Chapter 2

Alternatives

2. ALTERNATIVES

2.1 INTRODUCTION

This chapter describes and compares the alternatives under consideration in this Draft Environmental Impact Statement (DEIS), including the proposed action. The alternatives pertain to the Services' decision of whether to grant take authorization for the Forest Practices Regulatory Program and to the forest landowners that are regulated by the Program, including the State and large and small private forest landowners as defined in Washington Administrative Code (WAC) 222-16-010 ("Forest Landowner," effective October 31, 2003). Figure 1-1 in Chapter 1 provides a map of the lands subject to the Washington Forest Practices Regulatory Program. Table 1-2, also in Chapter 1, provides an acreage breakdown of the ownership of these lands. The first subsection below describes the process followed to formulate the alternatives. The next subsection describes the alternatives that are analyzed in detail in this EIS. That subsection is followed by a description of the alternatives that were considered but eliminated from detailed analysis.

2.2 ALTERNATIVE DEVELOPMENT

Beginning in late 2002 and continuing through late 2003, a series of meetings was held to discuss the impending application(s) from the State of Washington (hereinafter referred to as the State) for incidental take authorization under the Endangered Species Act (ESA), from the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS). These meetings were attended by representatives from the Services, the U.S. Environmental Protection Agency (EPA), the State (including the Governor's

office, Washington Department of Natural Resources, Washington Department of Ecology, and Washington Department of Fish and Wildlife), the Northwest Indian Fisheries Commission, the Washington Forest Protection Association, the Washington Farm Forestry Association, and the EIS consultant (Tetra Tech FW). The discussions at these meetings included possible alternatives to be considered in the EIS.

The results of public scoping for the EIS (subsection 1.4, Scoping and the Relevant Issues) were also used by the EIS team to help identify possible alternatives. Based on public scoping input and discussions at the EIS team meetings, seven alternatives were identified. Of these seven, four alternatives were found to capture the full range of reasonable alternatives, and are analyzed in detail in this EIS. The other three potential alternatives were considered but eliminated from detailed analysis because they would not fulfill the purpose and need for action.

2.3 ALTERNATIVES ANALYZED IN DETAIL

Four alternatives are analyzed in detail in this EIS. The alternatives differ in two primary ways: 1) the type of ESA take authorization that would be issued by the Services, and 2) the details of the forest practices regulatory and non-regulatory programs that would be implemented. With regard to the type of ESA take authorization, three possibilities are considered: 1) no ESA take authorizations, 2) issuance of ITPs by both Services and implementation of an HCP under ESA Section 10(a)(1)(B), and 3) issuance of a take limit (NMFS) or take exemption (USFWS) under ESA Section 4(d).

With regard to how the various components of the Forest Practices Regulatory Program would be conducted, 10 specific resource components are described within each of the four alternatives including: water typing, riparian habitat, wetlands, hydrology, forest pesticides, unstable slopes, forest roads, Watershed Analysis, cultural resources, and adaptive management. These 10 components correspond to the primary components of the forest practices rules.

The Washington Forest Practices Rules (WAC 222) are adopted by the Washington Forest Practices Board under the authority of the Washington Forest Practices Act (Revised Code of Washington [RCW] Chapter 76.09) and are administered and enforced by the Washington DNR as the Forests Practices Regulatory Program. These rules apply to forest management and timber harvest on all non-Federal and non-tribal forestlands in Washington State. However, the Washington Forest Practices Rules specify that existing HCPs and other conservation agreements that apply to certain non-Federal and non-tribal landowners may satisfy certain requirements in the rules. Landowners must provide to Washington DNR a proposed list of specific rules replaced by the existing HCP or other conservation agreement. Also, certain lands within urban growth areas are likely to be converted to other uses and may be regulated by city or county governments through local critical area ordinances.

The four alternatives described in this section include the no action alternative (No Action Alternative 1), two alternatives that represent the State's proposed action (Alternatives 2

and 3), and another alternative that represents a more protective alternative (Alternative 4). Two versions of the State's proposed action are included in this EIS because the State has applied for take authorizations under both ESA Section 10(a)(1)(B) and ESA Section 4(d).

2.3.1 Alternative 1 (No Action)

2.3.1.1 General Description

Under the No Action Alternative 1, the Services would not issue take authorization to the State of Washington for the Forest Practices Regulatory Program under ESA Section 10(a)(1)(B) or Section 4(d). The State would regulate non-Federal and non-tribal forestlands under the Forest Practices Regulatory Program in place in 2004, and as they may be modified under existing statutory authority into the future. The Services would enforce the prohibition against take of listed species through Section 9 of the ESA by prosecuting violations of the ESA, as appropriate. No defense to third party civil actions to enforce the take prohibition would be provided by any take authorization issued by the Services.

This alternative provides a baseline for comparison of the other three alternatives so that the effects of the other alternatives can be measured on a standard scale. The evaluation of effects is presented in Chapter 4, Environmental Effects.

Defining No Action Alternative 1 is somewhat complicated by the fact that the State of Washington is already implementing the Program for which it is seeking take authorization and has been directed by the State Legislature to apply for take authorization from the Services, anticipating that those Federal assurances will be obtained by June 30, 2005, (RCW Chapter 77.85.190(1)). Importantly, the Legislature indicated that if take authorization is not granted, the Legislature shall

> *…review chapter 4, Laws of 1999 sp. sess., all rules adopted by the Forest Practices Board, the Department of Ecology, or the Department of Fish and Wildlife at any time after January 1, 1999, that were adopted primarily for the protection of one or more aquatic resources and affect forest practices and the terms of the Forests and Fish Report, and shall take such action, including the termination of funding or the modification of other statutes, as it deems appropriate* (RCW Chapter 77.85.190(2)).

In addition, the Forest Practices Salmon Recovery Act: 1) directed the Forest Practices Board to adopt permanent rules consistent with the Forests and Fish Report (FFR) or to explain any deviations; 2) created landowner incentive programs to offset financial burdens placed upon landowners by the Washington Forest Practices Rules (Forestry Riparian Easement Program, RCW Chapter 76.13.100 et seq.; Riparian Open Space Program, RCW Chapter 76.09.040(3); Tax Credit Program RCW Chapters 84.33 and 34); and 3) provided direction to the Washington DNR and Washington Department of Ecology (Ecology) with respect to implementation, enforcement, and future changes to the Washington Forest Practices Rules. The complete text of Chapter 4 of the Laws of 1999 is provided in Appendix C of this DEIS.

As a result, the description of the No Action alternative requires, at a minimum, the interpretation of the statement of legislative intent contained in RCW Chapter 77.85.190(1) and the political influences, if any, that will be considered by the Legislature.

If the Services are unable to offer Federal assurances, and the Legislature "reviewed" the 1999 Forest Practices Salmon Recovery Act and the associated rules, the Legislature would almost certainly reconsider the passage of ESHB 2091 (FPHCP Appendix C) requiring rules based upon the FFR (FPHCP Appendix B). Any such review would be conducted within a context that would include the fact that, for the first time, a Timber, Fish, and Wildlife (TFW)/FFR-derived proposal did not result in the anticipated level of regulatory certainty. Regulatory certainly has historically been a primary outcome desired by commercial timberland owners and the State of Washington, in the TFW/FFR collaboration. In this instance, the *level* of regulatory certainty expected is not in question; it specifically anticipates Federal take authorization under the ESA.

If incidental take authorization did not accompany the adoption of the Washington Forest Practices Rules based on the Forests and Fish Rules, it is unlikely that landowners or some other participating stakeholders would view continued support of FFR collaboration to be in their best interest. In short, these stakeholders likely would have the view that they did not receive the "benefit of the bargain." They would be absorbing higher economic costs as a result of regulations without the anticipated economic savings provided by the regulatory certainty associated with take authorization.

While there may be many opinions, each person associates the "no action" alternative with some given level of regulatory certainty. Without the anticipated *added* regulatory certainty provided by take authorization, it is reasonable to assume that landowners, at least, would examine whether a *reduced* level of regulation would provide the *same* level of regulatory certainty as exists with the Washington Forest Practices Rules. It is reasonable to assume that they may perceive that conservation measures contained in the existing regulations, while potentially appropriate to meet the Section 10(a)(1)(B) or Section 4(d) standards, go beyond those necessary to avoid the reasonable risk of being found to violate Section 9 take prohibitions. Further, it is reasonable to assume that FFR stakeholders most affected by the lack of regulatory certainty would approach the Legislature accordingly. The specific language of RCW Chapter 77.85.190 clearly anticipates such a response to a failure to obtain take authorization.

Specific legislative response in the context of the No Action alternative and the resulting failure of the FFR collaboration is uncertain. The legislative language of RCW Chapter 77.85.190 anticipates a legislative response of some kind. Landowners, at a minimum, would believe that they had been adversely affected by the adoption of Washington Forest Practices Rules without the associated incidental take authorization. It is reasonable to assume that relevant statutes could be modified to allow the forest practices rules to be "rolled-back," at least to the point at which landowners believed that their risk of a claim under Section 9 was sustainable in a court of law (i.e., the point at which their perceived regulatory risk was not increased by the change in regulations).

The Legislature could also fail to act affirmatively in support of the Washington Forest Practices Rules based on the FFR, reducing or failing to fund FFR programs, resulting in the reduction or elimination of landowner incentive programs, research and adaptive management, and a reduction in staff for implementation and enforcement of the rules. Because of the legislative direction that regulations be modified by the Forest Practices Board essentially only through the adaptive management program (subsection 1.3.1.2, The Forests and Fish Report), reductions in the adaptive management program would slow the pace at which regulations are improved.

In summary, the No Action alternative could result in a range of possible outcomes that would occur over time, initiated by the deliberate action or inaction of state and Federal decision-makers and Forests and Fish stakeholders. With any of the outcomes, it is unlikely that the FFR would continue to be supported by many of the stakeholders. The precise range of outcomes is difficult to predict. However, to provide a meaningful baseline for comparison, two scenarios are described below which constitute the reasonable endpoints of the range of possible outcomes under No Action Alternative 1.

One scenario is represented by the current Washington Forest Practices Regulatory Program and Washington Forest Practices Rules. However, it is expected that Program elements would be less functional, particularly over time, under this scenario compared with current conditions.

The other scenario involves reverting back to the Forest Practices Regulatory Program and rules in effect on January 1, 1999. This scenario would require action by the Washington State Legislature. While the number of outcomes of potential legislative action is unlimited, the scenario is selected for three reasons. First, it encompasses to the fullest extent the legislative response to the stated intention to "review all rules adopted . . . at any time after January 1, 1999." Second, unlike any other potential scenario, the regulations in effect on January 1, 1999 are not speculative; they are specific and available for analysis and comparison in this DEIS. Third, while a "roll-back" of regulations could stop short of those in effect on January 1, 1999 (but require significant speculation to determine), those regulations clearly have been identified by the Legislature as the "sideboard" of potential changes so that any other reasonably likely outcome will lie within the scope of the analysis in this DEIS.

Alternatives 2, 3, and 4 are compared to both No Action Alternative 1 scenarios to measure the relative effects of those alternatives in Chapter 4 (Environmental Effects). Following is a description of the two No Action Alternative 1 scenarios.

No Action Alternative 1- Scenario 1: Current Washington Forest Practices Rules with a Degraded Adaptive Management Program

This scenario assumes that the current Washington Forest Practices Rules and DNR's current forest practices application review, approval, and compliance program would remain in effect. No legislative action would be taken to modify RCW Chapter 77.85.190. However, following a No Action decision by the Services, No Action

Alternative 1-Scenario 1 would likely result in a substantial reduction in the amount of collaboration and participation among Forests and Fish stakeholders (particularly landowner participation) in the implementation of many of the non-regulatory elements of the FFR. These non-regulatory elements include stakeholder support of and broad participation in adaptive management, alternate plans, board manual development, information technology, implementation tools, and training. Specifically, it is expected that landowner participation in the adaptive management program would cease because the cost of participation would not result in the anticipated benefit of regulatory certainty. Regulatory certainty, resulting from receiving ESA take authorization, is one of the primary incentives for landowner participation and support for implementation of the FFR. Further, because the economic benefits of regulatory stability would not be as anticipated, private forest landowners may be more likely to reduce silvicultural investments (e.g., thinning and fertilization) on their lands or convert their lands to non-forest purposes without Federal regulatory certainty.

Without stakeholder collaboration and participation, it is anticipated that public financial support for the non-regulatory elements of the FFR would likely terminate by the end of State fiscal year 2006 (June 30, 2006), which could result in a reduction in staff for implementation and enforcement of the Washington Forest Practices Rules.

Reduced stakeholder participation and reduced funding support would substantially degrade the adaptive management program, including the associated monitoring programs. These programs form the mechanism in the FFR for modifying the Washington Forest Practices Rules over time. As a result, the pace at which Washington Forest Practices Rules are improved over time would slow. For the same reason, assessing the degree to which the current Washington Forest Practices Rules meet established resource goals and objectives would be difficult and degrade over time. In addition, landowner incentive programs, such as the Riparian Open Space Program and the Forestry Riparian Easement Program, could be substantially reduced or terminated due to lack of funding.

No Action Alternative 1- Scenario 2: Washington Forest Practices Rules in Effect on January 1, 1999

No Action Alternative 1-Scenario 2 assumes that the outcomes described in No Action Alternative 1-Scenario 1 would occur, including lack of support, participation, and funding for implementation and enforcement of the current Washington Forest Practices Rules, the adaptive management program, and the landowner incentive programs. However, No Action Alternative 1-Scenario 2 also assumes that the Washington State Legislature would allow the Forest Practices Board to repeal the State rules that resulted from the FFR adopting in their place the rules that were in effect on January 1, 1999 (See above). The erosion of resource protective measures, as well as the lack of the anticipated regulatory certainty inherent in the failure to receive Federal assurances, would result in further reductions from No Action Alternative 1-Scenario 1 in both stakeholder participation and support for the non-regulatory element of the program as well as reductions in funding.

No Action Alternative 1-Scenario 2 would likely signify the end of the stakeholder collaboration based on the FFR.

2.3.1.2 Washington Forest Practices Rules and Program – Specific Description

Under No Action Alternative 1, the specific rules and programs to be implemented would vary depending on the scenario. A summary of the rules and programs under each scenario is provided below.

No Action Alternative 1- Scenario 1

With No Action Alternative 1-Scenario 1, the current Washington Forest Practices Rules and the Forest Practices Regulatory Program would be implemented. However, following a No-Action decision by the Services, No Action Alternative 1-Scenario 1 would likely result in a substantial reduction in the non-regulatory elements of the Forest Practices Regulatory Program based on the FFR, particularly over time. Specifically, it is expected that landowner participation in the adaptive management program would cease because the anticipated level of regulatory certainty provided by ESA take authorization or limits would not exist. Because the adaptive management program would be degraded, the pace at which the Washington Forest Practices Rules are improved over time would slow (subsection 1.3.1.2, The Forests and Fish Report).

Water Typing

Under No Action Alternative 1-Scenario 1, water-typing rules would be the same as the current rules. The following three water types are identified:

- Type S: All waters inventoried as Shorelines of the State.
- Type F: Waters not classified as Type S, which contain fish habitat. It also includes some waters diverted for domestic and fish hatchery use.
- Type N: Waters not classified as Type S or F, which are either perennial streams or are physically connected by an above-ground channel system to downstream waters such that water or sediment initially delivered to such waters will eventually be delivered to a Type S or F water. Type N waters include two subcategories: seasonal and perennial streams.

Streams of the State would be classified according to this system by the DNR in cooperation with Washington Department of Fish and Wildlife (WDFW) and Ecology, and in consultation with affected Indian Tribes. The mapping would be based on a multi-parameter, field-verified Geographic Information System (GIS) logistic regression model. This model would be fish habitat-driven and use geomorphic parameters such as basin size, stream gradient, and elevation. Until these water type maps are available, an interim typing system would be used. Fish habitat water types would be reviewed and updated, as necessary, every 5 years based on observed field conditions.

Riparian Habitat

Under No Action Alternative 1-Scenario 1, the riparian habitat rules would be the same as the current rules. Riparian Management Zones (RMZs) are identified along all Type S and F waters. RMZs are measured horizontally from the bankfull width or from the edge of the Channel Migration Zone, if present. The Channel Migration Zone is defined as the area where the active channel is prone to move and where such movement would result in a potential near-term loss of riparian forest adjacent to the stream. RMZs differ between western and eastern Washington. RMZ dimensions also vary depending on the stream type, the site class of the land adjacent to the typed water, the management harvest option, and the stream size. No-harvest buffers are identified along some Type N waters and Equipment Limitation Zones are identified along all Type N waters.

This section provides a general description of the riparian measures that would remain in effect under No Action Alternative 1-Scenario 1. A detailed description of these riparian habitat components is provided in WAC 222-30-021 and WAC 222-30-022.

In addition to the RMZ requirements identified in this section, Type S waters are given additional protection under the Shoreline Management Act. Restrictions under the Act are implemented and enforced at the county level and include the establishment of a 200-foot Shoreline Management Zone, measured from the ordinary high water mark along Shorelines of Statewide Significance. Typically, a landowner may remove no more than 30 percent of the available merchantable trees within the Shoreline Management Zone, every 10 years using a selective harvest strategy, unless either local government or Ecology grants prior approval.

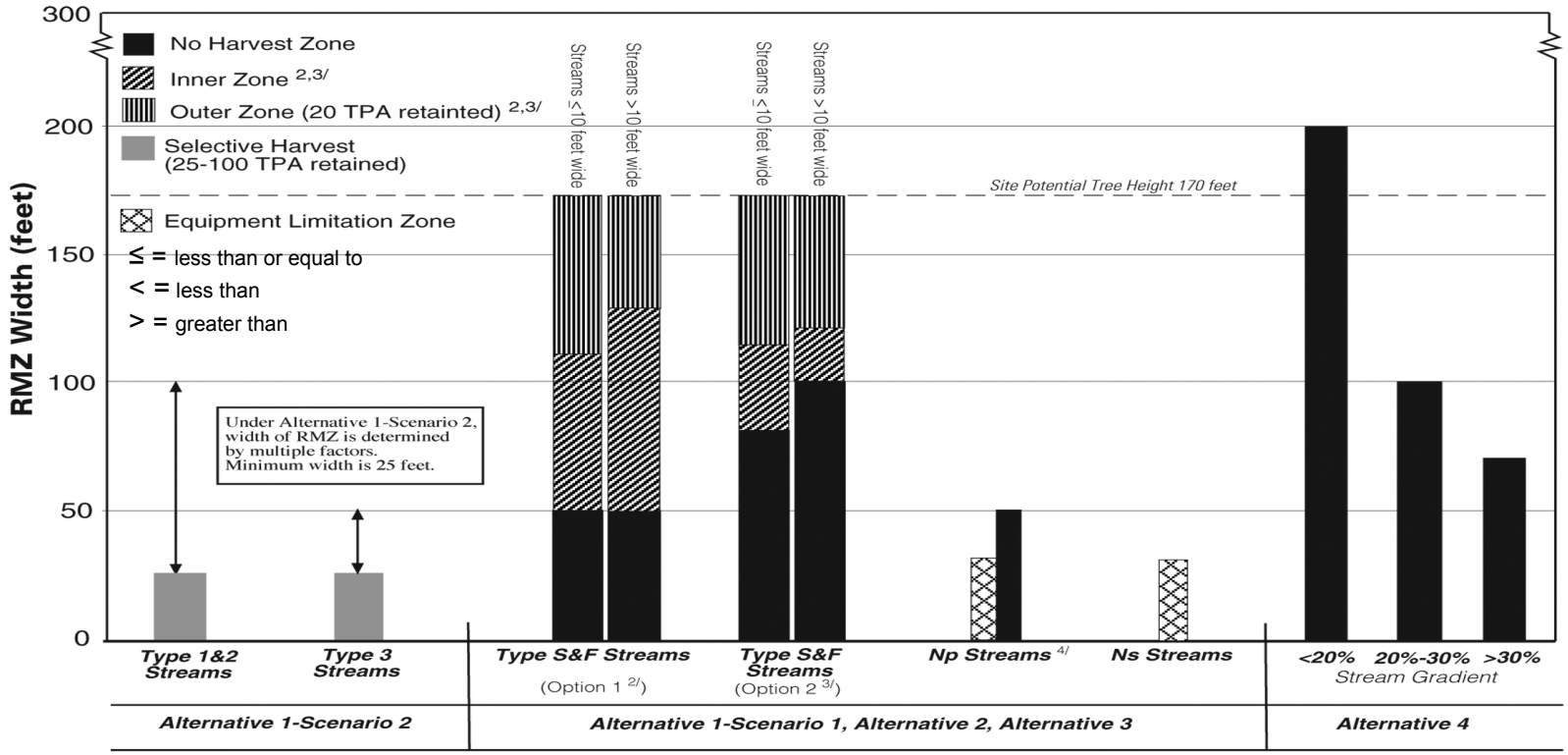
Western Washington—Type S and F Waters

In western Washington, RMZs for Type S and F waters are divided into three zones along the stream: the core zone is adjacent to the bankfull width or Channel Migration Zone outer edge and is closest to the water, the inner zone is adjacent to the core zone, and the outer zone is adjacent to the inner zone and is farthest from the water (Figure 2-1).

Core Zone. The core zone in western Washington is 50 feet in width. With the exception of approved road crossings and yarding corridors, no timber harvest or construction is allowed in the core zone. Any trees cut for or damaged by yarding corridors must be left on the site. Any trees cut as the result of road construction to cross a stream may be removed from the site, unless used as part of a large woody debris (LWD) placement strategy or as needed to reach stand requirements.

Inner Zone. The inner zone varies from 10 to 100 feet in width, depending on stream size, forestry site class of adjacent lands, and the management option selected (described below). Timber harvest in the inner zone is permitted only when the riparian characteristics of an existing stand exceed the riparian stand target requirement. The stand requirement is the number of trees per acre; basal area per acre; and the proportion of conifer, in the combined inner zone and adjacent core zone, that will provide target riparian stand conditions when the stand is 140 years old. This future stand is referred to

Figure 2-1. Western Washington RMZ Characteristics by Alternative (using Site Class II, Site Potential Tree Height = 170 feet, as an example[1/]) (Note: Does not include Channel Migration Zone or Beaver Habitat Zone).



1/ Under No Action Alternative 1-Scenario 1, Alternative 2, and Alternative 3, total width of the RMZ varies by site class, ranging from 90 feet (Site Class V) to 200 feet (Site Class I).

2/ For Type S and F streams, Option 1 calls for thinning from below in the inner zone, and 20 riparian leave trees per acre in the outer zone.

3/ For Type S and F streams, Options 2 calls for leaving enough riparian leave trees in the inner zone to meet the stand requirements (a basal area of 275 ft^2/acre at stand age 140 years, in this example of a Site Class II stand), plus an additional 20 riparian leave trees per acre in the outer zone. If no-harvest restrictions in the core zone result in conditions that will exceed the stand requirements, fewer trees may be left in the outer zone.

4/ For most Type Np streams, a no-harvest buffer is established along the first 300 to 500 feet upstream of the confluence of an Np stream with a Type S or F stream and adjacent to specified areas so that no less than 50 percent of the length of the stream is buffered.

as the desired future condition (DFC) and varies with the site class. Growth modeling is necessary to calculate whether a particular stand meets the stand requirement and is on a trajectory towards the DFC. The growth model is based on stand characteristics and on specific components identified in the Forest Practices Board Manual (2001).

When the existing stand in the combined core and inner zone does not meet stand target requirements, no harvest is permitted in the inner zone, except for the purpose of hardwood conversion (See below). Two management options are available when basal area exceeds the stand requirement. Widths of inner and outer zones differ between Option 1 and Option 2.

Option 1 for Inner Zones—Thinning from Below. If trees can be harvested and removed from the inner zone because of surplus basal area consistent with the stand target requirement, then Option 1, referred to as "thinning from below," can be implemented. The objective of thinning is to distribute leave trees in such a way as to shorten the time required to provide large wood for fish habitat and to protect water quality. This is achieved by increasing the potential for leave trees to grow larger and more rapidly than they otherwise would without thinning. Trees harvested under Option 1 must comply with the following:

a) Residual trees left in the combined core and inner zones must meet stand target requirements necessary to be on a trajectory to DFC.
b) Thinning must be from below, meaning the smallest diameter (in diameter at breast height [dbh]) trees would be selected for harvest first, then selection would progress to successively larger diameters.
c) Thinning cannot decrease the proportion of conifer in the stand.
d) Shade retention to meet the shade rule must be confirmed by the landowner for any harvest inside of 75 feet from the bankfull width or edge of the Channel Migration Zone, whichever is greater.
e) The number of residual trees per acre in the inner zone will equal or exceed 57.

Two other factors affect the amount of harvest under Option 1: 1) the presence of existing stream-adjacent parallel roads within the inner or core zone and 2) the use of yarding corridors across the RMZ. In both cases, the shortfall of basal area due to these factors has to be accounted for by reducing harvest elsewhere in the forest practice unit boundary. Implementation of an acceptable LWD placement plan can be used to make up for shortfalls due to stream-adjacent parallel roads.

Table 2-1 identifies the width of each zone within an RMZ in which Option 1 is implemented, given the stream width and site class of adjacent land.

Table 2-1. Option 1, Thinning from Below.

Site Class	RMZ Width (feet)	Core Zone Width (measured from Bankfull width or Channel Migration Zone of water) (feet)	Inner Zone Width (measured from outer edge of core zone)		Outer Zone Width (measured from outer edge of inner zone)	
			Stream Width ≤10 feet	Stream Width >10 feet	Stream Width ≤10 feet	Stream Width>10 feet
I	200	50	83	100	67	50
II	170	50	63	78	57	42
III	140	50	43	55	47	35
IV	110	50	23	33	37	27
V	90	50	10	18	30	22

≤ = less than or equal to
≥ = greater than or equal to
< = less than
> = greater than

Option 2 for Inner Zones—Leaving Trees Closest to the Water. If trees can be harvested and removed from the inner zone because of surplus basal area consistent with the stand target requirement, then Option 2 can be implemented. Option 2 applies only to RMZs on Site Classes I, II, and III, on streams that are less than or equal to 10 feet wide, and to RMZs on Site Classes I and II for streams greater than 10 feet wide. Harvest must comply with the following:

a) Harvest is not permitted within 30 feet of the core zone for streams less than or equal to 10 feet wide, and harvest is not permitted within 50 feet of the core zone for streams greater than 10 feet wide.

b) Residual leave trees in the combined core and inner zone must meet the stand target requirements needed to be on a trajectory to the DFC.

c) A minimum of 20 riparian leave trees per acre must be retained in any portion of the inner zone where harvest occurs. These riparian leave trees are not counted or considered towards meeting applicable stand requirements, nor can the number be reduced below 20 for any reason.

d) Trees are selected for harvest starting from the outermost portion of the inner zone first, then selected progressively closer to the stream.

e) If the existing stand conditions in the core and inner zones result in surplus basal area per the stand target requirement, the landowner may take credit for the surplus by harvesting additional riparian leave trees required to be left in the adjacent outer zone on a basal-area-for-basal area basis. The number of leave trees in the outer zone cannot be reduced below 10 trees per acre (except for Channel Migration Zone credit).

As is the case for Option 1, the presence of stream-adjacent parallel roads within the inner or core zone and the use of yarding corridors across the RMZ also affect the amount that can be harvested under Option 2. In both cases, the shortfall of basal area due to these

factors has to be accounted for by reducing harvest elsewhere in the forest practice boundary. Implementation of an acceptable LWD placement plan can be used to make up for shortfalls due to roads.

Table 2-2 identifies the width of each zone within an RMZ in which Option 2 is implemented, given the stream width and site class of adjacent land.

Table 2-2. Option 2, Leaving Trees Closest to Water.

Site Class	RMZ Width (feet)	Core Zone Width[1/] (feet)	Inner Zone Width[2/]		Outer Zone Width[3/]	
			Stream Width ≤10'[4/] (feet)	Stream Width >10' [5/] (feet)	Stream Width <10'[1/] (feet)	Stream Width >10 (feet)
I	200	50	84[4/]	84[5/]	66	66
II	170	50	64[4/]	70[5/]	56	50
III	140	50	44[4/]	[6/]	46	[6/]

1/ Measured from bankfull width or edge of the Channel Migration Zone, if present.
2/ Measured from outer edge of core zone.
3/ Measured from outer edge of inner zone.
4/ Under Option 2, harvest is not permitted within 30 feet of the core zone for streams less than or equal to 10 feet wide.
5/ Under Option 2, harvest is not permitted within 50 feet of the core zone for streams greater than 10 feet wide.
6/ Option 2 is not permitted for Site Class III on streams greater than 10 feet wide.
≤ = less than or equal to
≥ = greater than or equal to
< = less than
> = greater than

Hardwood Conversion for Inner Zones. Landowners have the option of converting hardwood-dominated riparian stands to conifer-dominated stands in the inner zone of the RMZ in western Washington only. The riparian areas must be hardwood-dominated stands with evidence that conifers were dominant in the past. The objective of the hardwood conversion rule is to improve long-term riparian function by allowing landowners to remove most hardwoods in the conversion area and restock the area with conifers. There are numerous requirements and restrictions to implementing hardwood conversion. The following must apply for a landowner to obtain approval for hardwood conversion:

a) The combined core and inner zone do not meet stand target requirements.

b) There are fewer than 57 conifer trees 8 inches or larger in dbh per acre.

c) There are fewer than 100 conifer trees 4 inches or larger in dbh per acre.

d) Individual conversion areas are limited to 500 feet in length along a stream.

e) Landowners must own the land 500 feet above and below the harvest unit.

f) No stream adjacent parallel roads are present in the core or inner zone.

g) The landowner has performed post-harvest treatment to the satisfaction of the Washington DNR on previously converted hardwood-dominated stands.

Once hardwood conversion is approved, harvest is restricted by the following:

a) Conifer trees greater than 20 inches dbh shall not be harvested in the conversion area.

b) No more than 10 percent of the conifer trees greater than 8 inches dbh may be harvested.

c) The conversion area must be restocked with conifers and provided with post-harvest treatment to ensure conifer seedling survival.

The rule includes a component for tracking conversion rates on a watershed basis. The adaptive management program is charged with identifying adverse-effect thresholds for conversion levels on a watershed basis.

Outer Zone. Timber harvest in the outer zone must leave 20 riparian leave trees per acre after harvest. Riparian leave trees are trees that must be left after harvest in the outer zone in western Washington and are identified in Table 2-3. These trees must be left uncut throughout all future harvests.

The riparian leave trees must be left on the landscape according to one of the following two strategies. The third strategy is available to landowners who agree to an LWD placement plan.

a) Dispersal strategy. Riparian leave trees, which means conifer species with a dbh of 12 inches or greater, must be left dispersed approximately evenly throughout the outer zone.

b) Clumping strategy. Riparian leave trees must be left clumped in the following way: clump trees, with a dbh of 8 inches or greater, in or around sensitive features (primarily seeps and springs, forested wetlands, areas that would provide windthrow protection, small unstable slopes, or archaeological or historic sites) to the extent these are present in the outer zone. If sensitive features are not present, then clumps must be well distributed throughout the outer zone, and the leave trees must be at least 12 inches dbh in size.

Table 2-3. Outer Zone Riparian Leave Tree Requirements for Western Washington.

Application	Leave Tree Spacing	Tree Species	Minimum dbh Required
Outer zone	Dispersed	Conifer	12-inch dbh or greater
Outer zone	Clumped	Conifer	12-inch dbh or greater
Protection of sensitive features	Clumped	Trees representative of the overstory including both hardwood and conifer	8-inch dbh or greater

c) LWD in-channel placement strategy. A landowner may design an LWD placement plan in cooperation with WDFW. When an LWD placement plan is approved, the landowner may reduce the number of trees that have to be left in the outer zone to the extent provided in the approved LWD placement plan, but not below a minimum of 10 trees per acre (except for Channel Migration Zone credit).

The 20 riparian leave trees can be reduced in number in two situations: 1) if a landowner agrees to implement a placement strategy as described in the preceding paragraph, or 2) if trees are left in an associated Channel Migration Zone. In the latter case, the landowner may reduce the number of trees that have to be left according to specified rules (WAC 222-30-021*(1)(c)(iv)).

Western Washington—Type N Waters

In western Washington, two types of buffers are defined for Type N waters. First, an Equipment Limitation Zone is defined for all Type N waters. Second, a 50-foot-wide buffer is required for at least 50 percent of Type N perennial streams. These are described below.

Equipment Limitation Zones—Type N Waters. The area between the bankfull width edge of a Type N water and a line 30 feet from such an edge is established as an Equipment Limitation Zone. Landowners must mitigate for the disturbance of more than 10 percent of the soil within any Equipment Limitation Zone as a result of the use of ground-based equipment, skid trails, stream crossings (other then road crossings), or partially suspended cabled logs. A number of other rules designed to reduce soil disturbance, apply to cable yarding, skid trail location and construction, and other logging activities.

No-Harvest Buffers—Type N Perennial Waters. For Type N perennial streams, a 50-foot, no-harvest buffer is established along each side of the stream for at least 50 percent of the stream length. The locations for these buffers are to include a 500-foot length upstream from the junction of the Type N stream with a Type S or F stream and a specified area associated with sensitive sites (including soil zones perennially saturated from a headwall seep, a side-slope seep, a headwater spring of perennial flow for a Type N perennial water, an alluvial fan, or the point of intersection of two or more Type N perennial streams). If these sensitive sites do not add up to 50 percent of the stream, then the landowner must add buffers in specified priority areas. Additional acres equal to the number of acres occupied by an existing stream-adjacent parallel road within a specified sensitive site buffer or priority area must also be added. Landowners are also required to the extent reasonably practical, to avoid creating yarding corridors and road crossings through sensitive sites and to avoid soil compaction and vegetation removal in perennially moist areas.

Eastern Washington—Type S and F Waters

In eastern Washington, RMZs for Type S and F waters are also divided into three zones: the core zone is nearest to the water and adjacent to the bankfull width or Channel

Migration Zone outer edge, the inner zone is adjacent to the core zone, and the outer zone is adjacent to the inner zone and is farthest from the water (Figure 2-2).

Core Zone. The core zone in eastern Washington is 30 feet in width. With the exception of approved road crossings and yarding corridors, no timber harvest or construction is allowed in the core zone. Any trees cut for or damaged by yarding corridors must be left on site. Any trees cut as the result of road construction to cross a stream may be removed from the site, unless used as part of a LWD replacement strategy.

Inner Zone. The inner zone varies from 45 to 70 feet in width, depending on stream size and site class of adjacent lands. The degree of timber harvest permitted in the inner zone varies by habitat type. Three habitat types are defined for eastern Washington based on elevation: ponderosa pine (0 to 2,500 feet), mixed conifer (2,501 to 5,000 feet), and high elevation (greater than 5,000 feet) habitat types. Tables 2-4 and 2-5 present RMZ widths for eastern Washington areas.

Table 2-4. Eastern Washington RMZ Widths for Streams Less than or Equal to 15 Feet Wide.

Site Class	Total RMZ Width (feet)	Core Zone Width[1/] (feet)	Inner Zone Width (feet)	Outer Zone Width (feet)
I	130	30	45	55
II	110	30	45	35
III	90	30	45	15
IV	75	30	45	0
V	75	30	45	0

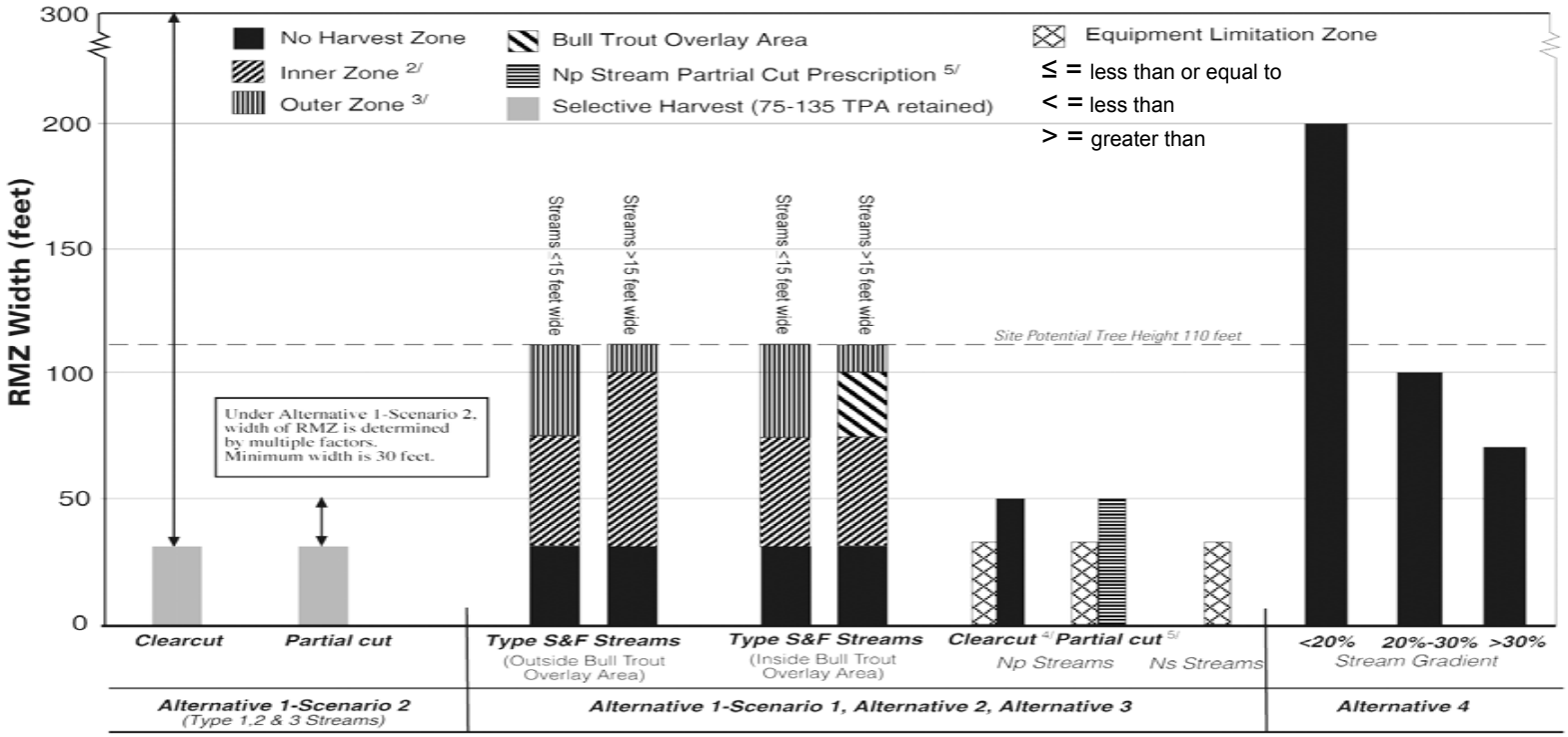
1/ Measured from bankfull width or edge of Channel Migration Zone, if present.

Table 2-5. Eastern Washington RMZ Widths for Streams Greater than 15 Feet Wide.

Site Class	Total RMZ Width (feet)	Core Zone Width[1/] (feet)	Inner Zone Width (feet)	Outer Zone Width (feet)
I	130	30	70	30
II	110	30	70	10
III	100	30	70	0
IV	100	30	70	0
V	100	30	70	0

1/ Measured from bankfull width or edge of Channel Migration Zone, if present.

Figure 2-2. Eastern Washington RMZ Characteristics by Alternative (using Site Class II, Site Potential Tree Height = 110 feet, as an example[1/]) (Note: Does not include Channel Mitigation Zone or Beaver Habitat Zone).



1/ Under No Action Alternative 1-Scenario 1, Alternative 2, and Alternative 3, total width of the RMZ varies by site class, ranging from 75 feet (Site Class V) to 130 feet (Site Class I). Note that the minimum RMZ width for streams greater than 15 feet wide is 100 feet.

2/ For Type S and F streams, the inner zone prescription requires leaving at least 50 trees per acre after harvest, of which 21 are the largest trees and 29 are at least 10 inches diameter breast height (dbh). If the resulting basal area is less than 90 feet^2/acre, then enough additional 10-inch-or-greater trees must be left to meet this target.

3/ For Type S and F streams, the outer zone prescription requires leaving 50 trees per acres, of which 15 are at least 20 inches dbh.

4/ Clearcut strategy may be implemented in no more than 30 percent of the stream reach in a harvest unit, and only if an equal area is designated as a no-harvest zone.

5/ For most Type Np streams in partial cut areas, the 10 largest trees per acre, plus as many additional trees greater than 6 inches dbh as will result in a basal area of at least 90 ft^2/acre, must be left.

Ponderosa Pine Habitat Type. No harvest within the inner zone is permitted unless the basal area of conifer and hardwoods is greater than 110 square feet per acre for trees greater than 6 inches dbh, or unless the basal area of conifer and hardwoods is less than 60 square feet per acre for trees greater than 6 inches dbh (Table 2-6).

Two other factors that must be considered relate to down wood and stream-adjacent parallel roads. At least 12 tons of down wood per acre must be left behind, with requirements on size. Also, when a stream-adjacent parallel road is present in the inner zone, and the minimum required basal area cannot be met due to the presence of the road, then inner zone harvest is restricted based on the stream size and the proximity of the road to the stream.

Mixed Conifer Habitat Type. No harvest is permitted within the inner zone unless the basal area of conifer and hardwoods for trees greater than 6 inches dbh is as follows:

- Greater than 110 or less than 70 square feet per acre on low site indexes (site index less than 90)
- Greater than 130 or less than 90 square feet per acre on medium site indexes (site index between 90 and 110)
- Greater than 150 or less than 110 square feet per acre on high site indexes (site index greater than 110)

If the basal area meets the requirements above, then harvest is permitted. Harvest must leave at least 50 trees per acre with at least a basal area of 70 square feet per acre on low site indexes, or 90 square feet per acre on medium site indexes, or 110 square feet per acre on high site indexes (Table 2-7). If basal area is below the minimum and there are more than 120 trees per acre, the stand can be thinned down to 120 trees per acre.

Table 2-6. Inner Zone Harvest Prescriptions for the Ponderosa Pine Habitat Type.

Inner Zone Basal Area and Trees per Acre (trees > 6 inch dbh)	Is Inner Zone Harvest Permitted ?	Prescription
<60 square feet/acre and <100 trees/acre	No	Not applicable.
<60 square feet/acre and >100 trees/acre	Yes	Leave at least 100 trees/acre; the 100 trees/acre must contain the 50 largest trees/acre; other restrictions on leave trees also apply.
>60 to 110 square feet/acre	No	Not applicable.
>110 square feet/acre	Yes	Leave at least 50 trees/acre and a basal area of at least 60 square feet/acre; the 50 trees/acre must contain the 21 largest trees/acre; other restrictions on leave trees also apply.

< = less than
> = greater than

Table 2-7. Inner Zone Harvest Prescriptions for the Mixed Conifer Habitat Type.

Site Index	Inner Zone Basal Area (trees >6 inch dbh)	Is Inner Zone Harvest Permitted ?	Prescription
Low (<90)	<70 square feet/acre and >120 trees/acre	Yes	Leave at least 120 trees/acre; the 120 trees/acre must contain the 50 largest trees/acre; other restrictions on leave trees also apply.
Low (<90)	70 to 110 square feet/ acre	No	Not applicable.
Low (<90)	>110 square feet/acre	Yes	Leave at least 50 trees/acre and a basal area of at least 70 square feet/acre; the 50 trees/acre must contain the 21 largest trees; other restrictions on leave trees also apply.
Medium (90-110)	<90 square feet/acre and >120 trees/acre	Yes	Leave at least 120 trees/acre; the 120 trees/acre must contain the 50 largest trees/acre; other restrictions on leave trees also apply.
Medium (90-110)	90 to 130 square feet/ acre	No	Not applicable.
Medium (90-110)	>130 square feet/acre	Yes	Leave at least 50 trees/acre and a basal area of at least 90 square feet/acre; the 50 trees/acre must contain the 21 largest trees; other restrictions on leave trees also apply.
High (>110)	<110 square feet/acre and >120 trees/acre	Yes	Leave at least 120 trees/acre; the 120 trees/acre must contain the 50 largest trees/acre; other restrictions on leave trees also apply.
High (>110)	110 to 150 square feet/acre	No	Not applicable.
High (>110)	>150 square feet/acre	Yes	Leave at least 50 trees/acre and a basal area of at least 110 square feet/acre; the 50 trees/acre must contain the 21 largest trees; other restrictions on leave trees also apply.

< = less than
> = greater than

Two other factors that must be considered relate to down wood and stream-adjacent parallel roads. At least 20 tons of down wood per acre must be left behind, with requirements on size. Also, when a stream-adjacent parallel road is present in the inner zone, and the minimum required basal area cannot be met due to the presence of the road, then inner zone harvest is restricted based on the stream size and the proximity of the road to the stream.

High Elevation Habitat Type. Restrictions on harvest within the inner zone for RMZs in eastern Washington high elevation habitat types are as defined for western Washington RMZs. However, only Option 1 is permitted because the narrower core and inner zone widths in eastern Washington do not make Option 2 feasible.

Two other factors that must be considered relate to down wood and stream-adjacent parallel roads. At least 30 tons of down wood per acre must be left behind, with restrictions on size. Also, when a stream-adjacent parallel road is present in the inner zone, and the minimum required basal area cannot be met due to the presence of the road, then inner zone harvest is restricted based on the stream size and the proximity of the road to the stream.

Wildlife Reserve Trees. All wildlife reserve trees are to be retained in the inner zone, providing they are not a safety hazard. Live wildlife reserve trees can count towards leave tree requirements.

Outer Zone. This zone has three categories based on timber habitat type: Ponderosa pine, mixed conifer, and high elevation. The width of this zone is 0 to 55 feet depending on the site class and stream width.

Tree counts that must be left per acre, regardless of the presence of an existing stream-adjacent parallel road in the zone, are as follows:

- Ponderosa pine habitat type—10 dominant or co-dominant trees.
- Mixed conifer habitat type—15 dominant or co-dominant trees.
- High elevation habitat type—See requirements for western Washington Type S and F waters.

An additional restriction for trees in the high elevation habitat type is that they must be left on the landscape according to one of two strategies: dispersal or clumping strategies.

Eastern Washington—Type N Waters

In eastern Washington, buffer zones for Type N waters are defined in two ways. First, an Equipment Limitation Zone is defined for all Type N waters. Second, a buffer is required for Type N perennial streams. These are described below.

Equipment Limitation Zones—Type N Waters. The area between the bankfull width edge of a Type N water and a line 30 feet from such edge is established as an Equipment Limitation Zone. Landowners must mitigate for the disturbance of more than 10 percent of the soil within any Equipment Limitation Zone as a result of the use of ground-based equipment, skid trails, stream crossings (other than road crossings), or partially suspended cabled logs.

Buffers—Type N Perennial Waters. For Type N perennial streams, within 50 feet of the bankfull width, the landowner must identify either a partial cut and/or clearcut strategy for each unit to be harvested as follows:

- For partial cuts—Basal areas must meet the timber-type-dependent basal areas required for the eastern Washington RMZ inner zone. The trees to be included in the basal area determination and left after harvest must include the 10 largest trees per acre, an additional 40 trees must be greater than or equal to 10 inches dbh or must be

the largest of the remaining trees, and the other remaining 50 trees also have size and other restrictions.

- For clearcuts—The streamside boundary of the clearcut must not exceed 30 percent of the total stream reach in the harvest unit, must not exceed 300 continuous feet in length, must not be located within 500 feet of the intersection of a Type S or F water, and must not occur within 50 feet of a defined sensitive site. Also, the landowner must simultaneously designate a no-harvest zone buffer that is equal in area to the clearcut portion of the stream reach in the harvest unit.

Additionally, if a road exists in an RMZ for Type N perennial water and the basal area required to be left cannot be met within 50 feet of the stream due to the presence of the road, then the shortfall of basal area has to be eliminated by shifting the RMZ location according to specified rules.

Riparian Management Zones for Exempt 20-acre Parcels

Landowners with parcels of 20 contiguous acres or less, and with total statewide parcel ownership of less than 80 forested acres, may choose to leave a different riparian buffer than what is described above (i.e., "80/20 category"). The Washington State Legislature found that increasing regulatory requirements continue to diminish the economic viability of small forest landowners. As a result of this finding, the Legislature passed HB 2091 in 1999 that included the following exemption for landowners who fit the 80/20 category explained above. These landowners are subject to the RMZ rules and Watershed Analysis prescriptions in effect on January 1, 1999, plus an additional 15 percent volume requirement where Watershed Analysis prescriptions are not in effect. Western Washington landowners in this 80/20 acre category are required to meet the shade rule (WAC 222-30-040) in effect on January 1, 1999. Eastern Washington landowners in this 80/20 acre category must abide by the shade rule revised during the forests and fish negotiations and effective on July 1, 2000. The shade rule requires landowners to leave vegetation along streams to maintain water temperature. The revised shade rule requires landowners in eastern Washington to retain all available shade within 75 feet from the edge of the bankfull width or the outer edge of the Channel Migration Zone (if present) within the bull trout overlay. The bull trout overlay refers to those portions of eastern Washington streams containing bull trout habitat as identified on the WDFW's bull trout map.

Western Washington RMZs for Exempt 20-acre Parcels. RMZs are measured from the bankfull width of a Type S or F water and extend to the line where vegetation changes from wetland to upland plant community or the line required to leave sufficient shade, whichever is greater. RMZs must be at least 29 feet wide. The maximum widths used to calculate average buffer widths are shown in Table 2-8. The RMZ width is expanded as necessary to include wetlands or ponds adjacent to the stream.

Within the RMZ, trees are to be left for wildlife and fisheries habitat, as provided for in Table 2-8. Fifty percent or more of the trees are to be live and undamaged on completion

Table 2-8. Western Washington Riparian Leave Tree Requirements for Exempt 20-acre Parcels.

Water Type/ Average Width	RMZ Maximum Width (feet)	Ratio of Conifer to Deciduous/Minimum Size Leave Trees	Number Trees/1,000 Feet Each Side	
			Gravel/Cobble <10" Diameter (trees)	Boulder/ Bedrock[2/] (trees)
Types S and F water 75 feet and over	115	Representative of stand	58	29
Types S and F water under 75 feet	86	Representative of stand	115	60
Type F water 5 feet and over	58	2 to 1/12 inches or next largest available[1/]	86	29
Type F water less than 5 feet	29	1 to 1/6 inches or next largest available[1/]	29	29

1/ "Or next largest available" requires that the next largest trees to those specified in the rule be left standing when those available are smaller than the sizes specified.
2/ Ponds or lakes that are Type S or F waters shall have the same leave tree requirements as boulder/bedrock streams.
< = less than

of the harvest. The leave trees are to be randomly distributed where feasible; some clumping is allowed to accommodate operational considerations.

An average of five undisturbed and uncut wildlife trees per acre are to be left at the ratio of one deciduous tree to one conifer tree equal in size to the largest existing trees of those species within the zone. Where the one-to-one ratio is not possible, the landowner will substitute either species present. Forty percent or more of the leave trees shall be live and undamaged on completion of harvest. Trees left according to this requirement may be included in the number of required leave trees in Table 2-8.

For clearcuts of 20 acres or less, if the area in RMZs for Type S or F waters or Wetland Management Zones, considered together, comprises 10 percent or more of the harvest unit, then not less than 50 percent of the trees required in Table 2-8 is to be left.

Eastern Washington RMZs for Exempt 20-acre Parcels. RMZs are measured the same as for western Washington except the minimum and the maximum widths are as described below, provided that the RMZ width is to be expanded as necessary. Within the RMZ, trees are to be left for wildlife and fisheries habitat (See below). The condition of the trees and their distribution are to follow the requirements for western Washington.

The width of the RMZ is based on the adjacent harvest type as follows:

- Partial cutting—The RMZ width ranges from 35 to 58 feet on each side of the stream.
- Other harvest types—The RMZ width is an average 58 feet and ranges from 35 to 345 feet on each side of the stream.

Specific leave-tree requirements within the RMZ of Type S or F waters include the following: a) leave all trees 12 inches or less dbh, b) leave 18 live conifer trees between 12 inches and 20 inches dbh per acre, and c) a number of other specific leave-tree

requirements. The minimum total leave-tree requirements per acre for Type S and F waters are as follows:

a) On streams with a boulder/bedrock bed, the minimum leave tree requirement is 75 trees/acre, 4 inches dbh or larger.
b) On streams with a gravel/cobble (less than 10 inches in diameter) bed, the minimum leave-tree requirement is 155 trees/acre, 4 inches dbh or larger.
c) On lakes or ponds, the minimum leave-tree requirement is 86 trees/acre, 4 inches dbh or larger.

Finally, for harvest units of 20 acres or less, if the area in RMZs for Type S or F waters or Wetland Management Zones, considered together, comprises 10 percent or more of the harvest unit, then not less than 50 percent of the trees required above is to be left.

Riparian Leave Trees for Type N Waters on Exempt 20-acre Parcels. Trees are to be left along Type N perennial waters where such practices are necessary to protect public resources. Where such practices are necessary, at least 29 conifer or deciduous trees, 6 inches dbh or larger, are to be left on each side of every 1,000 feet of stream length within 29 feet of the stream. The leave trees may be arranged to accommodate the specific forest operation.

Shade Requirements to Maintain Water Temperature

Determination of Adequate Shade. The method described below is to be used to determine appropriate shade levels for Type S and F waters within 75 feet of the bankfull width or Channel Migration Zone of the stream (if present) to prevent excessive water temperatures, which may have detrimental impacts on aquatic resources.

Within the bull trout overlay (WAC 222-16-010), all available shade will be retained within 75 feet of bankfull width or Channel Migration Zone of the stream. The bull trout overlay is a map of those portions of eastern Washington streams containing bull trout habitat as identified on the WDFW's bull trout map (WAC 222-16-010).

Temperature Prediction Method. In addition to the RMZ requirements, leave trees are retained in RMZs on Type S and F waters as provided by a specified method as described in the Forest Practices Board Manual (1995), which includes the following considerations:

a) Minimum shade retention requirements
b) Regional water temperature characteristics
c) Elevation
d) Temperature criteria defined for stream classes in WAC 173-201A

Leave-tree Requirements for Shade. The method described above is used to establish the minimum required shade cover based on site-specific characteristics. When site-specific data indicate that pre-harvest conditions do not meet the minimums established by the method, no additional shade removal from RMZs is allowed.

No tree may be harvested within 75 feet from the edge of the bankfull width or the outer edge of the Channel Migration Zone (whichever is greater) of any Type S or F water if, according to the temperature prediction method, the tree is providing shade to the typed water. These shade requirements must be satisfied whether or not the inner zone includes a stream-adjacent parallel road. However, harvest of shade trees in connection with the construction and maintenance of road crossings or the creation and use of yarding corridors may occur within certain guidelines. These guidelines include restricting the number, spacing and width of such corridors, and avoidance of environmentally sensitive areas to the extent possible.

Logging within RMZs

Salvage logging (See Glossary) within an RMZ is based upon the zone (core, inner, or outer) in which the tree was originally located, applicable riparian stand requirements, and the extent of previous harvest activities in the zone.

Salvage Logging within the Bankfull Width of any Typed Water. No salvage may take place within the bankfull width of any typed water.

Salvage Logging in a Core Zone or Channel Migration Zone. No salvage may take place within the RMZ core zone or a Channel Migration Zone, including any portion of those trees that may have fallen outside of these zones.

Salvage Logging in the Inner Zone. Salvage may not take place within the inner zone if the stand target requirements cannot be met by the residual stand. If the proposed salvage involves down tree(s) that originated from the inner zone, salvage of down wood may only be permitted if the down wood was not needed to meet stand target requirements in the inner zone. Salvage of any existing down wood may not take place if the remaining balance of down wood is insufficient to meet the regional down wood guidelines in Tables 2-9 and 2-10. Salvage within the inner zone must be conducted to protect residual undamaged trees.

Table 2-9. Down Wood Guidelines for Salvage Logging in Western Washington and Eastern Washington High Elevation Habitat Type RMZ Inner Zones.

Structural Class I and II (Scale I-III)	Greater than 1-foot Diameter	1- to 2-foot Diameter	Greater than 2-foot Diameter	Total
Number of logs/acre	85	83	26	194

Table 2-10. Down Wood Requirements for all Timber Harvest in Eastern Washington RMZ Inner Zones.

Habitat Type	Down Wood Requirements
Ponderosa Pine	Leave at least 12 tons/acre of down wood, including at least six pieces >16 inches in diameter and 20 feet long, and four pieces >6 inches diameter and 20 feet long.
Mixed Conifer	Leave at least 20 tons/acre of down wood, including at least eight pieces >16 inches in diameter and 20 feet long, and eight pieces >6 inches in diameter and 20 feet long.
High Elevation	Leave at least 30 tons/acre of down wood, including at least eight pieces >16 inches in diameter and 20 feet long, and eight pieces >6 inches in diameter and 20 feet long.

> = greater than

Salvage Logging in the Outer Zone. Salvage may not take place within the outer zone if the leave-tree requirements cannot be met by the residual stand. If the proposed salvage involves down trees that originated from the outer zone, salvage may only be permitted if the down wood was not needed to meet leave-tree requirements in the outer zone.

Cable Yarding

No timber is to be cable-yarded in or across Type S or F waters except where the logs will not materially damage the bed of waters, banks, or RMZs. Currently, a hydraulics project approval is required from WDFW for aerial yarding above streams. Yarding corridors must be no wider or more numerous than necessary to accommodate safe and efficient transport of logs. Generally, yarding corridors must be located no closer to each other than 150 feet and must be no wider than 30 feet. Additional specifications on yarding are also required.

Wetlands

Under No Action Alternative 1-Scenario 1, the wetlands rules would be the same as the current rules. Landowners would be required to map all forested wetlands that are 3 or more acres in size. Further, they would have to identify and map all forested wetlands and non-forested (Type A and B) wetlands where more than 0.1 acre of such wetlands would be impacted by filling, and where mitigation for such filling is required. They would also have to identify and map all forested wetlands within RMZs, regardless of size, unless entry into the RMZ is not proposed. Filling or draining more than 0.5 acre of any individual wetland (forested or non-forested) would require replacement by substitution or enhancement of the lost wetland function. Replacement would generally be on a two-for-one basis. Construction and maintenance of roads is evaluated with a goal of "no net loss" of wetland function across the landscape (Washington Forest Practices Board Manual 2001b, Section 9).

Hydrology

Under No Action Alternative 1-Scenario 1, the hydrology-related rules would be the same as the current rules. Under these rules, Washington DNR can condition the size of a

clearcut in the significant rain-on-snow zone of a watershed (which has not undergone Watershed Analysis) where peak flows have resulted in material damages to public resources (WAC 222-22-100*(2)). Also, hydrology-related research and monitoring are a primary focus of the current adaptive management program. However, limited participation in adaptive management under No Action Alternative 1-Scenario 1 would also limit this research and monitoring (See the following subsection on Adaptive Management).

Forest Pesticides

The current rules would continue in effect under No Action Alternative 1-Scenario 1. One of the main goals of these rules, with respect to application of forest pesticides, is to ensure that use of pesticides is managed to meet water quality standards and label requirements and to avoid harm to riparian vegetation. Zero drift and zero entry of aerially applied forest pesticides into water are the goals under this alternative; therefore, the rules and Forest Practices Board Manual would be amended to implement Best Management Practices (BMPs) designed to: 1) eliminate direct entry of pesticides into streams, while minimizing off-target drift, and 2) minimize entry of pesticides into riparian zones that would cause significant damage to riparian vegetation. Under this alternative, no pesticides would be applied, regardless of application method, within the core zone of any Type S or F waters, unless specifically required for hardwood or noxious weed control. Aerial application of pesticides would also be prohibited within the inner zones of Type S or F waters and within Wetland Management Zones. For Type N waters and Type B wetlands less than 5 acres in size, aerial application of pesticides would be prohibited within variable-width buffers, depending on specific wind conditions and application nozzle types. Ground application of pesticides with power equipment would be prohibited within 25 feet of any non-forested wetland or surface water, excluding dry stream segments at the time of application. Also, hand-applied pesticides would only be used on specific targets. Application of all pesticides (whether hand applied or not) would be prohibited within bankfull widths and Channel Migration Zones unless necessary to meet requirements for noxious weed control.

Unstable Slopes

Under No Action Alternative 1-Scenario 1, rules pertaining to unstable slopes would be the same as those included in the current rules. Unstable slopes are specifically defined by slope gradient and geomorphic feature (i.e., convergent headwalls, inner gorges, bedrock hollows, toes of deep seated landslides, groundwater recharge areas for glacial deep-seated landslides, outer edge of a meander bend along a valley wall, or a high terrace in a Channel Migration Zone). After a forest practices application is submitted and unstable slope screens are applied, field verification of unstable slopes by a Washington DNR forester may be needed. An interdisciplinary team of stakeholders may also be formed as needed. If the application is a Class IV-Special forest practice due to unstable slopes, the landowner must submit a geotechnical evaluation prepared by a qualified expert. The application is a Class IV-Special when the high hazard unstable slope has the potential to deliver sediment to a public resource or to threaten public safety. Class IV forest practices

applications go through the SEPA process; therefore, SEPA requirements would have to be fulfilled for the application to be approved.

Additional high hazard areas in certain regions of the State would be identified in the future and included in the high hazard landform list to be identified in forest practices applications. Moderate hazard landforms and appropriate management guidelines for forest practices on those landforms would be developed.

Forest Roads

The current rules pertaining to forest roads would remain in effect under No Action Alternative 1-Scenario 1. Forest road management, design, and construction would continue to rely on prescriptive standards and additional performance-based standards with mandatory road maintenance plans to better protect water quality and riparian habitat. The current Washington Forest Practices Rules provide standards and BMPs that are intended to help landowners design and maintain roads that do not result in delivery of sediment and surface water to streams. These rules are designed to meet this policy objective and include the following requirements on road location and design and road and landing construction:

- Improved standards on Type 4 and Type 5 stream crossings. Future improvements in standards for Type 4 and Type 5 stream crossings developed jointly between the adaptive management program and WDFW have the goal of being sufficiently protective to eventually eliminate the need for a Hydraulic Project Approval.
- Culverts must be designed or replaced (if necessary to protect public resources) to pass a 100-year flood, with consideration for the passage of debris likely to be encountered.
- Closer spacing of ditch relief culverts to minimize runoff to streams.
- Required erosion control for new roads where there is a potential for soil to enter a stream.
- No sidecast construction within the 100-year floodplain.

In addition, road maintenance and abandonment plans (WAC 222-24-050 through 222-24-052) would be required for large landowners. These landowners would have 5 years to produce road maintenance and abandonment plans for their entire ownership. Road maintenance and abandonment identified in the plans must be accomplished by 2016 on large landowner properties. The road maintenance and abandonment plans are intended to repair and/or maintain fish passage (e.g., culverts, bridges), reduce sediment-laden road drainage, reduce potential mass wasting of roads, and improve hydrologic continuity. Sites would be prioritized for repair based on the road assessment, fixing the worst problems first. As part of the road maintenance and abandonment plans, landowners would submit standard road practices; pre-storm planning, emergency and post-storm restoration practices; an inventory of risk to public resources; and a detailed work plan.

Small forest landowners, as defined by WAC 222-24-051*(1) for purposes of completing road maintenance and abandonment plans, are also responsible for road maintenance and must submit a roads maintenance and abandonment checklist for each forest practices

application, instead of a full road maintenance and abandonment plan. All forest roads would be maintained to prevent potential or actual damage to public resources. Fish passage would be addressed by December 2016.

Large landowners would need to complete an inventory and assessment of orphan roads (WAC 222-24-052(4)) by 2006. Small landowner information on orphan roads would become available as the landowners submit forest practices applications with their road maintenance and abandonment checklists. Orphan roads are roads that were constructed prior to 1974 and not used since 1974 for forest practices. Following the assessment, an evaluation would be conducted to determine if repairs and abandonment of orphan roads should occur. The question of whether it would be necessary to request public funding for repairs and abandonment of orphan roads would also be considered.

Watershed Analysis

Watershed Analysis prescriptions (WAC Chapter 222-22) were developed because the Forest Practices Board acknowledged that public resources might be adversely affected by the interaction of multiple forest practices occurring within a given watershed. The purpose of Watershed Analysis is to address these cumulative effects of forest practices on the public resources of fish, water, and capital improvements of the State or its political subdivisions. The long-term objective of Watershed Analysis is to protect and restore these public resources and the productive capacity of fish habitat adversely affected by forest practices while maintaining a viable forest products industry. Watershed Analysis includes landscape-level prescriptions designed to protect and allow the recovery of public resources through regulations, both voluntary and mandatory, while also allowing for monitoring, subsequent watershed analyses, and adaptive management.

Watershed Analysis under No Action Alternative 1-Scenario 1 would the same as under the current rules. It would be voluntary for private landowners and mandatory for the State (Washington DNR), dependent upon available funding. A number of changes to the Watershed Analysis process, in effect on January 1, 1999, have occurred as follows:

- Two new modules are being added to the Watershed Analysis process: cultural resources and stream restoration.
- Resource assessments are still required for all current modules, but no prescription process (plan designed to minimize, prevent, or avoid adverse change to resources; WAC 222-22-050 through 222-22-070) is required for riparian function, mass wasting, and surface erosion (roads); however, the mass wasting and surface erosion prescriptions are to be phased out only after unstable slopes are mapped in each basin, and road maintenance and abandonment plans are completed by landowners.
- SEPA analysis on a non-project basis is required for all watershed analyses.
- Any landowner within a Watershed Administrative Unit (WAC 222-22-020) is allowed to apply for a multi-year permit to conduct forest practices according to the Watershed Analysis prescriptions. When a 5-year review is conducted the landowners update the current multi-year permit by including any prescription changes within 30

days of completion of the 5-year review of the assessment and prescriptions. If necessary, the proposed forest practices under the permit are to be modified to comply with the new prescriptions.

- For water quality, improvements are to be made so that water quality meets Clean Water Act requirements, with particular emphasis on water temperature.
- If a road maintenance and abandonment plan has not been developed for a landowner within a Watershed Administrative Unit, then the Watershed Analysis surface erosion resource assessment will provide information for the development of such a plan. If a road maintenance and abandonment plan has been developed, however, then Watershed Analysis will incorporate the plan, but no new prescriptions will be developed.

Cultural Resources

Under No Action Alternative 1-Scenario 1, the degree of protection provided for cultural resources is in the process of being increased from the rules in effect on January 1, 1999, both directly and indirectly, through cultural resource program changes. The FFR, which underlies the State's FPHCP, directs the development and implementation of both a cultural resources plan and a cultural resources module in Watershed Analysis.

In response to the cultural resource planning, protection, and management commitments in the FFR (Appendices G, N, O) and the 1987 TFW Agreement, the TFW Cultural Resources Committee (comprised of Tribes, timber landowner associations, the Washington DNR, and the Office of Archaeology and Historic Preservation) collaboratively developed a Cultural Resources Protection and Management Plan and a module and rules for cultural resources in Watershed Analysis. The cultural plan was reviewed and endorsed by the Forests and Fish Policy group, and a new module was recommended through the Adaptive Management Program for Forest Practices Board approval as part of its Board Manual on Watershed Analysis (i.e., Watershed Analysis Section 11). An associated rule package was also recommended. The rule package primarily modifies WAC 222-22, which governs the conduct of Watershed Analysis. The Board initiated rulemaking on the negotiated package in August 2003.

Adaptive Management

Adaptive management is a structured process for examining alternative management strategies for meeting measurable biological goals and objectives, and then if necessary, adjusting future conservation management actions based on what is learned as a result of continued research and monitoring. Under No Action Alternative 1-Scenario 1, the current adaptive management program would continue to be required by statute and the rules, as described in WAC 222-12-045 and summarized under subsection 2.3.2.2 (Alternative 2, Washington Forest Practices Rules and Program – Specific Description) (See also subsection 1.3.1.2, The Forests and Fish Report). However, functionally the program would be reduced. This reduction in functionality would be in the form of decreased participation by stakeholders, and a reduction in public funding for implementation. The regulatory stability afforded by receiving ESA take authorization is a

primary incentive for landowners to support and participate in the program. Additionally, broad stakeholder support for the program results in the State being able to compete favorably for funding to support implementation. A breakdown in broad stakeholder support would weaken the State's ability to compete favorably for funding; carrying out research and monitoring activities with less funding and fewer people participating would reduce the effectiveness of the program. Currently, the Cooperative Monitoring, Evaluation, and Research (CMER) Committee has high priority research and monitoring projects identified, and work is underway in several areas. Under No Action Alternative 1-Scenario 1, a re-prioritization would be necessary, and many projects would probably be delayed or not conducted. A reasonable assumption is that only the highest priority effectiveness and validation projects and/or rule tool projects would be conducted, and the timeline for completion would be extended.

No Action Alternative 1-Scenario 2

No Action Alternative 1-Scenario 2 assumes that the Washington State Legislature would allow the Forest Practices Board to repeal the current Washington Forest Practices Rules that resulted from the FFR and adopt the specific Washington Forest Practices Rules that were in effect on January 1, 1999.

Water Typing

Under No Action Alternative 1-Scenario 2, the water typing rules could revert back to the rules in effect on January 1, 1999 (1998 WAC 222-16-030). Five water types are recognized as follows:

- Type 1—Major waterways of the State including rivers, lakes, and saltwater. They include all waters inventoried as "shorelines of the State" (RCW Chapter 90.58).
- Type 2—Waters, not classified as Type 1, which have high fish, wildlife, or human use. They generally are streams wider than 20 feet (measured between the ordinary high water marks), with a gradient of less than 4 percent.
- Type 3—Waters, not classified as Types 1 or 2, which have moderate to slight fish, wildlife, or human use. They generally are less than 20 feet and greater than 5 feet wide, with a gradient of less than 12 percent.
- Type 4—Waters not classified as Types 1, 2, or 3, which are important for protecting downstream water quality. They generally are streams wider than 2 feet and less than 5 feet.
- Type 5—Waters not classified as Types 1, 2, 3, or 4. They are generally seasonal headwater streams, less than 2 feet wide.

Riparian Habitat

Under No Action Alternative 1-Scenario 2, RMZs would be prescribed along Type 1, 2, and 3 streams (1998 WAC 222-30). These zones are measured horizontally from the ordinary high-water mark. They are different in western Washington and in eastern Washington. Harvest is limited within RMZs; leave trees for wildlife and fisheries habitat are required and left unharvested as prescribed below.

The number, size, species, and ratio of leave trees (conifer to deciduous) is determined by the water type, stream width, and the bed material. Leave trees are, generally, to be evenly distributed with some clumping. Although the rules seek to minimize the location of new roads in riparian areas, the presence of stream-adjacent parallel roads in the RMZs does not affect RMZ widths or leave-tree requirements.

In addition to the RMZ requirements identified in this section, Type 1 waters designated as "Shorelines of Statewide Significance" are given additional protection under the Shoreline Management Act. Restrictions under the Act are implemented and enforced at the county level and include establishment of a 200-foot Shoreline Management Zone, measured from the ordinary high water mark along Shorelines of Statewide Significance. Typically, a landowner may remove no more than 30 percent of the available merchantable trees within the Shoreline Management Zone every 10 years, using a selective harvest strategy, unless either local government or Ecology grants prior approval.

Western Washington RMZs

In western Washington, the outer edge of an RMZ is defined as the line where vegetation changes from a wetland to an upland plant community, or the line required to leave sufficient shade (See section below), whichever is greater, but no less than 25 feet wide, nor more than the maximum widths defined in Table 2-11. RMZ widths are to be expanded as necessary to include wetlands or ponds adjacent to the stream. In addition to the leave-tree requirements in Table 2-11, an average of five of the largest trees per acre (at the ratio of one coniferous to one deciduous tree) would be left within the zone for wildlife habitat.

Table 2-11. Western Washington RMZ Widths and Leave Tree Requirements (No Action Alternative 1-Scenario 2).

Water Type and Average Width	RMZ Minimum and Maximum Widths	Ratio of Conifer to Deciduous Trees and Minimize Size of Leave Trees	Number Trees / 1,000 Feet Each Side	
			Gravel or Cobble <10" Diameter	Boulder or Bedrock
Type 1 and 2 water 75 feet and over	25 to 100 feet	Representative of stand	50 trees	25 trees
Type 1 and 2 water less than 75 feet	25 to 75 feet	Representative of stand	100 trees	50 trees
Type 3 water 5 feet and over	25 to 50 feet	2 to 1 ratio 12 inches or next largest available	75 trees	25 trees
Type 3 water less than 5 feet	25 feet	1 to 1 ratio 6 inches or next largest available	25 trees	25 trees

1/ "Or next largest available" requires that the next largest trees to those specified in the rule be left standing when those available are smaller than the sizes specified.
< = less than

RMZs are not required along Type 4 and 5 waters. However, riparian leave-tree areas are sometimes required along Type 4 waters where such practice is necessary to protect public resources. In these cases, 25 conifer or deciduous trees, at least 6 inches dbh, would be left within 25 feet of each side of the stream per 1,000 feet of stream length. Western Washington RMZ widths and the degree of protection provided are compared by alternative in Figure 2-1.

Eastern Washington RMZs

In eastern Washington, the outer edge of an RMZ is defined as the line where vegetation changes from a wetland to an upland plant community, or the line required to leave sufficient shade (as defined in the section below), whichever is greater, but no less than 30 feet wide, nor more than the maximum widths defined in Table 2-12. RMZ widths would be expanded as necessary to include wetlands or ponds adjacent to the stream.

RMZs would not be required along Type 4 and 5 waters. However, under special circumstances, riparian leave-tree areas would be required, as described for western Washington RMZs. Eastern Washington RMZ widths and the degree of protection provided are compared by alternative in Figure 2-2.

Sufficient Shade

Sufficient shade is defined by graphs found in Section 1 of the Forest Practices Board Manual (Washington Forest Practices Board 1998, Section 1). The graphs define a minimum percent canopy cover that must be maintained if harvest is to take place within the RMZ. The minimum shade required is based on the State water quality standards and the probability of achieving them at different elevations.

Retention of Wildlife Leave Trees and Down Logs

In addition to the leave-tree requirements associated with RMZs and shade defined above, a minimum of two to three wildlife reserve trees per acre, two green recruitment trees per acre, and two down logs per acre must be left throughout each harvest unit.

Table 2-12. Eastern Washington RMZ Widths and Leave Tree Requirements (No Action Alternative 1-Scenario 2).

Harvest Type	RMZ Minimum and Maximum Widths	Number Trees/Acre 4-inch dbh or Larger		Additional Requirements
		Gravel or Cobble <10" Diameter	Boulder or Bedrock	
Partial Cutting	30 to 50 feet	135 trees	75 trees	• 16 conifers 12 to 20 inches dbh/acre • 3 conifers >20 inches dbh/acre • 3 deciduous trees 12 to 16 inches dbh/acre • 2 deciduous trees >16 inches dbh/acre • Leave all trees 12 inches dbh and smaller
Even-Aged	30 to 300 feet			

< = less than
> = greater than

Salvage Logging within RMZs

No specific restrictions on salvage logging in RMZs are included under No Action Alternative 1-Scenario 2.

Cable Yarding

No timber is to be cable-yarded in or across Type 1, 2, or 3 waters, except where the logs will not materially damage the bed of waters, banks, or RMZs, and the removal has a Hydraulic Project Approval from WDFW.

Wetlands

Under No Action Alternative 1-Scenario 2 (1998 WAC 222-3-020*(6) and*(7)), two categories of wetlands are defined: forested and non-forested. Non-forested wetlands are subdivided into two types: Type A and Type B. Type A wetlands are those with open water and include non-forested wetlands that are greater than 0.5 acre in size and bogs or fens (that may be forested) greater than 0.25 acre in size. Type B wetlands are mostly vegetated, non-forested wetlands greater than 0.5 acre in size. Both types of wetlands require the establishment of variable-width Wetland Management Zones ranging from 25 to 200 feet. In contrast, forested wetlands receive less protection than non-forested wetlands. Wetland Management Zones are not established on forested wetlands; however, harvest methods are limited to low-impact harvest or cable systems. Road and landing construction within either forest or non-forested wetlands requires following a specific mitigation sequence.

Hydrology

Under No Action Alternative 1-Scenario 2, the hydrology-related rules would be the same as the current rules. Under these rules, Washington DNR can condition the size of a clearcut in the significant rain-on-snow zone of a watershed (which has not undergone Watershed Analysis) where peak flows have resulted in material damages to public resources (1998 WAC 222-22-100*(2)). Hydrology-related research and monitoring would be limited or not conducted at all for the purpose of adaptive management.

Forest Pesticides

Pesticide rules (1998 WAC 222-38) under No Action Alternative 1-Scenario 2 would primarily regulate the handling, storage, and application of pesticides to prevent impacts to public health, lands, fish, wildlife, aquatic habitat, and water quality. These rules would be consistent with Washington State Department of Agriculture regulations. Several other laws and regulations apply to the conduct of forest practices (1998 WAC 222-50), some of which are administered by other agencies and may require permits from such agencies prior to the conduct of certain forest practices.

Under No Action Alternative 1-Scenario 2, pesticides could not be applied within 200 feet of residences or within 100 feet of other properties (e.g., farmland). In addition, pesticides could not be ground-applied with power equipment within 25 feet of all non-forested wetlands, as well as all other typed waters, excluding Type 4 and 5 waters with no surface water. Pesticides could be aerially applied within a 50-foot buffer established on all typed

waters, excluding Type 4 and 5 waters with no surface water and other areas of open water, such as ponds or sloughs. Pesticides could be used in either RMZs or Wetland Management Zones; however, they would need to be applied by hand. Direct entry of pesticides into any typed waters, except segments of Type 4 and 5 waters with no surface water, would be prohibited.

Unstable Slopes

Under No Action Alternative 1-Scenario 2, unstable slopes are reviewed as part of the forest practices application. Unstable areas are defined as slide prone areas. Slide prone areas are determined by Washington DNR and are generally defined as excessively steep or unstable soils. Washington DNR determines whether slopes are unstable using available soils information, from evidence of geologically recent slumps or slides, where the natural slope exceeds the angle of repose for the particular soil types present, or where springs or seeps may indicate unstable conditions are present. If the unstable slope has the potential to deliver sediment to a public water body, the application would be processed as a Class IV-Special and becomes subject to SEPA rules (1998 WAC 222-16-050 (1)*(d) and*(e)) (subsection 1.4.1, Scoping and the Relevant Issues, *Scoping*).

Forest Roads

Under No Action Alternative 1-Scenario 2, road maintenance and road construction standards would be the same as those rules in effect on January 1, 1999 (1998 WAC 222-24). The rules in effect on January 1, 1999 required cross drain culverts at less frequent intervals than at present and fill and sidecast placement restrictions were above at the 50-year flood level not the revised 100-year flood level. Minimum size requirements for culverts installed at stream crossings in rules in effect on January 1, 1999 were smaller than size requirements in the Washington Forest Practices Rules that became effective on March 20, 2000. Road maintenance and abandonment plans would only be required based on Watershed Analysis prescriptions or Washington DNR request.

Watershed Analysis

Under No Action Alternative 1-Scenario 2, Watershed Analysis is voluntary for private landowners, but is required to be conducted by the Washington DNR on all watersheds of the State, as funding allows (1998 WAC 222-22). The Watershed Analysis process is based on the Washington Forest Practices Board Manual: Standard Methodology for Conducting Watershed Analysis (Washington Forest Practices Board 1994). The Watershed Analysis Manual is available on-line at: http://www.dnr.wa.gov/forestpractices/watershedanalysis/manual/.

This manual was created by a consortium of individuals associated with the TFW process and supervised by TFW's CMER Committee. Nine resource assessments (modules) are defined under the current Watershed Analysis process, including mass wasting, surface erosion, hydrology, riparian, stream channel, fish habitat, water quality, water supply/public works, and routing. No modules addressing cultural resources, restoration,

or wildlife are included in the State Watershed Analysis process, and monitoring is optional.

Cultural Resources

Under No Action Alternative 1-Scenario 2, cultural resources would be protected relative to forest practices in three ways. First, forest practices involving lands containing archaeological or historic sites registered with the Washington State Office of Archaeology and Historic Preservation, or on sites containing evidence of North American cairns, graves, or glyptic records, would be Class IV-Special Forest Practices (1998 WAC 222-16-050(i)(g)). These practices require an environmental checklist to be submitted with the forest practice application in compliance with SEPA, as they have the potential for a substantial impact on the environment. Additional information including a detailed environmental statement may also be required. Second, forest practices involving lands containing cultural, historic, or archaeological resources which, at the time the application or notification is filed are: a) listed or are eligible for listing with the National Register of Historic Places, or b) have been identified to the Washington DNR as being of interest to an affected Indian Tribe, would be Class III forest practices (1998 WAC 222-16-050(5)(k)). When a Class III application associated with a cultural resource, as described in (a) or (b) of this paragraph, is submitted, the landowner would need to meet with the appropriate Indian Tribe to determine which cultural resources are present and discuss their protection. Third, cultural resources would be protected incidentally because of the rules protecting riparian habitat and wetlands (described above under *Riparian Habitat*).

Adaptive Management

Technically, adaptive management, under No Action Alternative 1-Scenario 2, would follow the policy in effect on January 1, 1999, that was defined in the 1998 Washington Forest Practices Rules (1998 WAC 222-12-046). An adaptive management policy was adopted by the Forest Practices Board to further the purposes of RCW Chapter 76.09. It was designed to modify the regulations and their application based on cooperative research, monitoring and evaluation. Such adaptive management included the measures set out in the 1998 WAC 222-08-035. These measures required the Washington DNR to report to the Forest Practices Board on opportunities to modify the regulations when baseline data, monitoring, evaluation or the use of interdisciplinary teams show that such adaptive management would better meet the purposes and policies of the Forest Practices Act. Purposes and policies of the Forest Practices Act are found in RCW Chapter 76.09.010 (Legislative finding and declaration).

As a practical matter, however, implementation of the January 1, 1999, Washington Forest Practices Rules adaptive management program requires the participation of stakeholders—the same stakeholders that had embarked upon the FFR collaboration by that time. The January 1, 1999, Washington Forest Practices Rules adaptive management process was effective because the collaboration, then under TFW, was robust.

However, this scenario, if implemented as a result of "no action" by the Federal agencies, would suffer from even-less stakeholder support than No Action Alternative 1-Scenario 1.

Not only would No Action Alternative 1-Scenario 2 likely result in a substantial reduction in stakeholder participation and funding support as a result of not receiving the anticipated ESA take authorization, it would likely lose further support because it results in a degradation of resource protection that results from the "roll-back" of regulations. In addition, the January 1, 1999, Washington Forest Practices Rules adaptive management program included much less specific statutory and regulatory direction about the purpose of the program. It is reasonable to assume that the program would suffer from that lack of direction, and agreement would be more difficult to reach on how to spend very limited resources, compared with current conditions.

A detailed discussion of the effect of varying levels of support for the adaptive management program is found in Chapter 4 (Environmental Effects).

2.3.2 Alternative 2 (Issuance of Two Incidental Take Permits and Implementation of an HCP)

2.3.2.1 General Description

Alternative 2 would result in the Services issuing Incidental Take Permits (ITPs) to the State of Washington authorizing the incidental take of threatened or endangered salmonids through the implementation of a statewide programmatic HCP. The State's proposed HCP, which accompanies this DEIS, is referred to as the State of Washington Forest Practices Habitat Conservation Plan (FPHCP).

The FPHCP incorporates the current State Forest Practices Regulatory Program and Rules. The ITPs would extend incidental take authorization for the covered aquatic species to all non-Federal and non-tribal forest landowners conducting forest practices activities in compliance with the State Forest Practices Regulatory Program including the prescriptive rules (with the exception of those landowners that already have an existing HCP and ITP covering the same species). It is anticipated that the ITPs would be amended to include the incidental take of seven stream-associated amphibians, non-listed salmonids, and other Washington native fish, if and when these species become listed in the future. Conservation measures for these currently unlisted species would be an integral part of the FPHCP. Under this alternative, the ITPs would be valid for a term of 50 years.

In comparison to either scenario under No Action Alternative 1, the outcomes of Alternative 2 are more predictable based on the continued implementation of the Forest Practices Regulatory Program as currently described in WAC 222. Expected outcomes include:

- Stakeholder support and participation in program implementation,
- Continued public funding, and
- Less immediate need for identifying forestry-related Total Maximum Daily Loads (TMDLs), as required by the Federal Clean Water Act, and use of the Washington Forest Practices Rules as the implementation mechanism for forestry on State and private forestlands related to setting TMDLs for mixed-use lands.

Under Alternative 2, no Federal action under Section 9 would be brought against any person complying with and covered by the ITPs. Further, it is unlikely that any related third party action to enforce the Section 9 take prohibition against a person complying with and covered by the ITPs would occur. If it did, the existence of the ITPs would serve as a defense in the legal action.

2.3.2.2 Washington Forest Practices Rules and Program – Specific Description

Alternative 2 is the State's proposed habitat conservation plan, based on the FFR (April 29, 1999), as supplemented by Engrossed Senate and House Bill 2091, and subsequently refined. The groups who contributed to the development of the FFR included State agencies (Governor's Office, Washington DNR, WDFW, and Ecology), Federal agencies (USFWS, NMFS, and EPA), the Colville Confederated Tribes, the Northwest Indian Fisheries Commission, the Washington State Association of Counties, the Washington Forest Protection Association, and the Washington Farm Forestry Association.

Water Typing

Under Alternative 2, water-typing rules would be the same as those described for No Action Alternative 1-Scenario 1 (subsection 2.3.1.2, Washington Forest Practices Rules and Program – Specific Description).

Riparian Habitat

Under Alternative 2, the riparian rules would be the same as those described for No Action Alternative 1-Scenario 1 (subsection 2.3.1.2, Washington Forest Practices Rules and Program – Specific Description).

Wetlands

Under Alternative 2, the wetlands rules would be the same as those described for No Action Alternative 1-Scenario 1 (subsection 2.3.1.2, Washington Forest Practices Rules and Program – Specific Description).

Hydrology

Under Alternative 2, the hydrology rules would be the same as those described for No Action Alternative 1-Scenario 1 (subsection 2.3.1.2, Washington Forest Practices Rules and Program – Specific Description).

Forest Pesticides

Under Alternative 2, the forest pesticide rules would be the same as those described for No Action Alternative 1-Scenario 1 (subsection 2.3.1.2, Washington Forest Practices Rules and Program – Specific Description). However, it should be noted the Services would not provide take authorization for the use of forest pesticides as provided in the Washington Forest Practices Rules pending resolution of consultations between the Services and EPA regarding the effects of pesticide applications on listed species.

Unstable Slopes

Under Alternative 2, the rules pertaining to unstable slopes would be the same as those described for No Action Alternative 1-Scenario 1 (subsection 2.3.1.2, Washington Forest Practices Rules and Program – Specific Description).

Forest Roads

Under Alternative 2, the forest roads rules would be the same as those described for No Action Alternative 1-Scenario 1 (subsection 2.3.1.2, Washington Forest Practices Rules and Program – Specific Description).

Watershed Analysis

Under Alternative 2, the Watershed Analysis rules would be the same as those described for No Action Alternative 1-Scenario 1 (subsection 2.3.1.2, Washington Forest Practices Rules and Program – Specific Description).

Cultural Resources

Under Alternative 2, the cultural resources rules would be the same as those described for No Action Alternative 1-Scenario 1 (subsection 2.3.1.2, Washington Forest Practices Rules and Program – Specific Description).

Adaptive Management

Under Alternative 2, the adaptive management program would be in the rules as described in WAC 222-12-045 and summarized below. The adaptive management program is more fully described in the FPHCP. The FPHCP addresses the consistency between the State's adaptive management program and Federal ESA requirements. Receiving ESA take authorization through Section 10 of the ESA would provide the anticipated incentive and opportunity for the adaptive management program to be a robust and functionally effective program. FFR participants voluntarily provide technical support to the adaptive management process, as well as forest sites and logistical support for on-going research. Broad stakeholder support and participation in the FFR collaboration would ensure the program has sufficient resources to staff and carryout the anticipated research and monitoring effort. Under this alternative, it is expected that the program would continue to receive public funding as well as broad support and direct participation by stakeholders. The resulting adaptive management program would address, as anticipated, scientific uncertainty and the degree to which the current Washington Forests Practices Rules meet established resource goals and objectives. A description of how the program would function is provided in the following paragraphs.

The adaptive management program was established to produce science-based recommendations and technical information to assist the Forest Practices Board in determining if and when it is necessary or advisable to adjust the Washington Forest Practices Rules and guidance to achieve the performance goal and resource objectives. The Washington Legislature established the adaptive management program as the primary means by which regulations could be modified (subsection 1.3.1.2, The Forests and Fish

Report). The adaptive management program has three guiding principles: 1) ensure certainty of change as needed to protect covered resources; 2) ensure predictability and stability of the process of change so that landowners, regulators, and interested members of the public can anticipate and prepare for change; and 3) ensure that quality controls are applied to scientific study design, project execution, and interpreted results.

The performance goal for the adaptive management program is to ensure that forest practices, either singularly or cumulatively, would not significantly impair the capacity of aquatic habitat to: 1) support harvestable levels of salmonids; 2) support the long-term viability of other covered species; and 3) meet or exceed water quality standards, including protection of beneficial uses, narrative and numeric criteria, and anti-degradation (Forests and Fish Report Schedule L-1; WAC 222-12-045 (2)(a)(ii)).

Resource objectives consist of functional objectives and performance targets and are designed to ensure that the aforementioned performance goal is met. Functional objectives are broad statements regarding major watershed functions potentially affected by forest practices. Performance targets are measurable criteria defining specific target forest conditions and processes. Functional objectives and performance targets have been established for water temperature, large woody debris/litterfall, sediment, hydrology, and forest chemical inputs and are listed in Schedule L-1 of the Forests and Fish Report.

The primary components of the adaptive management program include the Forest Practices Board, the TFW/FFR Policy Group, or similar collaborative forum; the CMER Committee; the Adaptive Management Program Administrator; and the Scientific Review Committee. The role of each of these program components is described below.

Forest Practices Board

The Forest Practices Board manages the adaptive management. The Board approves CMER members, establishes key research and monitoring questions and resource objectives, approves research and monitoring priorities and projects, approves CMER budgets and expenditures, oversees fiscal and performance audits of CMER, participates in the dispute resolution process, and considers recommendations from TFW/FFR Policy Group or similar collaborative forum for adjusting Washington Forest Practices Rules and guidance.

TFW/FFR Policy Group

TFW/FFR Policy Group, or a similar collaborative forum, makes recommendations to the Forest Practices Board regarding CMER priorities and projects, final project reports, and Washington Forest Practices Rules and/or guidance amendments. Policy membership is self-selecting and generally includes Washington DNR, WDFW, and Ecology, Federal agencies (including NMFS, USFWS, EPA, and the USDA Forest Service), timber landowners, tribal governments, county governments, environmental interests, and the Governor's Office.

Cooperative Monitoring, Evaluation, and Research (CMER) Committee

The CMER Committee oversees and conducts research and monitoring related to the established resource objectives. The primary purpose of the CMER Committee is to advance the science needed to support the adaptive management process. The committee is charged with developing and managing: 1) scientific advisory groups and sub-groups, 2) research and monitoring programs, 3) a set of protocols to define and guide the execution of the process, 4) a baseline dataset used to monitor change, and 5) a process for policy approval of research and monitoring projects and use of external information. The CMER Committee is composed of individuals that have expertise in scientific disciplines that will help address forestry, fish, wildlife, and landscape process issues including mass wasting, hydrology, and fluvial geomorphology. Membership is approved by the Forest Practices Board and is open to Washington DNR, WDFW, Ecology, Federal agencies (including NMFS, USFWS, and EPA), timber landowners, tribal governments, county governments, and environmental interests.

Adaptive Management Program Administrator

The Adaptive Management Program Administrator is a full-time employee of Washington DNR and is responsible for overseeing the adaptive management program and supporting CMER. The Administrator makes regular reports to Policy and the Forest Practices Board on program and project priorities, status, and expenditures. The Administrator has credentials as a program manager, scientist, and researcher.

Scientific Review Committee

The Scientific Review Committee carries out an independent peer review process to determine if work performed by CMER is scientifically sound and technically credible. The Scientific Review Committee is comprised of individuals with experience in scientific research and has no affiliation with the CMER Committee. Scientific Review Committee members are selected by the Committee editor and can be nominated by the CMER Committee. CMER determines what products should be subject to review by the Scientific Review Committee, but at a minimum, the Scientific Review Committee reviews final reports of CMER funded studies, certain CMER recommendations, and pertinent studies not published in a CMER-approved, peer-reviewed journal. Other products that may require review include external information or data, work plans, requests for proposal, study proposals, final study plans, and progress reports.

The adaptive management process involves all program components detailed above. A process framework for implementing the program is described in the FFR and WAC 222-12-045. A more detailed process guide is being developed and will be included in the Forest Practices Board Manual (Section 22). The Board Manual guide will serve as a procedures manual for the adaptive management program and will further define the roles and responsibilities of the various program components described in the FFR and regulations. The adaptive management Board Manual will also include the CMER Protocols and Standards Manual that describes the operational aspects of the program's research and monitoring branch. The Protocols and Standards Manual will further define

the roles and responsibilities of the CMER Committee, its members, and its Scientific Advisory Groups described in the FFR and regulations. The Protocols and Standards Manual, under development, will also describe processes such as project prioritization, project management, data and document management, budgeting, accounting, contracting, and dispute resolution.

The CMER Committee produced a work plan in 2004 that described the various adaptive management research and monitoring programs, associated projects, and work schedule. The draft 2005 Work Plan has been reviewed by TFW/FFR Policy Group and has been submitted for approval to the Forest Practices Board at its November 2004 meeting. The CMER Work Plan is intended to inform CMER participants, policy constituents, and members of the public about CMER activities. The Plan is a document that is to be revised in response to research findings, changes in policy objectives, and funding. A summary of the CMER Committee's research and monitoring programs follows. For more detail see the latest CMER Work Plan at the following Web site:
http://www.dnr.wa.gov/htdocs/agency/federalassurances/servicesreview/

Effectiveness and Validation Monitoring

Effectiveness monitoring is designed to evaluate the degree to which Washington Forest Practices Rules and guidance meet performance targets and resource objectives. Validation monitoring will determine if the performance targets are appropriate for meeting the stated resource objectives. Effectiveness and validation monitoring are sometimes referred to as "prescription" or "best management practice" (BMP) monitoring because they are conducted at a site-scale and generally focus on specific rule prescriptions or practices. The CMER Committee has identified 16 effectiveness and validation monitoring sub-programs (CMER Work Plan 2004). Each sub-program has several associated projects, some of which have been scoped and are currently underway while others have not yet reached the scoping phase.

Extensive Monitoring

Extensive monitoring evaluates the statewide status and trends of key watershed processes and habitat conditions across covered lands. Extensive monitoring is a landscape-scale assessment of the effectiveness of Washington Forest Practices Rules to attain specific performance targets. This is different from effectiveness monitoring, which evaluates the effect of specific prescriptions or practices at the site scale. Extensive monitoring is designed to provide periodic measures of rule effectiveness that can be used in the adaptive management process to determine if progress is consistent with expectations. The CMER Committee has identified four extensive monitoring sub-programs (CMER Work Plan 2004). Currently, all extensive monitoring sub-programs are in the scoping and design phase.

Intensive Monitoring

Intensive monitoring is a watershed-scale research program designed to evaluate cumulative effects and to provide information that will improve understanding of the interactions between forest practices and covered resources. An evaluation of cumulative effects at a watershed scale requires an understanding of how individual actions or practices influence a site and how the associated responses propagate downstream through the system. This understanding is designed to enable the evaluation of the effectiveness of forest practices applied at multiple locations over time. Evaluating biological responses is similar and requires an understanding of how various actions interact to affect habitat conditions and how system biology responds to habitat changes. The CMER Committee has identified four research topics suitable for inclusion in an intensive monitoring program (CMER Work Plan 2004). Currently, scoping is underway to identify critical questions and hypotheses.

Rule Implementation Tools

Rule implementation tools are projects designed to develop, refine, or validate protocols, models, and targets used to facilitate forest practices rule implementation. Two types of rule tool projects have been identified. The first type is known as Methodological Projects. These projects involve the development, testing, or refinement of field protocols and models used in the identification and location of important landscape features such as water type breaks, unstable slopes, and sensitive sites. The second type is known as Target Verification Projects. Projects in this category are designed to assess the validity of performance targets thought to have an uncertain scientific foundation such as the DFC basal area targets for RMZs. The CMER Committee has identified nine rule implementation tool sub-programs consisting of 23 projects (CMER Work Plan 2004). The CMER Committee and Washington DNR have agreed to assign management and oversight of rule implementation tools to the DNR Forest Practices Division. Washington DNR advises the CMER Committee on project priorities and provides regular status reports for ongoing projects.

A detailed discussion of the effect of varying levels of support for adaptive management program is found in Chapter 4 (Environmental Effects).

2.3.3 Alternative 3 (Implement a Conservation Plan with a NMFS Section 4(d) Limit 13 Approval and USFWS 4(d) Take Exemption)

2.3.3.1 General Description

Under Alternative 3, NMFS, consistent with it regulations (65 FR 42422), would issue a finding that the regulations adopted by the Forest Practices Board are at least as protective as the elements of the FFR and are consistent with the conservation of listed salmonids. With such findings, the take prohibitions would not apply to non-Federal and non-tribal forest management activities in Washington under 50 CFR 223.203(b)(13) (ESA Section 4(d) Limit 13). The NMFS 4(d) rule is described in more detail in subsection 1.2.3.2 (ESA Section 4). Alternative 3 would also include the development and adoption of a 4(d)

rule by the USFWS to authorize take of bull trout. Take authorization under this alternative differs from Alternatives 2 and 4 in terms of species covered and duration. Take coverage under ESA Section 4(d) can only extend to species currently listed as threatened, and only to those species specifically addressed in the rule. This alternative, therefore, addresses only the take of threatened species in portions of seven Evolutionarily Significant Units (ESUs) in Washington State (Table 1-1; Table 3-20; Figures 3-3 through 3-8). Unlike Alternative 2 or Alternative 4, fish and amphibian species not listed as threatened would not be covered. In addition, this alternative would not cover endangered species (e.g., Upper Columbia River Spring Chinook salmon, Upper Columbia River steelhead, and Snake River sockeye salmon), or Snake River steelhead, Snake River Spring/Summer Chinook and Snake River Fall Chinook, which are listed as threatened but not included under NMFS' Limit 13. The existing NMFS 4(d) rule contains provisions for terminating the take authorization for cause. NMFS has retained in the 4(d) rule the authority to require changes to the conservation regime to maintain the take authorization. NMFS may also terminate or modify the take authorization by modifying the 4(d) rule.

The regulatory outcomes of Alternative 3 are expected to be somewhat predictable because they would involve the continued implementation of the Forest Practices Regulatory Program as currently described in WAC 222. Expected outcomes of Alternative 3 include:

- Decreased stakeholder support and participation relative to Alternative 2 because of lack of take authorization for endangered species, some threatened species, and unlisted species, and because of less certainty as to its term. Greater support and participation relative to either scenario under No Action Alternative 1 that does not include take authorization.
- Because of reduced stakeholder support and participation, public funding for implementation of the Forests Practices Regulatory Program would be uncertain compared to Alternative 2, but more certain than under either scenario under No Action Alternative 1.
- Compared with either scenario under No Action Alternative 1, there would be less immediate need for identifying forestry-related TMDLs, as required by the Federal Clean Water Act, and the Washington Forest Practices Rules would be used as the implementation mechanism for forestry on State and private forestlands related to setting TMDLs for mixed-use lands.
- There exists the possibility of 4(d) take authorization being revoked due to uncertainties resulting from the above outcomes or other reasons determined by the Services. The Services could also require, in the future, revisions to the conservation measures to maintain the 4(d) take authorization.

2.3.3.2 Washington Forest Practices Rules and Program – Specific Description

Both the rules and programs implemented under Alternative 3 would generally be the same as under Alternative 2, although differences would be likely to occur as a result of reduced

stakeholder support and participation levels in the non-regulatory programs because of reduced regulatory certainty. As with Alternative 2, funding for implementation of the Washington Forest Practices Regulatory Program under Alternative 3 is expected to be more certain than under No Action Alternative 1-Scenario 1 and Scenario 2 (but certainty of funding is less under Alternative 3 than under Alternative 2). This is particularly true for the adaptive management program (addressed in the next paragraph). Refer to subsection 2.3.2.2, Alternative 2, *Washington Forest Practices Rules and Programs – Specific Description*, for a description of the other specific rules and programs under Alternative 2.

The adaptive management program under Alternative 3 would be part of the rules, as described in WAC 222-12-045. However, because the regulatory stability afforded by Section 4(d) ESA coverage is substantially less than under Section 10, the adaptive management program would likely lose some of its support and, therefore, functional effectiveness relative to Alternative 2 and the status quo. However, it is reasonable to assume the reductions in participation and funding would not be as severe as under No Action Alternative 1-Scenario 1 or Scenario 2. The adaptive management program would function at some level in between No Action Alternative 1-Scenario 1 and Alternative 2. A reasonable assumption would be that a few more effectiveness and validation projects and/or rule tool projects might be funded, or that an intensive monitoring project could be done. Again, the timelines for accomplishing these projects would likely be longer due to less funding and fewer people willing to participate.

A detailed discussion of the effect of varying levels of support for adaptive management program is found in Chapter 4 (Environmental Effects).

2.3.4 Alternative 4 (Increased Forest Ecosystem Protections)

2.3.4.1 General Description

Alternative 4 was developed based on public comments and internal scoping discussions that identified the need for an alternative that would include more restrictive forest practices rules than Alternatives 2 or 3. Many aspects of this alternative are based on Pollack and Kenard (1998), Forest Ecosystem Management Assessment Team (1993), and other recommendations from the public (subsection 2.4.3, Alternative with a Higher Protection/Restriction Level).

Under Alternative 4, the Services would issue ITPs to the State of Washington for a more restrictive set of Washington Forest Practices Rules than are represented by the current Forest Practices Regulatory Program. Alternative 4 is the same as Alternative 3 in the *Final Environmental Impact Statement on Alternatives for Forest Practices Rules for Aquatic and Riparian Resources (SEPA EIS)*, which was developed to meet the requirements under SEPA for the adoption of the Washington Forest Practices Rules of 2001 (subsection 2.3.4.2, Washington Forest Practices Rules and Program – Specific Description). Alternative 4 would include issuance of two ITPs (one by each Service) that would be valid for a term of 50 years (subsection 2.3.2.1, Alternative 2, *General Description*).

Alternative 4 would require action by the State Legislature or a court order to initiate additional rule-making by the Forest Practices Board to increase protective measures in the Washington Forest Practices Rules. By current statute, the Forest Practices Board can only modify the current Washington Forest Practices Rules pertaining to aquatic resources by: recommendations resulting from the adaptive management program, State legislative direction, or court order (RCW Chapter 6.09.370(6)) (subsection 1.3.1.2, The Forests and Fish Report). Because this alternative would effectively negate the FFR and the resulting Forest Practices Regulatory Program, the near-term and long-term outcomes may include:

- A decrease in public funding for implementation of the Forests Practices Regulatory Program, particularly monitoring and adaptive management,
- A need to prepare more forestry-related TMDLs sooner (relative to current rules) since the EPA timing for setting forestry TMDLs was predicated on the 2001 rules and adaptive management program, and
- A decrease in the collaboration and participation among Forests and Fish stakeholders, particularly landowner participation, in the implementation of the non-regulatory elements of the FFR.

2.3.4.2 Washington Forest Practices Rules and Program – Specific Description

The forest practices rules and programs under Alternative 4 would be more restrictive than those approved under No Action Alternative 1-Scenario 1 (or Alternatives 2 and 3), and substantially more restrictive than the rules in effect on January 1, 1999 found under No Action Alternative 1-Scenario 2. The following specific forest practices rules and programs are included under Alternative 4.

Water Typing

Under Alternative 4, a geomorphic-based system for defining streams, consisting of three water types, is identified as follows:

- Streams with a gradient between 0 and 20 percent—these are channels considered to be important for fish.
- Streams with a gradient between 20 and 30 percent—these are channels considered to be important for coarse sediment storage and as a source of LWD.
- Streams with a gradient greater than 30 percent—these are channels considered to be important because they are prone to channelized landslides and are sources of LWD.

Riparian Habitat

This section describes the riparian habitat protection provided by Alternative 4. In addition to this protection, major waterways designated as "Shorelines of Statewide Significance" are given additional protection under the Shoreline Management Act. This additional protection would be the same as that described under No Action Alternative 1 (subsection 2.3.1.2, Washington Forest Practices Rules and Program – Specific Description).

RMZ Description

Under Alternative 4, buffers are identified along all streams. These zones are measured horizontally from the bankfull width, Channel Migration Zone, Beaver Habitat Zone (See footnote 1 to Table 2-13), or Channel Disturbance Zone (See footnote 2 to Table 2-13), whichever is greater. They are generally the same on both the east and westsides of the State (Table 2-13). These are no-harvest buffers, except for improving riparian function through thinning as defined below.

Limited thinning would be allowed within these buffers, but only in the specific case of converting a hardwood-dominated stand to one that is conifer-dominated (Option 1), or facilitating the development of 200-year-old stand conditions (Option 2). These options are further described below.

No harvest is allowed within 30 feet of the bankfull width in any stand or within the Beaver Habitat Zone. In addition, no harvest is allowed of trees that are of sufficient size to produce functionally sized wood as LWD; these trees are determined using the method in Bilby and Ward (1989) for stream channels with bankfull widths of 50 feet or less, or the method in Abbe (1997) for channels greater than 50 feet. All cut trees are to remain within the riparian area, until monitoring reveals the prescriptions are effectively meeting riparian and channel objectives.

Landowners applying for either thinning option would be subject to a Class IV-Special permit, which requires SEPA review. In addition, a monitoring program must be implemented to document conditions within the riparian area and adjacent stream channel prior to and after riparian treatments.

Either thinning option would be limited to 10 percent or less of the total stream length within an individual ownership over the first 5 years. No more than 20 percent of the total stream length within an individual ownership would be treated until effectiveness monitoring indicates that riparian and channel goals are being met.

Option 1—Hardwood Conversion

Where converting hardwood-dominated riparian areas to conifer vegetation is necessary, only trees in excess of the 140 largest trees per acre can be harvested.

Table 2-13. Riparian Buffer Widths under Alternative 4.

Channel Gradient	Minimum Buffer Width (feet)	Expanded Buffers
0 to 20 %	200	Channel migration zone, Beaver Habitat Zone[1/]
20 to 30 %	100	Channel Disturbance Zone[2/]
>30%	70	Channel Disturbance Zone[2/]

1/ Beaver Habitat Zone is the area occupied by beaver ponds and adjacent riparian areas that are currently used by beavers or have potential beaver habitat.
2/ Channel Disturbance Zone is the area within 30 feet of the lateral extent of an expected channelized landslide.

> = greater than
% = percent

Option 2—Conifer Stand Development

Where facilitating the development of a 200-year stand condition is desired while providing sufficient near-term recruitment potential, a maximum of 15 percent understory conifer removal is permitted.

Salvage Logging within RMZs

Salvage logging within an RMZ under Alternative 4 would be restricted as described under No Action Alternative 1-Scenario 1.

Cable Yarding

Cable yarding within an RMZ under Alternative 4 would be restricted as described under No Action Alternative 1-Scenario 1.

Wetlands

Under Alternative 4, a new hydrogeomorphic wetland classification system (one based on water flow patterns, location in the landscape, and topography) would be developed and adopted. In addition, in contrast to current rules that require a variable-width Wetland Management Zone on non-forested wetlands, fixed-width Wetland Management Zones would be established on non-forested wetlands under this alternative. Open water wetlands, including bogs, would receive a managed 200-foot buffer, and other non-forested wetlands would receive a 100-foot managed buffer. In forested wetlands, similar to current rules, no Wetland Management Zones would be established. However, only partial harvest would be allowed; snags, non-merchantable trees, understory vegetation, and 70 percent of the canopy cover would be retained.

Hydrology

Under Alternative 4, a landscape rule would be applied to all applications to limit the amount of early seral land within a watershed in the rain-on-snow zone. The rule would maintain a minimum of two-thirds of lands, by ownership, within the rain-on-snow zone of a basin 1,000 acres or more in size, in stands that are at least 25 years old.

Forest Pesticides

Under Alternative 4, three main changes to current Washington Forest Practices Rules would be adopted. First, plants with cultural value would specifically be protected from forest pesticides, by not allowing application on areas they are known to occur. Second, hand-application of forest pesticides would be prohibited within 50 feet of all typed waters. Finally, in cases where forest pesticides are necessary to help restore RMZ function, an alternative plan would be needed to proceed.

However, it should be noted the Services will not provide take authorization for the use of forest pesticides as provided in the Washington Forest Practices Rules pending resolution of consultations between the Services and EPA regarding the effects of pesticide applications on listed species.

Unstable Slopes

Under Alternative 4, high-hazard unstable slopes would be defined as under No Action Alternative 1-Scenario 1. However, all planar slopes greater than 80 percent slope would be added to the high hazard geomorphic list. If the high hazard unstable slope has the potential to deliver sediment to a public resource or to threaten public safety, no forest practices would be allowed on the high hazard landform or within 50 feet of the high hazard landform. Moderate hazard landforms would include all slopes greater than 50 percent. Management prescriptions for moderate landforms would be developed.

Forest Roads

The rules for forest roads under Alternative 4 would be similar to No Action Alternative 1-Scenario 1 in respect to the requirements for road location and design and road and landing construction requirements. Road maintenance and abandonment plans would be required for all landowners, and the plans would be implemented by 2010. In addition, under this alternative, there would be no net increase in roads within an ownership or within a basin. Whenever a new road is proposed, an equivalent amount of road on the same property or the same basin would have to be abandoned using the abandonment guidelines in the current rules. Orphan roads would also be inventoried and assessed. In addition, orphan roads would also have to be abandoned using the abandonment guidelines in the current rules.

Watershed Analysis

Under Alternative 4, all aspects of the Watershed Analysis process would be the same as under the other alternatives. In addition, under Alternative 4, post-Watershed Analysis monitoring would still be voluntary for those watershed analyses that are completed, but would be required for all new watershed analyses conducted. Likewise, restoration plans for degraded instream and riparian areas with the potential to supply critical habitat requirements would be required in all Watershed Administrative Units.

Cultural Resources

Under Alternative 4, the protections provided under Alternative 1 would still be in place. However, the degree of incidental protection provided to cultural resources in riparian habitats and wetlands would be increased in proportion to the increase in the amount of area protected in these habitats under Alternative 4. As in No Action Alternative 1-Scenario 1, a new cultural resources module would be added to the State Watershed Analysis procedures.

Adaptive Management

Under Alternative 4, the adaptive management process would be linked more directly to the Forest Practices Board. The Forest Practices Board would take direct control over all effectiveness and validation monitoring and any research projects needed to answer questions relevant to forest practices. The TFW/FFR Policy Group would be disbanded, and a new stakeholder advisory committee would be established that does not work on a consensus basis and whose membership is approved by the Forest Practices Board.

Proposals for changes to the rules that are supported by a simple majority, and even a minority, of the committee may be brought before the Forest Practices Board for review and decision.

However, while regulatory certainty in the form of Section 10 ITPs, from each of the Services, is part of Alternative 4, the alternative is not likely to be broadly supported among FFR stakeholders, particularly the landowner caucus. Due to the substantial increase in regulatory protective measures and associated costs and revenue losses, landowner support for adaptive management would likely decrease substantially. The resulting effects would likely be less in-kind participation, less access to private lands for research and monitoring, and the state being less successful in competing for funding to support the adaptive management program. Thus, while protective measures are greater under Alternative 4 than other alternatives, the ability of the adaptive management program to measure the effectiveness of those measures would be reduced.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

In addition to the four alternatives analyzed in detail in this DEIS and described in subsection 2.3 (Alternatives Analyzed in Detail), three other alternatives were also considered. Many of the elements of the individual proposals identified below were incorporated into the four alternatives analyzed in detail. However, these proposals were not analyzed in detail as a whole because they did not satisfy the stated purpose and need.

2.4.1 Alternative with Fewer Restrictions on Landowners than the Proposed FPHCP

Comments received through public scoping suggested that an alternative should be considered that had fewer restrictions for landowners than the current Washington Forest Practices Rules included in the State's proposed FPHCP. This alternative could be one that is similar to the Washington Forest Practices Rules that were in effect on January 1, 1999, prior to the current Washington Forest Practices Rules. This alternative was considered, but is not analyzed in detail because: 1) it would not be consistent with the direction of the State Legislature; 2) it is not consistent with the stated purpose and need in that it would not allow for adequate protection and conservation of listed, proposed, and unlisted species to the extent intended under ESA Section 10(a)(1)(B) and Section 4(d), while providing for long-term management of forest resources on State and private lands (subsection 1.3, Background and Context); and 3) the effects of this alternative are considered in the scenarios of the No Action Alternative 1 (subsection 2.3.1, Alternative 1).

2.4.2 Alternative with a Reduced Permit Duration or the Elimination of a "No Surprises" Provision

Some of the comments received during scoping suggested that it is premature to provide take authorization based on the current Washington Forest Practices Rules for the long term. They suggested an alternative that would be similar to the State's proposed FPHCP,

Alternative 2, except that it would either limit the duration of take authorization to 5 or 10 years or would not include a "No Surprises" provision. The "No Surprises" policy (U.S. Federal Register, Vol. 63, No. 35, February 23, 1998, pages 8859-8873) has been a provision in the Section 10 process that has meant that no additional restrictions or protective measures would be imposed on an HCP permit holder beyond those indicated in the HCP and associated Implementation Agreement.[1] Under "No Surprises," the Services would not require the commitment of additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources beyond the level otherwise agreed to in the FPHCP without the consent of the permittee, as long as the permittee is implementing the terms and conditions of the FPHCP, ITP, and other associated documents, in good faith. This type of alternative was recommended by a number of commenters to allow for changes deemed necessary for species conservation as a result of scientific monitoring.

Factors considered by the Services to determine the appropriate permit duration include the duration of an applicant's proposed activities and the expected positive and negative effects on covered species associated with the proposed duration. The Services also consider the extent that the conservation program being implemented would increase the long-term survivability of the listed species and/or enhance its habitat. For activities that occur over extended time periods (e.g., timber harvest management), the permit would appropriately need to encompass time periods sufficient to address the temporal aspects of those activities.

This alternative was considered, but it was not analyzed in detail because it does not meet the purpose and need. Specifically, this alternative does not provide for long-term regulatory stability, in that landowners would not necessarily have some predictable set of forest practices regulations, due to a permit length of only 5 to 10 years. Also, a reduced permit length does not encompass the time period for the activities described in this EIS (i.e., timber harvest management).

2.4.3 Alternative with a Higher Protection/Restriction Level

A number of commenters recommended alternatives for consideration that are much more restrictive than the current Washington Forest Practices Rules. Some commenters recommended an alternative based on the 10,000 Years Institute *Low-Risk Strategy for Preserving Riparian Buffers Needed to Protect and Restore Salmonid Habitat in Forested*

[1] Pursuant to a June 10, 2004 court order in *Spirit of Sage Council v. Norton*, Civil Action No. 98-1873 (D.DC), the U.S. Fish and Wildlife Service and the National Marine Fisheries Service area enjoined from approving new ESA Section 10(a)(1)(B) permits or related documents containing "No Surprises" assurances until such time as the USFWS adopts new permit revocation rules specifically applicable to ESA Section 10(a)(1)(B) permits in compliance with public notice and comment requirements of the Administrative Procedures Act. Until such time that USFWS' and NMFS' authority to issue permits with "No Surprises" assurances has been reinstated, the UFSWS and NMFS will not approve any Incidental Take Permits or related documents that contain "No Surprises" assurances.

Watersheds of the Pacific Northwest. This strategy includes riparian buffers of 250 feet in width on all perennial streams, and riparian buffers equal to 50 to 250 feet in width on all seasonal streams (Pollack and Kenard 1998). Others recommended an alternative based on the 1993 report by the Forest Ecosystem Management Assessment Team (FEMAT 1993), which forms the basis for riparian protection on many Federal lands in the Northwest. A number of other broad recommendations were also made for more restrictive alternatives.

Alternative 4, as described in subsection 2.3.4 (Alternative 4 – Increased Forest Ecosystem Protections) responds to these comments in providing higher levels of protection/restriction for the covered species than are provided by Alternative 2. Specific aspects of this alternative are based on Pollack and Kenard (1998), FEMAT (1993), and other public scoping comments. A number of variations of Alternative 4 were considered in light of the range of reasonable alternatives developed for this action. Alternative 4 is similar to the most restrictive alternative that was analyzed and rejected by the State during its evaluation and revision of the riparian Washington Forest Practices Rules. Therefore, Alternative 4 is already at the end of the range of reasonable alternatives, and is representative of the higher protection/restriction level alternatives.