includes consultation with the Federal Services as needed.

Under the Landscape Alternative, once the 2006 Settlement Agreement expires, DNR will follow a new procedure for salvage of down wood (called "Response to Natural Disturbances," refer to Appendix F). The new procedure considers the scale, severity, and spatial configuration of the event and the conservation objectives for the disturbed area, and provides guidelines for responding on a case-by-case basis.

Differences Between the Alternatives: A Summary

Table 2-2 summarizes the major differences between the alternatives.

Table 2-2. Differences Between the Alternatives

Management topic	No Action Alternative	Landscape Alternative
Implementing Integrated Management	Design of one timber sale, one watershed at a time using maps, databases, and other existing tools.	Planning from a landscape perspective: design of timber sales across state trust lands in the OESF using the outputs of a forest estate model.
Research and monitoring	Informal research and monitoring program focused on research priorities in the 1997 <i>Habitat Conservation Plan</i> .	Formal, structured research and monitoring program focused on research priorities in the 1997 <i>Habitat Conservation Plan</i> and uncertainties identified in this forest land planning process.
Adaptive management	Ongoing modification of management practices as needed.	Formal, structured process with clearly defined steps.
Information management	Focused on day-to-day operations.	Occurs in the context of implementing and monitoring the forest land plan.
Riparian Conservation Strategy	Riparian management zones and watershed assessments conducted at time of each timber sale. Assessments conducted using twelve-step watershed assessment process. No variable retention harvest conducted in riparian management zone. DNR anticipates one thinning over the 100-year analysis period.	Riparian management zones designed for streams across state trust lands in the OESF through the “planning from a landscape perspective” process. Watershed assessments conducted using a forest estate model. In riparian management zone, thinning and limited amount of variable retention harvest may occur.
Northern Spotted Owls Conservation Strategy	Restriction on harvest of forest stands 50 years old and older remains until 2006 Settlement Agreement expires (when DNR adopts new sustainable harvest level extending beyond 2014, but no earlier than June 30, 2014).	Restriction on harvest of forest stands 50 years old and older remains until DNR adopts the final forest land plan for the OESF.
Response to Natural Disturbances	Follow existing procedure until 2006 Settlement Agreement expires, then manage natural disturbances case-by-case.	Follow existing procedure until 2006 Settlement Agreement expires, then follow new procedure (refer to Appendix F).

Alternatives and Options Considered but Eliminated

As stated previously, DNR is proposing one action alternative, the Landscape Alternative. DNR considered numerous other action alternatives and options but eliminated them from detailed study for a variety of reasons. Following, DNR explains why they were eliminated.

Biodiversity Pathways

During the scoping process for the 2010 DEIS, Conservation Northwest, the National Audubon Society, the Olympic Forest Coalition, and the Washington Environmental Council (collectively referred to as Conservation Northwest and others) proposed an alternative based on “Biodiversity Pathways,” a concept Conservation Northwest and others discussed with DNR. Carey and others (1996) coined the phrase “biodiversity pathways” to mean the management of forest stands and forested landscapes to conserve biodiversity and generate revenue through the application of silviculture that accelerates the development of structurally complex stands. The alternative proposed by Conservation Northwest and others calls for DNR to practice biodiversity pathway silviculture wherever possible.

In 2004, DNR incorporated biodiversity pathways techniques into the preferred alternative for the 2004–2014 sustainable harvest calculation EIS. Called “Innovative Silvicultural Management,” this alternative consisted of existing DNR silvicultural practices, more intensive silviculture, and the following biodiversity pathways techniques: retaining biological legacies at harvest; underplanting widely spaced, site-appropriate coniferous species to supplement natural regeneration of tree and shrub species; thinning to variable densities to encourage development of an understory; and improving habitat by creating snags and felling trees to create structure (DNR 2004). It also included the option to disturb fewer forest ecosystem processes by minimizing site preparation.

DNR also wrote a draft silvicultural policy based on the preferred alternative: “General Silvicultural Strategy Applied to Timber Resources Base Available for Sustainable Harvest in Western Washington.” This policy stated “the department will use intensive and innovative silviculture to guide the desired progression of stand development to simultaneously produce trust revenue and create structural complexity” (DNR 2004). The policy described biodiversity pathways as a type of innovative silviculture that could be used to “create, develop, enhance, or maintain forest biodiversity and health” (DNR 2004).

DNR selected the preferred alternative in 2004 and, in 2006, finalized and incorporated the draft general silvicultural strategy into the 2006 *Policy for Sustainable Forests* (DNR 2006, p. 46). In this manner, innovative silviculture, which includes biodiversity pathway techniques, became part of DNR’s policy for creating and maintaining structural diversity in all of its habitat conservation planning units, including the OESF.

Since this alternative was adopted by the Board,¹⁴ DNR’s current policies and procedures incorporate the biodiversity pathways concepts into its silvicultural treatments. Because the final forest land plan for the OESF is required to be consistent with existing policies,

the silvicultural strategies suggested by Conservation Northwest and others have already been included in both the No Action Alternative and Landscape Alternative. Since the strategies are already incorporated into both alternatives presented in this RDEIS, it is not necessary to analyze them as a separate alternative.

Fixed Width Riparian Buffers

During the scoping process for the 2010 DEIS, Conservation Northwest and others also proposed an alternative under which fixed-width riparian forest buffers and wind buffers would be applied to all Type 1 through Type 4 streams; no watershed assessment would be conducted in conjunction with buffer design. These buffers would be equivalent in width to those proposed in the 1997 *Habitat Conservation Plan* (riparian forest buffers listed in Table IV.5, p. IV 58, and wind buffers listed in Table IV.8, p. IV.117). Harvest activities within riparian buffers would be restricted to thinning.

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. Also, the prescriptive approach was considered and analyzed in the *Final EIS for the Habitat Conservation Plan* (DNR 1996) but was not selected by the Board. Since this alternative was considered but not selected in an earlier phase of planning, and was not adopted as policy, this alternative is not analyzed in this RDEIS.

One-to-One

DNR considered a modification to the Landscape Alternative which would require equal acreages of variable retention harvest and thinning into the future across all state trust lands in the OESF. This modification, called “one-to-one” (1 acre of thinning to 1 acre of variable retention harvest), was based on a commitment in the 2006 Settlement Agreement. DNR used the forest estate model to examine this option and determined that one-to-one did not demonstrate an improvement or acceleration in meeting the objectives of the 1997 *Habitat Conservation Plan*. In addition, DNR found that this option would result in a considerable reduction in revenues because the costs associated with thinning were high and the price of the merchantable timber was low. DNR does not believe this option meets the purpose, need, and objectives for this proposal, which includes meeting 1997 *Habitat Conservation Plan* objectives and generating a sustainable flow of revenue for the trusts (refer to Chapter 1). Therefore, this modification is not analyzed in this RDEIS.

No Management

DNR used the forest estate model to examine a no-management alternative that deferred all state trust lands in the OESF from timber harvesting. According to model results, leaving the forest to grow on its own with no intervention did not demonstrate an improvement or acceleration in meeting 1997 *Habitat Conservation Plan* objectives and therefore was not considered reasonable. Many acres of state trust lands in the OESF are currently in the Competitive Exclusion stand development stage (refer to Text Box 3-2, p. 3-26 for a description of stand development stages); without intervention, these stands may remain in this stage for decades. In addition, the no-management option does not

produce revenues for trust beneficiaries and therefore would violate DNR’s trust mandate. DNR does not believe this option meets the purpose, need, and objectives for this proposal, which includes meeting 1997 *Habitat Conservation Plan* objectives and generating a sustainable flow of revenue for the trusts. Therefore, this alternative is not analyzed in this RDEIS.

Northern Spotted Owl Habitat Definition

DNR considered an option that would change northern spotted owl habitat definitions for state trust lands in the OESF, which would require an amendment to the 1997 *Habitat Conservation Plan*. However, DNR does not have sufficient scientific information at this time to identify what, if any, change in definition should occur. A change to the definition of northern spotted owl habitat was not analyzed in this RDEIS; however, the RDEIS includes an assessment of the potential environmental impacts of the alternatives on northern spotted owls.

Non-Integrated Approach

In contrast to DNR’s current approach of integrating revenue production and ecological values across state trust lands in the OESF, this alternative would divide state trust lands in the OESF into large areas dedicated to either revenue production or ecological values. This approach, referred to as the “zoned” approach, was examined as an alternative in the 1996 EIS for the 1997 *Habitat Conservation Plan* but was not selected. Since this alternative was considered but not selected by the Board in an earlier phase of planning and was not adopted as policy, it is not analyzed in this RDEIS. However, the Board may reconsider this alternative in the future.

Other Elements of the Environment Considered but Not Analyzed

During its public outreach process prior to the development of this RDEIS, DNR received comments on recreation, special forest products, visual impacts, land transactions, and cultural resources. However, DNR determined that the environmental impacts associated with these topics were not significant. Therefore, these elements are not analyzed in this RDEIS. Following is a brief discussion of these elements.

Recreation

Unlike other habitat conservation planning units, the OESF is located far from large population centers. Also, population density in the surrounding communities is low (15 to 40 people per square mile).¹⁵ In addition, there are few developed recreational facilities on state trust lands in the OESF. Recreational use is therefore minimal and dispersed. Because of the lack of comments related to recreation, and because both alternatives implement and do not change existing policies regarding recreation, DNR concluded that neither alternative will affect recreation and public use significantly. Therefore, this topic is not analyzed in this RDEIS.

Special Forest Products

DNR’s Olympic Region offers and manages leases for special forest products such as salal, evergreen huckleberry, sword fern, and moss. Permits are mainly issued to local harvesters, but a few large contracts in specific areas are issued to commercial harvesters. Because these special forest products are abundant and widely available throughout state trust lands in the OESF, DNR’s proposed alternatives are unlikely to result in probable significant adverse impacts to these products. Therefore, special forest products are not analyzed in this RDEIS.

Visual Impacts

In accordance with the 2006 *Policy for Sustainable Forests*, visual impacts are assessed on a site-specific basis when a timber harvest is designed. On-site mitigation, if needed, is developed at that time. Scoping comments did not suggest that visual impacts resulting from harvesting activities would be significant. Furthermore, mitigation for visual impacts is considered and incorporated at the site-specific stage. Both alternatives implement DNR’s existing policies on visual impacts. Therefore, visual impacts are not analyzed in this RDEIS.

Land Transactions

The federal Enabling Act of 1889 places restrictions on the disposal and leasing of the granted lands, the most prominent being disposition at public sale for not less than full market value. The state constitution also requires full compensation for the trusts when state trust lands are sold, transferred, or otherwise disposed (DNR 2006).

Financial diversification of trust lands is guided by DNR’s 1998 Asset Stewardship Plan. Since these lands are managed for the trusts in perpetuity, the long-term goal is to maintain approximately the same value of the land in order to keep each trust “whole.” DNR selectively repositions state trust lands through four different processes: land exchanges, public auctions, direct sales to public agencies, and replacement purchases.

DNR and Green Crow Corporation recently finalized the Foothills Land Exchange. A portion of this land exchange is within the OESF. In this exchange, isolated parcels of state trust lands in the Sekiu and Dickodochtedar landscapes were traded for parcels of land owned by the Green Crow Corporation in the Reade Hill and Kalaloch landscapes. This transfer consolidated state trust lands into blocks that are easier to manage for revenue production and ecosystem values. The Foothills Land Exchange was completed during the final formatting stage of the RDEIS and could not be included in this analysis. However, preliminary review of the land exchange maps led DNR to conclude that the effect of the land transfer on the analysis results would be negligible.

At this time, it is not possible to determine what, if any, future land transactions will occur on state trust lands in the OESF. In addition, similar to the preceding elements, existing policy will not be modified through either alternative. Therefore, land transactions are not analyzed in this RDEIS.

Cultural Resources

The forest practices rules¹⁶ (Title 222 WAC) define cultural resources as “archaeological and historical sites and artifacts and traditional religious, ceremonial, and social uses and activities of affected...tribes.” According to state and federal laws, cultural resources can include the built environment (buildings and infrastructure), places of historical significance (such as where a treaty was signed), artifacts and features providing evidence of human activity, traditional cultural places (such as a peak named in mythology), and historical objects, such as a ship.

The earliest arrival of humans in North America remains a source of academic debate, but people may have colonized the Americas prior to the end of the last glacial episode (Dillehay 2009). Because of changes in the relative sea level, major sites from this era are located offshore, although sites related to hunting, the extraction of stone and other resources, temporary camps, and riverine sites still exist in the OESF.

There are 162 recorded archaeological and historical sites in the OESF. They include four barns listed on the state Heritage Barn Register, seven sites listed on the Washington Heritage Register, and 16 sites listed on both the state and national registers (Kirk and Daugherty 2007). Most of the sites have been inventoried, but their significance and eligibility for national and state registers have not been evaluated.

DNR recognizes the significance of cultural resources, current cultural uses, and historic and archaeological sites and understands that cultural resources cannot be replaced. DNR also acknowledges the importance of government-to-government communications and collaboration with the tribes, as discussed in the Commissioner’s Order on Tribal Relations (DNR 2010).

DNR’s existing procedure for identifying historic sites (PR 14-004-150; refer to Appendix F) discusses the steps required to minimize or eliminate impacts to cultural resources to a non-significant level before an activity can take place on the ground; this procedure will not be changed by this proposal. Because DNR does not anticipate that cultural resources will be significantly impacted by either alternative, DNR did not analyze cultural resources in this RDEIS.

Endnotes

1. Site-specific evaluations allow DNR to reconsider all information, make any relevant changes based on localized conditions, and consider mitigation, if appropriate.
2. 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.
3. Operations that have been determined to have no direct potential for damaging a public resource (WAC 222-16-050).
4. Mature, structurally complex stands of 5 acres and larger that originated naturally before the year 1850.
5. DNR’s forest estate model was built using an established, industry-standard software platform: the Remsoft Spatial Planning System (Spatial Woodstock), a commercial forest estate model development platform by Remsoft Inc. Canada.



6. Adaptive management is referred to in the 1997 *Habitat Conservation Plan* as “Systematic Application of Knowledge Gained” (DNR 1997 p. IV.84).
7. A landscape is an administrative designation; refer to the introduction to Chapter 3 for more information.
8. 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).
9. The Draft EIS for the *Habitat Conservation Plan* (DNR 1996) evaluated individual landscapes to ensure that there was an adequate distribution of owl habitat across the OESF. At the time the *Habitat Conservation Plan* was developed, the best available science concluded that 30 to 50 percent habitat at spatial scales from home range to landscapes could support reproductive northern spotted owl pairs (Forsman and Meslow 1985; Bart and Forsman 1992; Carey and others 1992; Lehmkuhl and Raphael 1993; Holthausen and others 1995; Bart 1995). The *Habitat Conservation Plan* selected a minimum of at least 40 percent Young Forest Habitat and better (DNR 1997). Bart and Forsman (1992) hypothesized a threshold amount of 20 percent Old Forest Habitat was adequate, based on observations of significantly greater occupancy and productivity by northern spotted owls than areas with less.
10. DNR uses a numerical system (one through five) to categorize streams based on physical characteristics such as stream width, steepness, and whether or not fish are present. Type 1 streams are the largest; Type 5 streams are the smallest. Type 9 streams are “unclassified” and refer to streams that are currently mapped, but lack sufficient data to determine the correct water type. Only Type 1, 2 and 3 streams are considered fish-bearing. DNR and the Federal Services have agreed that 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 *Habitat Conservation Plan*. A comparison of DNR’s water typing system is provided in the rules (WAC 222-16-031).
11. Refer to “Forest Conditions and Management” for a definition of this term.
12. The forest inventory database includes information about forest stands including tree height, diameter, species, and spacing as well as attributes such as canopy layers, down wood, or snags.
13. Washington Environmental Council *et al.* v. Sutherland *et al.* Settlement Agreement (King County Superior Court No.04-2-26461-8SEA, dismissed April 7, 2006).
14. Board of Natural Resources Resolution 1110.
15. <http://www.ofm.wa.gov/pop/popden/default.asp>
16. The forest practice rules were written to implement the Forest Practices Act and have been amended several times since they were adopted in 1974.