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# Summary

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## INTRODUCTION

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The State of Washington (the State) has submitted applications to the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS), collectively referred to as the Services, for authorizations that would allow for the incidental take of aquatic species (salmon, steelhead, bull trout, and certain unlisted species, should they become listed) under the Endangered Species Act (ESA) through Section 10(a)(1)(B) and Section 4(d). The applications relate to the potential for take that may result from activities under the Washington Forest Practices Regulatory Program. Take authorizations can be obtained from both Services under Section 10(a)(1)(B) through an Incidental Take Permit (ITP). An ITP can provide take authorization for endangered and threatened species and also can provide take authorization for unlisted species should they become listed at some time in the future. Take authorization under ESA Section 4(d) is available for species listed as threatened (but not endangered), but only if a specific 4(d) rule has been adopted that addresses the threatened species. It can be obtained from NMFS through an existing 4(d) rule, within which is included a limit that pertains to the State of Washington’s Forest Practices Regulatory Program (Limit 13), or through an authorization defined in some future 4(d) rule, not currently contemplated. It can be obtained from USFWS only through a take exemption defined in some future 4(d) rule (because no existing USFWS 4(d) rules apply either to the species addressed by the State’s applications or to the State’s Forest Practices Regulatory Program).

An ITP and/or take limit or exemption (collectively referred to as take authorization) are expected to: (1) provide long-term regulatory stability for forest management activities that are regulated by the Washington Forest Practices Regulatory Program; (2) allow for the protection of covered species to the maximum extent practicable consistent with maintaining commercial forestry as an economically viable industry; and (3) provide a regulatory climate and structure more likely to keep landowners in commercial forestry, rather than converting forestlands to other uses that may be less desirable for salmon recovery.

Providing take authorization as a result of the State’s application would be a major step towards achieving the goals of the Forests and Fish Report (April 1999), on which the current Washington Forest Practices Regulatory Program is based (See subsection 1.3.1, Forest Practices Regulatory Program).

The species that could be covered by issuance of ITPs from each of the Services include all threatened and endangered fish listed at the time of this application, and occurring on the covered lands in Washington, plus other, unlisted native fish and seven stream-associated amphibians. Most anadromous fish species fall within the jurisdiction of NMFS, while non-anadromous fish, some anadromous fish, and the amphibians fall within the jurisdiction of USFWS. The species that would be covered by issuance of a limit under NMFS’ existing 4(d) rule or take exemptions through any future 4(d) rules (NMFS or USFWS) include only threatened species addressed at that time by the specific 4(d) rules. The geographic area that would be addressed by issuance of ITPs or limits under ESA



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1 Section 4(d) includes existing and future non-Federal and non-tribal forestlands in  
2 Washington State, excluding those forestlands that are covered by existing ITPs for aquatic  
3 species.

4 To obtain ITPs under ESA Section 10(a)(1)(B), the State must prepare a Habitat  
5 Conservation Plan (HCP) that meets the issuance criteria established by the Services (See  
6 subsection 1.2.3.1, Decisions to be Made, ESA Section 10). For the State to obtain take  
7 authorizations under ESA Section 4(d), the State must prepare information similar to that  
8 contained in an HCP, with some modifications specific to any requirements that may be  
9 contained in the applicable 4(d) rule. Accordingly, the State has prepared a programmatic  
10 conservation plan (see Forest Practices Habitat Conservation Plan [FPHCP]) that addresses  
11 the requirements of both ESA Section 10(a)(1)(B) and NMFS' existing ESA Section 4(d)  
12 rule. This conservation plan covers aspects of the Washington Forest Practices Regulatory  
13 Program that may affect aquatic species.

14 The proposed Federal actions of issuing ITPs or take authorizations under ESA Section  
15 4(d) have the potential to affect the human environment and, therefore, are actions subject  
16 to review under the National Environmental Policy Act (NEPA). The Services are required  
17 to prepare NEPA review documents and circulate the environmental review package  
18 (NEPA document and Habitat Conservation Plan) for public review. In this case, the  
19 Services have determined that there is a need to prepare an Environmental Impact  
20 Statement (EIS).

## **PURPOSE AND NEED FOR ACTION**

21  
22 The purpose for this action is to respond to the State of Washington's applications for ESA  
23 take authorizations. These authorizations can be through ITPs, issued by each of the  
24 Services under ESA Section 10(a)(1)(B), or through take authorizations under ESA Section  
25 4(d). If ITPs are issued, they would allow for incidental take of the threatened and  
26 endangered species and make provision for take authorization of proposed and unlisted  
27 species should they become listed under the ESA in the future. If ESA Section 4(d) take  
28 authorizations are issued, they would only apply to those threatened species addressed in  
29 the relevant 4(d) rules.

30 The need for this action is to provide broader protection and conservation for listed,  
31 proposed, and unlisted species under ESA Section 10(a)(1)(B) and Section 4(d) than would  
32 occur through individual civil or criminal actions to enforce the ESA's Section 9  
33 prohibition against take of listed species, while providing for the long-term management of  
34 forest resources on State and private lands under the Washington Forest Practices Rules  
35 (See subsection 1.3, Background and Context).

## **ALTERNATIVES**

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37 This EIS analyzes a No-Action Alternative and three action alternatives (see Chapter 2,  
38 Alternatives). The action alternatives are identified as Alternatives 2, 3, and 4 and the No-  
39 Action Alternative is identified as Alternative 1. No Action Alternative 1 has two



1 scenarios. A summary description of each of these No-Action scenarios and the action  
2 alternatives is provided below. Refer to Chapter 2 (subsection 2.3, Alternatives Analyzed  
3 in Detail) for detailed descriptions.

## 4 **No-Action Alternative (Alternative 1)**

5 No Action means no ITPs or take authorization under any 4(d) rules would be issued. A  
6 range of outcomes could result from this lack of action. Two scenarios which represent the  
7 endpoints of the reasonable range of possible outcomes have been defined to represent the  
8 No-Action Alternative and are referred to as No Action Alternative 1-Scenario 1 and No  
9 Action Alternative 1-Scenario 2. The effects of No Action are displayed for both of these  
10 endpoints in the effects analyses in Chapters 4 and 5, but the actual effects of No Action on  
11 the individual resources are likely to fall between the effects described for each of the two  
12 scenarios.

13 *No Action Alternative 1-Scenario 1:* Under No Action Alternative 1-Scenario 1, no ITPs  
14 or take authorization would be issued and the current rules (which are based on the Forests  
15 and Fish Report and became effective in July 2001) would remain in effect. However, the  
16 amount of collaboration and participation among Forests and Fish stakeholders in adaptive  
17 management, associated monitoring, and other program elements that depend on  
18 landowner support and participation would be substantially reduced because of the absence  
19 of the anticipated regulatory certainty provided by take authorization. As a result, there  
20 would be reduced public funding for the non-regulatory elements of the program and the  
21 ability to modify the rules over time, largely limited by statute only to modifications based  
22 on scientific research, would be substantially reduced.

23 *No Action Alternative 1-Scenario 2:* Under No Action Alternative 1-Scenario 2, no ITPs  
24 or take authorization would be issued and the Washington State Legislature would allow  
25 the Forest Practices Board to repeal the current State rules, adopting in their place, the less-  
26 protective rules that were in effect on January 1, 1999. The amount of collaboration and  
27 participation among Forests and Fish stakeholders in the adaptive management program,  
28 associated monitoring, and other program elements that depend on landowner support and  
29 participation would be substantially reduced because of the lack of the anticipated  
30 regulatory certainty provided by take authorization. Furthermore, the “roll-back” of  
31 regulations to the less-protective January 1, 1999 rules would result in even-more  
32 reductions in stakeholder participation and support for the program from levels anticipated  
33 in No Action Alternative 1-Scenario 1. The reduced support would result in reduced  
34 public funding. No Action Alternative 1-Scenario 2 would signify the end of the current  
35 Washington Forest Practices Rules (i.e., Forests and Fish Rules).

## 36 **Alternative 2**

37 Under Alternative 2, the Services would issue ITPs to the State of Washington, based on  
38 implementation of the proposed statewide Forest Practices Habitat Conservation Plan  
39 (FPHCP). The FPHCP incorporates the current Washington Forest Practices Rules (which  
40 are based on the Forests and Fish Report and became effective in July 2001). The State is  
41 seeking an ITP from each of the Services, each for a term of 50 years. Because of greater



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1 regulatory certainty with the ITPs, stakeholder support and participation and public  
2 funding for adaptive management, associated monitoring, and other program elements that  
3 depend on landowner support and voluntary participation and public funding would  
4 continue.

5 The Services have determined that Alternative 2 is the preferred alternative because it  
6 meets the Purpose and Need for action and will fulfill the Services' statutory missions and  
7 responsibilities under ESA to conserve listed species.

## 8 **Alternative 3**

9 Under Alternative 3, the Services would not issue ITPs, but NMFS would make necessary  
10 findings under its existing 4(d) rule to provide authorization for take of threatened salmon  
11 and steelhead addressed by the rule when the take was incidental to forest practices  
12 described in the conservation plan. USFWS would adopt new 4(d) rules to provide similar  
13 incidental take authorization for bull trout. Take authorization under this alternative would  
14 not apply to endangered species or to species that may be listed in the future. Take  
15 authorization would not have a specific term and could be terminated under procedures  
16 provided in the relevant 4(d) rule, or by revocation of the rule itself. Because of these  
17 limitations on regulatory certainty, reduced stakeholder participation and support,  
18 especially for public funding of adaptive management and other program elements, would  
19 not be sufficient to fully implement the non-regulatory elements of the program.

## 20 **Alternative 4**

21 Under Alternative 4, the Services would issue ITPs to the State of Washington, based on  
22 implementation of a statewide FPHCP. The FPHCP would incorporate a set of Forest  
23 Practices Rules that are more protective than the current rules (which are based on the  
24 Forests and Fish Report and became effective in July 2001). The State is seeking ITPs  
25 from both of the Services, each for a term of 50 years. Alternative 4 would require action  
26 by the Washington State Legislature or a court order to initiate additional rule-making by  
27 the Forest Practices Board to increase protective measures in the rules. Because  
28 landowners would likely believe that the rules under Alternative 4 are overly protective,  
29 there would be substantially less stakeholder support and participation and public funding  
30 for adaptive management, associated monitoring, and other program elements that depend  
31 on landowner support and voluntary participation and public funding. However, because  
32 the rules likely would create less biological uncertainty, there is reduced need for an  
33 adaptive management program under this alternative.

## 34 **ANTICIPATED IMPACTS**

35 The anticipated environmental impacts associated with these alternatives are summarized  
36 in Table S-1 and are described in detail in Chapters 4 and 5.

### 37 **Environmentally Preferred Alternative**

38 The Services have identified Alternative 2 as the environmentally preferred alternative  
39 because it provides the most long-term protection and conservation for riparian and aquatic

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1 habitat for covered species. Under Alternative 2, riparian and aquatic habitat conservation  
2 measures are substantially improved as compared to Alternative 1 (No Action) Scenario 2.  
3 The Services expect the Adaptive Management Program under Alternative 2 to have the  
4 most participation by Forests and Fish stakeholders as compared with all other alternatives.  
5 The Services also expect the Adaptive Management Program to receive the most State and  
6 other funding under Alternative 2 as compared with all other alternatives. Further, the  
7 Services expect that under Alternative 2 landowners would be less likely to convert their  
8 forestlands to other, non-forestry uses that would take those lands out of the FPHCP  
9 covered land base as compared to Alternative 1 (No Action) Scenario 1, Alternative 3, and  
10 Alternative 4. For all of these reasons, the Services have determined that Alternative 2 is  
11 the environmentally preferred alternative.



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**Table S-1. Summary and Comparison of the Environmental Effects of the Alternatives.**

**NOTE: No Action** means that no Incidental Take Permits (ITP) or 4(d) take authorization would be issued. This lack of action could affect the Washington Forest Practices Rules in a way that is difficult to predict, and a range of outcomes could result. Therefore, two scenarios, which represent the endpoints of the reasonable range of possible outcomes for the Washington Forest Practices Rules, have been defined - see Chapter 2, subsection 2.3.1, Alternative 1 (No Action). Endpoints for this range of outcomes are referred to as Alternative 1-Scenario 1 and Alternative 1-Scenario 2. The effects of No Action are described in terms of these endpoints, but the actual outcome of effects is likely to fall somewhere in-between these two scenarios.

Criteria	No Action Alternative 1-Scenario 1 (Current Washington Forest Practices Rules remain in effect with adaptive management, funding, and stakeholder collaboration degrading over time)	No Action Alternative 1-Scenario 2 (Revert back to the Washington Forest Practices Rules in effect on January 1, 1999 with substantial reduction in adaptive management, funding, and stakeholder collaboration)	Alternative 2 (ITPs issued – current Washington Forest Practices Rules remain in effect with a fully funded adaptive management program and strong stakeholder collaboration)	Alternative 3 (Endangered Species Act, Section 4(d) Rules applied-current Washington State Forest Practices Rules remain in effect with some adaptive management, funding, and stakeholder collaboration)	Alternative 4 (ITPs issued, more restrictive Washington Forest Practices Rules in effect; adaptive management directed by the Washington Forest Practices Board)
<b>Adaptive Management</b>					
<b>Adaptive Management</b>	The effectiveness of adaptive management under Alternative 1-Scenario 1 would likely be only slightly higher than under Alternative 1-Scenario 2 due to reduced stakeholder participation and a resulting reduction in contributed resources and funding for implementation.	Adaptive management under Alternative 1-Scenario 2 would likely have lower effectiveness than under Alternative 1-Scenario 1. There would be a lack of stakeholder participation and support for public funding.	Alternative 2 would result in full potential of adaptive management effectiveness due to robust participation and support by stakeholders and collaborators. The effectiveness of adaptive management would be higher under Alternative 2 than under Alternative 1-Scenario 1 and substantially higher than under Alternative 1-Scenario 2.	The effectiveness of adaptive management under Alternative 3 would be higher than under Alternative 1-Scenario 1 and substantially higher than under Alternative 1-Scenario 2. Participation and support of stakeholders in adaptive management would be higher under Alternative 3 than Alternative 1-Scenarios 1 and 2.	Under Alternative 4 the effectiveness of adaptive management would be similar to Alternative 1-Scenario 1, but more effective than Alternative 1-Scenario 2, due to a lack of priorities, unknown funding, and uncertain decision-making at the conclusion of research efforts from low stakeholder participation.
<b>NOTE:</b> From this point forward, the reader should keep in mind the differences in the effectiveness of adaptive management over time, among the alternatives, due to stakeholder participation and funding. These differences will have resource effects, over time. Refer to subsection 4.1.5, Adaptive Management, for a full description.					
<b>Land Ownership and Use</b>					
<b>RMZ Lands with Use Restrictions</b>	Total RMZ area on western Washington private, city, and county lands would be higher than Alternative 1-Scenario 2 at approximately 1,322,000 acres. Total RMZ area on eastern Washington State, private, city, and county lands would also be higher than Alternative 1-Scenario 2 at approximately 374,000 acres.	Total RMZ area on western Washington private, city, and county lands would be lower than Alternative 1-Scenario 1 at approximately 631,000 acres. Total RMZ area on eastern Washington State, private, and county lands would also be lower than Alternative 1-Scenario 1 at approximately 196,000 acres.	Similar to Alternative 1-Scenario 1, the total RMZ area on affected lands under Alternative 2 would be higher than Alternative 1-Scenario 2 at approximately 1,322,000 acres in western Washington and 374,000 in eastern Washington.	Similar to Alternative 1-Scenario 1, the total RMZ area on affected lands under Alternative 3 would be higher than Alternative 1-Scenario 2 at approximately 1,322,000 acres in western Washington and 374,000 in eastern Washington.	Total RMZ area on affected lands under Alternative 4 would be higher than Alternative 1-Scenarios 1 and 2 at approximately 2,695,000 acres in western Washington and 871,000 in eastern Washington.
<b>Conversion of Non-Industrial Private Forestland to other Uses</b>	Conversion rates under Alternative 1-Scenario 1 would be higher than Alternative 1-Scenario 2 because of the greater economic impact on forest landowners and reduced funding for small landowner financial compensation programs.	Conversion rates would be lower under Alternative 1-Scenario 2 than Alternative 1-Scenario 1 because of the lesser economic impact on forest landowners due to narrower and fewer RMZ requirements.	Conversion rates under Alternative 2 may be only slightly higher than Alternative 1-Scenario 2 because of funding for small landowner financial compensation programs. Conversion rates would be lower compared with Alternative 1-Scenario 1 because of the regulatory certainty gained from ITPs issued.	Conversion rates under Alternative 3 would be lower compared to Alternative 1-Scenario 1 due to 4(d) take authorization, some regulatory certainty, and some amount of funding for small landowner financial compensation programs. Conversion rates would be higher than Alternative 1-Scenario 2 because there is no long-term regulatory certainty provided by 4(d) take authorization for the wider RMZs that would be required.	Conversion rates under Alternative 4 would be higher than either Alternative 1-Scenario 1 or Scenario 2 due to greater economic impacts on forest landowners from wider RMZ requirements, unstable slope buffers, RMAP schedule requirements, limits on road densities, and other restrictions.
<b>Air Quality</b>					
<b>Air Pollution from Harvest, Road Construction, and Fire Emissions from Wildfire and Prescribed Burning</b>	Alternative 1-Scenario 1 would likely result in less timber harvest than Alternative 1-Scenario 2 and therefore would be expected to result in slightly less air pollution and slightly higher levels of wildfire emissions due to a higher likelihood of wildfire.	Compared to Alternative 1-Scenario 1, Alternative 1-Scenario 2 would cause slightly higher levels of air pollution and slightly lower wildfire emissions due to higher levels of timber harvest and a lower likelihood of wildfire.	Alternative 2 would result in similar levels of air pollution as Alternative 1-Scenario 1 and slightly lower levels of air pollution compared to Alternative 1-Scenario 2 due to a lower level of timber harvest under Alternative 2 and slightly higher levels of wildfire emissions due to a higher likelihood of wildfire.	Alternative 3 would result in similar levels of air pollution as Alternative 1-Scenario 1 and slightly lower levels of air pollution compared to Alternative 1-Scenario 2 due to a lower level of timber harvest under Alternative 3 and slightly higher levels of wildfire emissions due to a higher likelihood of wildfire.	Alternative 4 would likely result in slightly lower amounts of air pollution from timber harvest and higher wildfire emissions due to lower timber harvests and a higher likelihood of wildfire than either Alternative 1-Scenario 1 or Scenario 2.
<b>Geology, Soils, and Erosional Processes</b>					
<b>Road Surface Erosion</b>	Alternative 1-Scenario 1 would provide more protection from road surface erosion than Alternative 1-Scenario 2 because of wider RMZs, RMAPs, improved BMPs, and better unstable slope protection.	Alternative 1-Scenario 2 would provide less protection from road surface erosion than Alternative 1-Scenario 1 because of narrower RMZs, less protective BMPs, and because RMAPs would be required only on a case-by-case basis and for some Watershed Analysis prescriptions.	Alternative 2 would provide a similar level of protection from road surface erosion as Alternative 1-Scenario 1. Like Alternative 1-Scenario 1, Alternative 2 would have wider RMZs, more protective BMPs, and require RMAPs as opposed to Alternative 1-Scenario 2.	Alternative 3 would provide a similar level of protection from road surface erosion as Alternative 1-Scenario 1. Like Alternative 1-Scenario 1, Alternative 2 would have wider RMZs, more protective BMPs, and require RMAPs as opposed to Alternative 1-Scenario 2.	Alternative 4 would provide substantially more protection than Alternative 1-Scenario 2, and somewhat more protection than Alternative 1-Scenario 1, from road surface erosion because Alternative 4 would have wider RMZs, a cap on road density, and a reduced time schedule for RMAP implementation.



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**Table S-1.** Summary and Comparison of the Environmental Effects of the Alternatives (continued).

Criteria	No Action Alternative 1-Scenario 1	No Action Alternative 1-Scenario 2	Alternative 2	Alternative 3	Alternative 4
<b>Hillslope Erosion Related to Timber Harvest<sup>1/</sup></b>	Alternative 1-Scenario 1 would result in a low likelihood of sediment delivery from hillslope erosion as compared to Alternative 1-Scenario 2. This alternative would provide close to full protection from hillslope erosion on Type S and F streams, due to wider RMZs, more protective BMPS, and RMAPs. There would be significantly less hillslope erosion, as compared to Alternative 1-Scenario 2 on Type N streams due to RMZs and Equipment Limitation Zones.	Alternative 1-Scenario 2 would result in a high likelihood of hillslope erosion entering streams, as compared with Alternative 1-Scenario 1, due to narrower, less abundant RMZs and the lack of RMZs and Equipment Limitation Zones on Type N streams.	Alternative 2 would provide similar protection from hillslope sediment as Alternative 1-Scenario 1. The result would be a low likelihood of sediment delivery from hillslope erosion as compared to Alternative 1-Scenario 2. Alternative 2 would provide close to full protection from hillslope erosion on Type S and F streams, due to wider RMZs, more protective BMPS, and RMAPs. There would be significantly less hillslope erosion, as compared to Alternative 1-Scenario 2 on Type N streams due to RMZs and Equipment Limitation Zones.	Alternative 3 would provide similar protection from hillslope sediment as Alternative 1-Scenario 1. The result would be a low likelihood of sediment delivery from hillslope erosion as compared to Alternative 1-Scenario 2. Alternative 3 would provide close to full protection from hillslope erosion on Type S and F streams due to wider RMZs, more protective BMPS, and RMAPs. There would be significantly less hillslope erosion, as compared to Alternative 1-Scenario 2 on Type N streams due to RMZs and Equipment Limitation Zones.	Alternative 4 would result in full protection from hillslope erosion compared with Alternative 1-Scenario 1 that would provide close to full protection and Alternative 1-Scenario 2 that provide substantially less protection. Alternative 4 would result in full protection due to wider and continuous RMZs on all streams.
<b>Road-related Landslides</b>	Compared to Alternative 1-Scenario 2, Alternative 1-Scenario 1 would result in a low likelihood of road related landslides because of wider RMZs, more protective BMPS, and RMAPs.	Alternative 1-Scenario 2 would result in a high likelihood of road related landslides as compared to Alternative 1-Scenario 1 because of narrower RMZs, less protective BMPS, and RMAPs would only be required on a case-by-case basis and for some Watershed Analysis prescriptions.	Alternative 2 would provide similar protection as Alternative 1-Scenario 1 and would result in a low likelihood of road related landslides as compared to Alternative 1-Scenario 2 because of wider RMZs, more protective BMPS, RMAPs, and training programs for identifying potentially unstable slopes.	Alternative 3 would provide similar protection as Alternative 1-Scenario 1 and would result in a low likelihood of road related landslides as compared to Alternative 1-Scenario 2 because of wider RMZs, more protective BMPS, RMAPs, and training programs for identifying potentially unstable slopes.	Alternative 4 would be substantially more protective than Alternative 1-Scenario 2 and somewhat more protective than Alternative 1-Scenario 1 for limiting road-related landslides because of a cap on road densities for large landowners, wider RMZs, more protective BMPS, a reduced time schedule for RMAPs, and a broader definition of potentially unstable slopes.
<b>Landslides Related to Timber Harvest</b>	Alternative 1-Scenario 1 would result in more protection of landslides related to timber harvest compared with Alternative 1-Scenario 2 because of wider RMZs, protective BMPS, and a more refined screening process for identifying unstable slopes.	Alternative 1-Scenario 2 would result in less protection of landslides related to timber harvest than Alternative 1-Scenario 1 because of narrower and fewer RMZs, and the unstable slope screening process would be less robust.	Alternative 2 would result in substantially more protection than Alternative 1-Scenario 2 and somewhat more protection than Alternative 1-Scenario 1 for landslides related to timber harvest because of wider RMZs, more protective BMPS, and a more refined screening process for unstable slopes, including a training program.	Alternative 3 would result in substantially more protection than Alternative 1-Scenario 2 and somewhat more protection than Alternative 1-Scenario 1 for landslides related to timber harvest because of wider RMZs, more protective BMPS, and a more refined screening process for unstable slopes, including a training program.	Alternative 4 would be more protective than Alternative 1-Scenarios 1 and 2 for limiting landslides related to timber harvest because of wider RMZs on all streams, more protective BMPS, and a broader definition of potentially unstable slopes.
<b>Bank Stability</b>	Alternative 1-Scenario 1 would provide complete protection of streambank stability on fish-bearing streams and more protection along non-fish-bearing streams compared to Alternative 1-Scenario 2. The increased protection is due to wider RMZs, Equipment Limitation Zones, and incidental protection through improved unstable slope screening, leave tree requirements, and protection of sensitive sites.	Alternative 1-Scenario 2 would have a low likelihood of adversely affecting streambank stability along fish-bearing streams because of selective harvest close to the streambank, as compared to Alternative 1-Scenario 1 that would provide complete protection of streambank stability. Alternative 1-Scenario 2 would provide little to no protection of bank stability along non-fish-bearing streams because of minimal RMZs in these areas compared with Alternative 1-Scenario 1.	Similar to Alternative 1-Scenario 1, Alternative 2 would offer complete protection of streambank stability on fish-bearing streams and more protection along non-fish-bearing streams compared to Alternative 1-Scenario 2. The increased protection is due to wider RMZs, Equipment Limitation Zones, and incidental protection through improved unstable slope screening, leave tree requirements, and protection of sensitive sites.	Similar to Alternative 1-Scenario 1, Alternative 3 would offer complete protection of streambank stability on fish-bearing streams and more protection along non-fish-bearing streams compared to Alternative 1-Scenario 2. The increased protection is due to wider RMZs, Equipment Limitation Zones, and incidental protection through improved unstable slope screening, leave tree requirements, and protection of sensitive sites.	Alternative 4 would offer more protection for all streams as compared to Alternative 1-Scenarios 1 and 2 due to wider RMZs along all streams, and a broader definition of unstable slopes.
<b>Water Resources</b>					
<b>Effects on Water Temperature</b>	Alternative 1-Scenario 1 would have a low likelihood of increasing stream temperatures compared to Alternative 1-Scenario 2 due to wider RMZs on all fish-bearing streams and some non fish-bearing streams.	Alternative 1-Scenario 2 has a low to moderate likelihood of increasing stream temperatures compared to Alternative 1-Scenario 1 due to narrower and less abundant RMZs.	Like Alternative 1-Scenario 1, Alternative 2 would have a low likelihood of increasing stream temperatures compared to Alternative 1-Scenario 2 due to wider RMZs.	Like Alternative 1-Scenario 1, Alternative 3 would have a low likelihood of increasing stream temperatures compared to Alternative 1-Scenario 2 due to wider RMZs.	Alternative 4 would have a lower likelihood than either Alternative 1-Scenario 1 or 2 of increasing stream temperatures due to wider RMZs along all stream types.

<sup>1/</sup> See Appendix B, Riparian Modeling and Assumptions, for a description of EBAI values.



**Table S-1.** Summary and Comparison of the Environmental Effects of the Alternatives (continued).

Criteria	No Action Alternative 1-Scenario 1	No Action Alternative 1-Scenario 2	Alternative 2	Alternative 3	Alternative 4
<b>Effects on Sediment-related to Water Quality</b>	Alternative 1-Scenario 1 would be more protective than Alternative 1-Scenario 2 for limiting water quality problems related to sedimentation because of wider RMZs, Channel Migration Zones, Equipment Limitation Zones, RMAPs, and greater environmental review of potentially unstable slopes.	Alternative 1-Scenario 2 would be less protective than Alternative 1-Scenario 1 for limiting water quality problems related to sedimentation because of narrower RMZs, and the lack of RMAPs except on a case-by-case basis and for some Watershed Analysis prescriptions.	Similar to Alternative 1-Scenario 1, Alternative 2 would be more protective than Alternative 1-Scenario 2 for limiting water quality problems related to sedimentation because of wider RMZs, Channel Migration Zones, Equipment Limitation Zones, RMAPs, and greater environmental review of potentially unstable slopes.	Similar to Alternative 1-Scenario 1, Alternative 3 would be more protective than Alternative 1-Scenario 2 for limiting water quality problems related to sedimentation because of wider RMZs, Channel Migration Zones, Equipment Limitation Zones, RMAPs, and greater environmental review of potentially unstable slopes.	Alternative 4 would be more protective than either Alternative 1-Scenario 1 or 2 for limiting water quality problems related to sedimentation because of wider RMZs, a shorter time schedule for RMAPs, and a cap on road density.
<b>Effects on Contaminant Levels</b>	Alternative 1-Scenario 1 would provide more protection of water from contaminants than Alternative 1-Scenario 2, due to wider RMZs, improved BMPs, and variable chemical buffer widths based on conditions and application equipment to reduce pesticide drift to streams. Alternative 1-Scenario 1 is expected to result in similar but slightly less impact to groundwater aquifers as compared to Alternative 1-Scenario 2.	Alternative 1-Scenario 2 would provide less protection of water from contaminants than Alternative 1-Scenario 1 due to narrower RMZs and less explicit BMPs. Surface waters could be contaminated by pesticides under this Alternative. However, Alternative 1-Scenario 2 is not expected to result in substantial impacts on aquifers.	Like Alternative 1-Scenario 1, Alternative 2 would provide more protection of water from contaminants than Alternative 1-Scenario 2, due to wider RMZs, improved BMPs, and variable chemical buffer widths based on conditions and application equipment to reduce pesticide drift to streams. Like Alternative 1-Scenario 1, Alternative 2 is expected to result in similar but slightly less impact to groundwater aquifers as compared to Alternative 1-Scenario 2.	Like Alternative 1-Scenario 1, Alternative 3 would provide more protection of water from contaminants than Alternative 1-Scenario 2, due to wider RMZs, improved BMPs, and variable chemical buffer widths based on conditions and application equipment to reduce pesticide drift to streams. Like Alternative 1-Scenario 1, Alternative 3 is expected to result in similar but slightly less impact to groundwater aquifers as compared to Alternative 1-Scenario 2.	Alternative 4 would provide more protection of water from contaminants than either Alternative 1-Scenario 1 or 2 due to wider RMZs, improved BMPs, wider chemical buffer widths on all streams including dry streambeds. Groundwater impacts from pesticide use under Alternative 4 are expected to be nearly identical to impacts under Alternative 1-Scenario 1.
<b>Timber Harvest Influence on Peak Flows</b>	Alternative 1-Scenario 1 would have a slightly lower effect on peak flows as compared to Alternative 1-Scenario 2 because of wider RMZs on more streams.	Alternative 1-Scenario 2 would have a moderate likelihood of increased peak flows as compared to Alternative 1-Scenario 1 because of narrower RMZs on less streams.	Like Alternative 1-Scenario 1, Alternative 2 could have a slightly lower effect on peak flows as compared to Alternative 1-Scenario 2 because of wider RMZs on more streams.	Like Alternative 1-Scenario 1, Alternative 3 could have a slightly lower effect on peak flows as compared to Alternative 1-Scenario 2 because of wider RMZs on more streams.	Alternative 4 would provide more protection from potential management effects related to peak flows than either Alternative 1-Scenario 1 or 2. Unique to Alternative 4 would be a landscape rule requiring a minimum of two-thirds of lands by ownership be maintained as hydrologically mature forest within watershed rain-on-snow zones larger than 1,000 acres. Additionally, a new eastside hydrology module would be developed as part of Watershed Analysis.
<b>Road Influence on Peak Flows</b>	Compared to Alternative 1-Scenario 2, Alternative 1-Scenario 1 would reduce the road surface drainage and the potential of road influences on peak flows due to revised road BMPs, additional RMZ requirements, and RMAPs.	Compared to Alternative 1-Scenario 1, Alternative 1-Scenario 2 would likely increase the road surface drainage and the potential of road influences on peak flows because RMAPs would only be required on a case-by-case basis, which would likely result in delays in fixing road problems, thus affecting peak flows over time.	Alternative 2 would have a similar protection level to Alternative 1-Scenario 1. Compared to Alternative 1-Scenario 2, Alternative 2 would reduce the road surface drainage and the potential of road influences on peak flows due to revised road BMPs, additional RMZ requirements, and RMAPs.	Alternative 3 would have a similar protection level to Alternative 1-Scenario 1. Compared to Alternative 1-Scenario 2, Alternative 3 would reduce the road surface drainage and the potential of road influences on peak flows due to revised road BMPs, additional RMZ requirements, and RMAPs.	Alternative 4 would be less likely than either Alternative 1-Scenario 1 or 2 to have an effect on peak flows because there would be no net increase in roads for large landowners and a shorter time schedule for RMAPs.
<b>Vegetation</b>					
<b>Effects on Riparian Vegetation</b>	Alternative 1-Scenario 1 would be less likely than Alternative 1-Scenario 2 to negatively affect riparian vegetation due to wider RMZs. Alternative 1-Scenario 1 would likely result in 20 percent of covered lands on the westside of the State developing late-seral forest characteristics and 9 percent on the eastside of the State.	Alternative 1-Scenario 2 would be more likely than Alternative 1-Scenario 1 to negatively affect riparian vegetation due to narrower RMZs. Alternative 1-Scenario 2 would likely result in 9 percent of covered lands on the westside of the State developing late-seral forest characteristics and 5 percent on the eastside of the State.	Like Alternative 1-Scenario 1, Alternative 2 would be less likely than Alternative 1-Scenario 2 to negatively affect riparian vegetation due to wider RMZs and would result in 20 percent of covered lands on the westside of the State developing late-seral forest characteristics and 9 percent on the eastside of the State.	Like Alternative 1-Scenario 1, Alternative 3 would be less likely than Alternative 1-Scenario 2 to negatively affect riparian vegetation due to wider RMZs and would result in 20 percent of covered lands on the westside of the State developing late-seral forest characteristics and 9 percent on the eastside of the State.	Alternative 4 would be less likely than either Alternative 1-Scenario 1 or 2 to negatively affect riparian vegetation due to wider RMZs, resulting in 41 percent of covered lands on the westside of the State developing late-seral forest characteristics and 25 percent on the eastside of the State.



# Summary

**Table S-1.** Summary and Comparison of the Environmental Effects of the Alternatives (continued).

Criteria	No Action Alternative 1-Scenario 1	No Action Alternative 1-Scenario 2	Alternative 2	Alternative 3	Alternative 4
<b>Effects on Wildfire</b>	Alternative 1-Scenario 1 may slightly increase the short-term fire potential compared with Alternative 1-Scenario 2 due to wider RMZs, thus increasing the area with standing trees and snags adjacent to harvest slash.	Alternative 1-Scenario 2 would result in a reduced, short-term fire potential compared with Alternative 1-Scenario 1 due to narrower RMZs, thus more harvest and reduced areas with standing trees and snags adjacent to harvest slash.	Similar to Alternative 1-Scenario 1, Alternative 2 may slightly increase the short-term fire potential from Alternative 1-Scenario 2 due to wider RMZs, thus increasing the area with standing trees and snags adjacent to harvest slash.	Similar to Alternative 1-Scenario 1, Alternative 3 may slightly increase the short-term fire potential from Alternative 1-Scenario 2 due to wider RMZs, thus increasing the area with standing trees and snags adjacent to harvest slash.	The short- and long-term potential of wildfire under Alternative 4 would be higher than either Alternative 1-Scenario 1 or 2 due to wider RMZs, thus increasing the area with standing trees and snags adjacent to harvest slash.
<b>Effects on Threatened, Endangered, and Species of Concern (TES) Plants</b>	Under Alternative 1-Scenario 1, TES plants would receive some incidental protection from wider RMZs and sensitive site and unstable slope protections compared with Alternative 1-Scenario 2.	Alternative 1-Scenario 2 would result in less protection for TES plants than Alternative 1-Scenario 1 because of narrower RMZs and less protection for sensitive sites and unstable slopes.	Similar to Alternative 1-Scenario 1, Alternative 2 would result in some incidental protection for TES plants from wider RMZs and sensitive site and unstable slope protections compared with Alternative 1-Scenario 2.	Similar to Alternative 1-Scenario 1, Alternative 3 would result in some incidental protection for TES plants from wider RMZs and sensitive site and unstable slope protections compared with Alternative 1-Scenario 2.	Alternative 4 would provide more protection than either Alternative 1-Scenario 1 or 2 due to wider RMZs on all streams.
<b>Riparian Processes</b>					
<b>Effects on Large Woody Debris (LWD) Recruitment</b>	Alternative 1-Scenario 1 would provide more LWD recruitment than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams and additional RMZs on non-fish-bearing streams, protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 1-Scenario 2, would provide less LWD recruitment than Alternative 1-Scenario 1, due to narrower RMZs on fish-bearing streams, minimal to no RMZs on non-fish-bearing streams, allowable harvest within the RMZs, and potentially more roads in the RMZs.	Alternative 2 would provide similar LWD recruitment as Alternative 1-Scenario 1 and more LWD recruitment than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams and additional RMZs on non-fish-bearing streams, protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 3 would provide similar LWD recruitment as Alternative 1-Scenario 1 and more LWD recruitment than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams and additional RMZs on non-fish-bearing streams, protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 4 would provide more LWD recruitment than either Alternative 1-Scenario 1 or 2 due to wider and more continuous RMZs, and protection of Channel Migration Zones, Channel Disturbance Zones, and Beaver Habitat Zones.
<b>Effects on Stream Shade</b>	Alternative 1-Scenario 1 would provide more shade than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams and additional RMZs on non-fish-bearing streams, protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 1-Scenario 2 would provide less shade than Alternative 1-Scenario 1 due to narrower RMZs on fish-bearing streams, allowable harvest within the RMZs, lack of RMZs on non-fish-bearing streams, and potentially more roads in the RMZs.	Alternative 2 would provide similar shade as Alternative 1-Scenario 1 and more shade than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams and additional RMZs on non-fish-bearing streams, protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 3 would provide similar shade as Alternative 1-Scenario 1 and more shade than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams and additional RMZs on non-fish-bearing streams, protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 4 would provide more shade than either Alternative 1-Scenario 1 or 2 due to wider and more abundant RMZs, and protection of Channel Migration Zones, Channel Disturbance Zones, and Beaver Habitat Zones.
<b>Effects on Leaf and Needle Litter Production</b>	Alternative 1-Scenario 1 would provide more leaf and needle litter production than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams and additional RMZs on non-fish-bearing streams, protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 1-Scenario 2 would provide less leaf and needle litter production than Alternative 1-Scenario 1 due to narrower RMZs on fish-bearing streams, allowable harvest within the RMZs, lack of RMZs on non-fish-bearing streams, and potentially more roads in the RMZs.	Alternative 2 would provide similar leaf and needle litter production as Alternative 1-Scenario 1 and more litter production than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams and additional RMZs on non-fish-bearing streams, protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 3 would provide similar leaf and needle litter production as Alternative 1-Scenario 1 and more litter production than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams and additional RMZs on non-fish-bearing streams, protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 4 would provide more leaf and needle litter production than either Alternative 1-Scenario 1 or 2 due to wider and more abundant RMZs, and protection of Channel Migration Zones, Channel Disturbance Zones, and Beaver Habitat Zones.
<b>Effects on Microclimate</b>	Unlike Alternative 1-Scenario 2, Alternative 1-Scenario 1 would maintain the microclimate along fish-bearing streams in Site Class II and III areas due to wider RMZs. Protection would be less than full along fish-bearing Site Class I, IV, and V streams and on Type N streams but would still be higher than the protection provided by Alternative 1-Scenario 2 along these same streams.	Alternative 1-Scenario 2 would likely result in moderate to high impacts to microclimate along all streams due to narrower RMZs compared with Alternative 1-Scenario 1. Specifically, the results would likely be higher air temperatures and reduced humidity than found under Alternative 1-Scenario 1.	Similar to Alternative 1-Scenario 1, Alternative 2 would maintain the microclimate along fish-bearing streams in Site Class II and III areas due to wider RMZs, unlike Alternative 1-Scenario 2. Similar to Alternative 1-Scenario 1, protection would be less than full along fish bearing Site Class I, IV, and V streams and on Type N streams but would still be higher than the protection provided by Alternative 1-Scenario 2 along these same streams.	Similar to Alternative 1-Scenario 1, Alternative 3 would maintain the microclimate along fish-bearing streams in Site Class II and III areas due to wider RMZs, unlike Alternative 1-Scenario 2. Similar to Alternative 1-Scenario 1 protection would be less than full along fish bearing Site Class I, IV, and V streams and on Type N streams but would still be higher than the protection provided by Alternative 1-Scenario 2 along these same streams.	Alternative 4 would provide more protection of microclimate than either Alternative 1-Scenario 1 or 2 due to wider RMZs.



**Table S-1.** Summary and Comparison of the Environmental Effects of the Alternatives (continued).

Criteria	No Action Alternative 1-Scenario 1	No Action Alternative 1-Scenario 2	Alternative 2	Alternative 3	Alternative 4
<b>Bank Stability</b>	Alternative 1-Scenario 1 would offer complete protection of streambank stability on fish-bearing streams and more protection along non-fish-bearing streams compared to Alternative 1-Scenario 2. The increased protection is due to wider RMZs and Equipment Limitation Zone requirements and incidental protection through improved unstable slope screening, leave tree requirements, and protection of sensitive sites.	Alternative 1-Scenario 2 has the potential, though it is low, to adversely affect streambank stability along fish-bearing streams as compared to Alternative 1-Scenario 1 because selective harvest would be allowed close to the streambank. Alternative 1-Scenario 2 would provide little to no protection of bank stability along non-fish-bearing streams because of minimal RMZs in these areas.	Similar to Alternative 1-Scenario 1, Alternative 2 would offer complete protection of streambank stability on fish-bearing streams and more protection along non-fish-bearing streams compared to Alternative 1-Scenario 2. The increased protection is due to wider RMZs and Equipment Limitation Zone requirements and incidental protection through improved unstable slope screening, leave tree requirements, and protection of sensitive sites.	Similar to Alternative 1-Scenario 1, Alternative 3 would offer complete protection of streambank stability on fish-bearing streams and more protection along non-fish-bearing streams compared to Alternative 1-Scenario 2. The increased protection is due to wider RMZs and Equipment Limitation Zone requirements and incidental protection through improved unstable slope screening, leave tree requirements, and protection of sensitive sites.	Alternative 4 would offer more protection for all streams compared to either Alternative 1-Scenario 1 or 2 due to wider RMZs along all streams, and a broader definition of unstable slopes.
<b>Sediment Filtration</b>	Alternative 1-Scenario 1 would be more protective than Alternative 1-Scenario 2 for limiting fine sediment delivery to streams because of wider RMZs, RMAPs and greater unstable slope protection.	Alternative 1-Scenario 2 would be less protective compared with Alternative 1-Scenario 1 for limiting fine sediment delivery to streams because of narrower RMZs, and the lack of RMAP requirements, except on a case-by-case basis and for some Watershed Analysis prescriptions.	Similar to Alternative 1-Scenario 1, Alternative 2 would be more protective than Alternative 1-Scenario 2 for limiting fine sediment delivery to streams because of wider RMZs, RMAPs, and greater unstable slope protection.	Similar to Alternative 1-Scenario 1, Alternative 3 would be more protective than Alternative 1-Scenario 2 for limiting fine sediment delivery to streams because of wider RMZs, RMAPs, and greater unstable slope protection.	Alternative 4 would be substantially more protective than Alternative 1-Scenario 2 and somewhat more protective than Alternative 1-Scenario 1 for limiting fine sediment delivery to streams because of wider RMZs, a reduced time schedule for RMAP implementation, a cap on road density and more restrictive unstable slope screening and thus protection.
<b>Wetlands</b>					
<b>Effects on Non-forested Wetlands</b>	Alternative 1-Scenario 1 would provide levels of protection to non-forested wetlands similar to Alternative 1-Scenario 2. However, Alternative 1-Scenario 1 could protect more wetlands adjacent to streams because of wider RMZs and the protection of Channel Migration Zones than Alternative 1-Scenario 2.	Alternative 1-Scenario 2 would provide levels of protection to non-forested wetlands similar to Alternative 1-Scenario 1. However, Alternative 1-Scenario 2 could provide less protection to wetlands adjacent to streams because of narrower RMZs and Channel Migration Zones would generally not be protected.	Alternative 2 would provide levels of protection to non-forested wetlands similar to Alternative 1-Scenarios 1 and 2. However, Alternative 2 could protect more wetlands adjacent to streams because of wider RMZs and the protection of Channel Migration Zones than Alternative 1-Scenario 2.	Alternative 3 would provide levels of protection to non-forested wetlands similar to Alternative 1-Scenarios 1 and 2. However, Alternative 3 could protect more wetlands adjacent to streams because of wider RMZs and the protection of Channel Migration Zones than Alternative 1-Scenario 2.	Alternative 4 would provide more protection to non-forested wetlands than either Alternative 1-Scenario 1 or 2 because a new wetland classification system would be adopted, and wider wetland management zones would be applied. In addition wider RMZs and the protection of Channel Migration Zones could capture and protect more wetlands that fall within them.
<b>Effects on Forested Wetlands</b>	As with Alternative 1-Scenario 2, Alternative 1-Scenario 1 would generally not protect forested wetlands, though restrictions may apply in some instances. However, Alternative 1-Scenario 1 would protect more forested wetlands within the wider RMZs and Channel Migration Zones than Alternative 1-Scenario 2.	As with Alternative 1-Scenario 1, Alternative 1-Scenario 2 would generally not protect forested wetlands. However, Alternative 1-Scenario 2 would protect less forested wetlands within the narrower RMZs and also due to no protection of Channel Migration Zones compared with Alternative 1-Scenario 1.	As with either Alternative 1-Scenario 1 or 2, Alternative 2 would generally not protect forested wetlands, though restrictions may apply in some instances. However, Alternative 2, similar to Alternative 1-Scenario 1, would protect more forested wetlands within the wider RMZs and Channel Migration Zones than Alternative 1-Scenario 2.	As with either Alternative 1-Scenario 1 or 2, Alternative 3 would generally not protect forested wetlands, though restrictions may apply in some instances. However, Alternative 3, similar to Alternative 1-Scenario 1, would protect more forested wetlands within the wider RMZs and Channel Migration Zones than Alternative 1-Scenario 2.	Alternative 4 would provide more protection of forested wetlands than either Alternative 1-Scenario 1 or 2 due to a 100-foot managed Wetland Management Zone on forested wetlands and the retention of 70 percent of canopy closure, understory vegetation, snags, and non-merchantable trees within the forested wetland.
<b>Fish and Fish Habitat</b>					
<b>Effects of Coarse Sediment on Fish Habitat</b>	Alternative 1-Scenario 1 would result in more protection of fish habitat from coarse sediment than Alternative 1-Scenario 2 because of wider RMZs, BMPs would be substantially strengthened, RMAPs would be required, and there would be a more refined screening process for identifying unstable slopes.	Alternative 1-Scenario 2 would result in less protection of fish habitat from coarse sediment than Alternative 1-Scenario 1 because of narrower RMZs, BMPs would not be adequate to address road construction and placement, and RMAPs would only be required on a case-by-case basis and for some Watershed Analysis prescriptions.	Alternative 2 would provide similar levels of protection as Alternative 1-Scenario 1 and would result in more protection of fish habitat from coarse sediment than Alternative 1-Scenario 2 because of wider RMZs, BMPs would be substantially strengthened, RMAPs would be required, and there would be a more refined screening process for identifying unstable slopes. Also, training programs would be implemented for identifying potentially unstable slopes.	Alternative 3 would provide similar levels of protection as Alternative 1-Scenario 1 and would result in more protection of fish habitat from coarse sediment than Alternative 1-Scenario 2 because of wider RMZs, BMPs would be substantially strengthened, RMAPs would be required, and there would be a more refined screening process for identifying unstable slopes.	Alternative 4 would result in more protection of fish habitat from introduction of coarse sediment than either Alternative 1-Scenario 1 or 2 because potentially unstable slopes would be more broadly defined and wider RMZs would occur on all fish-bearing and non-fish-bearing streams.



# Summary

**Table S-1.** Summary and Comparison of the Environmental Effects of the Alternatives (continued).

Criteria	No Action Alternative 1-Scenario 1	No Action Alternative 1-Scenario 2	Alternative 2	Alternative 3	Alternative 4
<b>Effects of Fine Sediment on Fish Habitat</b>	Alternative 1-Scenario 1 would result in substantially less fine sediment delivery to fish-bearing streams than Alternative 1-Scenario 2 because of wider RMZs, BMPs would be substantially strengthened, and RMAPs would be required.	Alternative 1-Scenario 2 would result in substantially more fine sediment delivery to fish-bearing streams than Alternative 1-Scenario 1 because of narrower RMZs, and RMAPs would not be required, except on a case-by-case basis and for some Watershed Analysis prescriptions.	Alternative 2 would be similar to Alternative 1-Scenario 1 in substantially reducing the amount of fine sediment delivery to fish-bearing streams compared to Alternative 1-Scenario 2 because of wider RMZs, BMPs would be substantially strengthened, RMAPs would be required, and there would be unstable slope training programs.	Alternative 3 would be similar to Alternative 1-Scenario 1 in substantially reducing fine sediment delivery to fish-bearing streams compared to Alternative 1-Scenario 2 because of wider RMZs, BMPs would be substantially strengthened, and RMAPs would be required.	Alternative 4 would result in more protection than either Alternative 1-Scenario 1 or 2 in reducing fine sediment delivery to fish-bearing streams because of wider RMZs, the requirement that there would be no net increase in roads for large landowners, a reduced time schedule for RMAPs implementation (than Alternative 1-Scenario 1), and a broader definition of potentially unstable slopes.
<b>Effects of Hydrology on Fish Habitat (Peak Flows)</b>	Alternative 1-Scenario 1 would provide more protection than Alternative 1-Scenario 2 against peak flow increases due to wider RMZs, and the protection of Channel Migration Zones, sensitive sites, and unstable slopes.	Alternative 1-Scenario 2 would provide less protection than Alternative 1-Scenario 1 against peak flow increases due to narrower RMZs and no protection of Channel Migration Zones, and less protection of sensitive sites or unstable slopes. Under this Alternative, protection against peak flows would occur through Watershed Analysis or by limiting the size of clearcuts in rain-on-snow zones.	Alternative 2 would be similar to Alternative 1-Scenario 1 in providing more protection than Alternative 1-Scenario 2 against peak flow increases due to wider RMZs, and the protection of Channel Migration Zones, sensitive sites, and unstable slopes.	Alternative 3 would be similar to Alternative 1-Scenario 1 in providing more protection than Alternative 1-Scenario 2 against peak flow influences due to wider RMZs, and the protection of Channel Migration Zones, sensitive sites, and unstable slopes.	Alternative 4 would result in more protection than either Alternative 1-Scenario 1 or 2 against peak flow increases due to wider RMZs, a cap on road density, a landscape rule with minimum requirements for hydrological maturity in rain-on-snow zones, and a new eastside hydrology module to be part of Watershed Analysis.
<b>Effects of Large Woody Debris (LWD) on Fish Habitat</b>	Alternative 1-Scenario 1 would provide more opportunity for LWD recruitment than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 1-Scenario 2 would provide less opportunity for LWD recruitment than Alternative 1-Scenario 1 due to narrower RMZs on fish-bearing streams, allowable harvest within the RMZs, lack of RMZs on non-fish-bearing streams, and potentially more roads in the RMZs.	Alternative 2 would provide similar opportunity for LWD recruitment as Alternative 1-Scenario 1 and more opportunity for LWD recruitment than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 3 would provide similar opportunity for LWD recruitment as Alternative 1-Scenario 1 and more opportunity for LWD recruitment than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 4 would provide more opportunity for LWD recruitment than Alternative 1-Scenario 1, and substantially more than Alternative 1-Scenario 2, due to wider and more abundant RMZs, and the protection of Channel Migration Zones, Channel Disturbance Zones, and Beaver Habitat Zones
<b>Effects of Leaf and Needle Litter Recruitment on Fish Habitat</b>	Alternative 1-Scenario 1 would provide more leaf and needle litter production that is beneficial to fish habitat than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams and additional RMZs on non-fish-bearing streams, the protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 1-Scenario 2 would provide less leaf and needle litter production that is beneficial to fish habitat than Alternative 1-Scenario 1 due to narrower RMZs on fish-bearing streams, allowable harvest within the RMZs, lack of RMZs on non-fish-bearing streams, and potentially more roads in the RMZs.	Alternative 2 would provide similar protection for leaf and needle litter production that is beneficial to fish habitat as Alternative 1-Scenario 1, and more litter production than Alternative 1-Scenario 2, due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, the protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 3 would provide similar protection for leaf and needle litter production that is beneficial to fish habitat as Alternative 1-Scenario 1, and more litter production than Alternative 1-Scenario 2, due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, the protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 4 would provide more leaf and needle litter protection that is beneficial to fish habitat than Alternative 1-Scenario 1, and substantially more than Alternative 1-Scenario 2, due to wider and more abundant RMZs, and the protection of Channel Migration Zones, Channel Disturbance Zones, and Beaver Habitat Zones.
<b>Effects on Floodplains, Off-Channel Areas, and Hyporheic Zone</b>	Alternative 1-Scenario 1 would provide a higher level of protection than Alternative 1-Scenario 2 for floodplains, off-channel areas, and hyporheic zones, and thus, fish habitat, due to wider RMZs and the protection of Channel Migration Zones.	Alternative 1-Scenario 2 would provide less protection than Alternative 1-Scenario 2 for floodplains, off-channel areas, and hyporheic zones, and thus, fish habitat, than Alternative 1-Scenario 1 due to narrower RMZs and no protection for Channel Migration Zones.	Alternative 2 would provide a similar level of protection for floodplains, off-channel areas, and hyporheic zones, and thus, fish habitat, as Alternative 1-Scenario 1 and a higher level of protection than Alternative 1-Scenario 2 due to wider RMZs and the protection of Channel Migration Zones.	Alternative 3 would provide a similar level of protection for floodplains, off-channel areas, and hyporheic zones, and thus, fish habitat, as Alternative 1-Scenario 1 and a higher level of protection than Alternative 1-Scenario 2 due to wider RMZs and the protection of Channel Migration Zones.	Alternative 4 would provide more protection for floodplains, off-channel areas, and hyporheic zones, and thus, fish habitat, than either Alternative 1-Scenario 1 or 2 due to wider and more abundant RMZs, and the additional protection to Beaver Habitat Zones and Channel Disturbance Zones.
<b>Lakes, Reservoirs, and Nearshore Marine Environments</b>	Alternative 1-Scenario 1 would provide more protection of fish habitat relative to lake, reservoir, and nearshore marine environments than Alternative 1-Scenario 2 due to higher LWD recruitment potential and full sediment filtration from wider RMZs.	Alternative 1-Scenario 2 would provide less protection of fish habitat relative to lake, reservoir, and nearshore marine environments than Alternative 1-Scenario 1 due to lower LWD recruitment potential and less sediment filtration from narrower RMZs.	Alternative 2 would provide similar protection of fish habitat relative to lake, reservoir, and nearshore marine environments as Alternative 1-Scenario 1, and more protection than Alternative 1-Scenario 2, due to higher LWD recruitment potential and full sediment filtration from wider RMZs.	Alternative 3 would provide similar protection of fish habitat relative to lake, reservoir, and nearshore marine environments as Alternative 1-Scenario 1, and more protection than Alternative 1-Scenario 2, due to higher LWD recruitment potential and full sediment filtration from wider RMZs.	Alternative 4 would provide more protection of fish habitat relative to lake, reservoir, and nearshore marine environments than either Alternative 1-Scenario 1 or 2 due to higher LWD recruitment potential and full sediment filtration from wider RMZs. Also, a reduced time schedule for RMAPs, a cap on road density, and better unstable slope protection would reduce sediment potential.



**Table S-1.** Summary and Comparison of the Environmental Effects of the Alternatives (continued).

Criteria	No Action Alternative 1-Scenario 1	No Action Alternative 1-Scenario 2	Alternative 2	Alternative 3	Alternative 4
<b>Effects of Water Temperature on Fish</b>	Alternative 1-Scenario 1 would provide more shade than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, the protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 1-Scenario 2 would provide less shade than Alternative 1-Scenario 1 due to narrower RMZs on fish-bearing streams, allowable harvest within the RMZs, a lack of RMZs on non-fish-bearing streams, and potentially more roads in the RMZs.	Alternative 2 would provide similar protection for shade as Alternative 1-Scenario 1, and more shade than Alternative 1-Scenario 2, due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, the protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 3 would provide similar shade protection as Alternative 1-Scenario 1, and more protection than Alternative 1-Scenario 2, due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, the protection of Channel Migration Zones, and fewer roads in the RMZs.	Alternative 4 would provide more shade protection than either Alternative 1-Scenario 1 or 2 due to wider and more abundant RMZs on all streams, and the protection of Channel Migration Zones, Channel Disturbance Zones, and Beaver Habitat Zones.
<b>Effects of Forest Chemicals on Fish</b>	Alternative 1-Scenario 1 would provide more protection of fish habitat from forest chemicals than Alternative 1-Scenario 2 due to wider RMZs, improved BMPs, and variable chemical application buffer widths based on conditions and application equipment to reduce pesticide drift to streams.	Alternative 1-Scenario 2 would provide less protection of fish habitat from forest chemicals than Alternative 1-Scenario 1 due to narrower RMZs and less explicit BMPs. Surface waters could be contaminated by pesticides under this Alternative.	Alternative 2 would provide similar protection of fish habitat from forest chemicals as Alternative 1-Scenario 1, and more protection than Alternative 1-Scenario 2, due to wider RMZs, improved BMPs, and variable chemical buffer widths based on conditions and application equipment to reduce pesticide drift to streams.	Alternative 3 would provide similar protection of fish habitat from forest chemicals as Alternative 1-Scenario 1, and more protection than Alternative 1-Scenario 2, due to wider RMZs, improved BMPs, and variable chemical buffer widths based on conditions and application equipment to reduce pesticide drift to streams.	Alternative 4 would provide more protection of fish habitat from forest chemicals than either Alternative 1-Scenario 1 or 2 due to wider RMZs on all streams, improved BMPs, and wider chemical buffer widths on all streams including dry streambeds.
<b>Effects on Fish Passage</b>	Alternative 1-Scenario 1 would provide more protection of fish passage than Alternative 1-Scenario 2 because of wider RMZs, a new stream typing model to identify fish habitat streams, and because RMAPs would be required, which would provide for systematic upgrading of non-functioning culverts that impede passage.	Fish passage would receive less protection under Alternative 1-Scenario 2 than under Alternative 1-Scenario 1 because RMAPs are not required, which means there is no systematic upgrade of non-functioning culverts that impede passage. Also, the stream typing system could misclassify fish habitat as non-fish habitat.	Alternative 2 would provide similar protection of fish passage as Alternative 1-Scenario 1, and would provide more protection than Alternative 1-Scenario 2, because of wider RMZs, a new stream typing model to identify fish habitat streams, and because RMAPs would be required, which would provide for systematic upgrading of non-functioning culverts that impede passage.	Alternative 3 would provide similar protection of fish passage as Alternative 1-Scenario 1, and would provide more protection than Alternative 1-Scenario 2, because of wider RMZs, a new stream typing model to identify fish habitat streams, and because RMAPs would be required, which would provide for systematic upgrading of non-functioning culverts that impede passage.	Alternative 4 would provide more protection of fish passage than either Alternative 1-Scenario 1 or 2 due to wider RMZs, a new stream typing model that would better protect fish habitat, and because RMAPs would be completed 5 years earlier than under Alternative 1-Scenario 1.
<b>Amphibians and Other Wildlife</b>					
<b>Effects on Amphibians Microhabitat Variables</b>	Unlike Alternative 1-Scenario 2, Alternative 1-Scenario 1 would provide full amphibian microhabitat protection along fish-bearing streams in Site Class II and III areas, and would come close to providing full microhabitat protection in Site Class I, IV, and V areas due to wider RMZs on fish-bearing streams. On Type N streams, protection would be less than optimal but would provide more than Alternative 1-Scenario 2 due to RMZs on some non-fish-bearing streams.	Alternative 1-Scenario 2 would provide less amphibian microhabitat protection than Alternative 1-Scenario 1 due to narrower RMZs on fish-bearing streams and a lack of RMZs on non-fish-bearing streams.	Alternative 2 would maintain similar microhabitat protection as Alternative 1-Scenario 1, and more protection compared to Alternative 1-Scenario 2, due to wider RMZs on fish-bearing streams and RMZs on some non-fish-bearing streams.	Alternative 3 would maintain similar microhabitat protection as Alternative 1-Scenario 1, and more protection compared to Alternative 1-Scenario 2, due to wider RMZs on fish-bearing streams and RMZs on some non-fish-bearing streams.	Alternative 4 would provide more protection microhabitat protection than Alternative 1-Scenario 1 and substantially more than Alternative 1-Scenario 2 due to wider RMZs on all streams.
<b>Effects on Unique Amphibian Habitats</b>	Under Alternative 1-Scenario 1, wider RMZs on fish-bearing streams, additional RMZs on Type N streams, and sensitive site buffers would provide more protection for unique amphibian habitats than Alternative 1-Scenario 2.	Alternative 1-Scenario 2 would provide less protection of unique amphibian habitats compared with Alternative 1-Scenario 1 due to narrower RMZs on fish-bearing streams, a lack of RMZs on non-fish-bearing streams, and no sensitive site buffers.	Alternative 2 would provide similar protection of unique amphibian habitats as Alternative 1-Scenario 1, and more protection than Alternative 1-Scenario 2, due to wider RMZs on fish-bearing streams, additional RMZs on Type N streams, and sensitive site buffers.	Alternative 3 would provide similar protection of unique amphibian habitats as Alternative 1-Scenario 1, and more protection than Alternative 1-Scenario 2, due to wider RMZs on fish-bearing streams, additional RMZs on Type N streams, and sensitive site buffers.	Alternative 4 would provide more protection of unique amphibian habitats than Alternative 1-Scenario 1, and substantially more protection than Alternative 1-Scenario 2, due to wider RMZs on all streams and the protection of Beaver Habitat Zones and Channel Disturbance Zones.
<b>Effects on Birds, Mammals, and Other Wildlife</b>	Alternative 1-Scenario 1 would be more likely than Alternative 1-Scenario 2 to provide habitat for birds, mammals, and other wildlife due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, and the protection of Channel Migration Zones.	Alternative 1-Scenario 2 would be less likely than Alternative 1-Scenario 1 to provide habitat for birds, mammals, and other wildlife due to narrower RMZs on fish-bearing streams and a lack of RMZs on non-fish-bearing streams.	Similar to Alternative 1-Scenario 1, Alternative 2 would be more likely than Alternative 1-Scenario 2 to provide habitat for birds, mammals, and other wildlife due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, and the protection of Channel Migration Zones.	Similar to Alternative 1-Scenario 1, Alternative 3 would be more likely than Alternative 1-Scenario 2 to provide habitat for birds, mammals, and other wildlife due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, and the protection of Channel Migration Zones.	Alternative 4 would provide more habitat for birds, mammals, and other wildlife than Alternative 1-Scenario 1, and substantially more than Alternative 1-Scenario 2, due to wider RMZs on all streams and the protection of Beaver Habitat Zones and Channel Disturbance Zones.



# Summary

**Table S-1.** Summary and Comparison of the Environmental Effects of the Alternatives (continued).

Criteria	No Action Alternative 1-Scenario 1	No Action Alternative 1-Scenario 2	Alternative 2	Alternative 3	Alternative 4
<b>Recreation</b>					
<b>Recreation in RMZ Areas</b>	Compared to Alternative 1-Scenario 2, Alternative 1-Scenario 1 would result in more opportunities for recreation in RMZs due to a reduction in future timber harvest levels that would likely maintain or increase the quality of recreational experiences in riparian areas (estimated 1,696,000 acres in RMZs on affected lands).	Alternative 1-Scenario 2 would result in less opportunities for recreation in RMZs than Alternative 1-Scenario 1 due to fewer riparian acres that would be maintained in RMZs (estimated 827,000 acres in RMZs on affected lands) that would likely decrease the quality of recreational experiences in these areas.	Alternative 2 would provide similar opportunities for recreation as Alternative 1-Scenario 1, and more opportunities than Alternative 1-Scenario 2, due to a reduction in future timber harvest levels that would likely maintain or increase the quality of recreational experiences in riparian areas (estimated 1,696,000 acres in RMZs on affected lands).	Alternative 3 would provide similar opportunities for recreation as Alternative 1-Scenario 1, and more opportunities than Alternative 1-Scenario 2, due to a reduction in future timber harvest levels that would likely maintain or increase the quality of recreational experiences in riparian areas (estimated 1,696,000 acres in RMZs on affected lands).	Alternative 4 would likely maintain or increase opportunities for recreation in riparian areas compared with either Alternative 1-Scenario 1 or 2 due to the amount of riparian acres maintained in RMZs. Alternative 4 would have an estimated 3,553,000 acres in RMZs on affected lands.
<b>Effects of Land Conversion on Recreation</b>	Alternative 1-Scenario 1 would likely result in more conversions of forestland than Alternative 1-Scenario 2 due to more restrictions on timber harvest and no regulatory certainty. Therefore, Alternative 1-Scenario 1 would also have a higher potential for recreational impacts from conversions than Alternative 1-Scenario 2.	Alternative 1-Scenario 2 would likely result in a less conversions of forestland than Alternative 1-Scenario 1 due to fewer restrictions on timber harvest. Therefore, Alternative 1-Scenario 2 would likely result in less recreational impacts from conversions than Alternative 1-Scenario 1.	Alternative 2 would result in slightly more conversions of forestland than Alternative 1-Scenario 2 due to more restrictions on timber harvest. Alternative 2 would result in less conversions than Alternative 1-Scenario 1 due to regulatory certainty. Therefore, Alternative 2 would have slightly more of an impact on recreation than Alternative 1-Scenario 2 and less of an impact than Alternative 1-Scenario 1.	Alternative 3 would result in slightly more conversions of forestland than Alternative 1-Scenario 2 due to more restrictions on timber harvest. Alternative 2 would result in less conversions than Alternative 1-Scenario 1 due to regulatory certainty. Therefore, Alternative 3 would have slightly more of an impact on recreation than Alternative 1-Scenario 2 and less of an impact than Alternative 1-Scenario 1.	Alternative 4 would likely result in more conversions of forestland than either Alternative 1-Scenario 1 or 2 due to more restrictions on timber harvest. Therefore, Alternative 4 would likely result in more recreational impacts from conversions than either Alternative 1-Scenario 1 or 2.
<b>Effects of Fish Population on Recreation</b>	Alternative 1-Scenario 1 would provide more protection of fish habitat than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, and the protection of Channel Migration Zones. Therefore, recreational fishing opportunities would improve under Alternative 1-Scenario 1 compared with Alternative 1-Scenario 2.	Alternative 1-Scenario 2 would provide less protection of fish habitat than Alternative 1-Scenario 1 due to narrower RMZs on fish-bearing streams, a lack of RMZs on non-fish-bearing streams, and limited protection of Channel Migration Zones. Therefore, recreational fishing opportunities would decline under Alternative 1-Scenario 2 compared with Alternative 1-Scenario 1.	Similar to Alternative 1-Scenario 1, Alternative 2 would provide more protection of fish habitat than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, and the protection of Channel Migration Zones. Therefore, recreational fishing opportunities under Alternative 2 would be similar to Alternative 1-Scenario 1 and would improve compared with Alternative 1-Scenario 2.	Similar to Alternative 1-Scenario 1, Alternative 3 would provide more protection of fish habitat than Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, and the protection of Channel Migration Zones. Therefore, recreational fishing opportunities under Alternative 3 would be similar to Alternative 1-Scenario 1 and would improve compared with Alternative 1-Scenario 2.	Alternative 4 would provide more protection of fish habitat than either Alternative 1-Scenario 1 or 2 due to wider RMZs on all streams and the protection of Channel Migration Zones, Beaver Habitat Zones, and Channel Disturbance Zones. Therefore, recreational fishing opportunities would improve under Alternative 4 compared with either Alternative 1-Scenario 1 or 2.
<b>Visual Resources</b>					
<b>Effects of Harvest in RMZs on Visual Resources</b>	Alternative 1-Scenario 1 would improve visual resources in riparian areas compared with Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, and the protection of Channel Migration Zones.	Alternative 1-Scenario 2 would degrade visual resources in riparian areas compared with Alternative 1-Scenario 1 due to narrower RMZs on fish-bearing streams, a lack of RMZs on non-fish-bearing streams, and limited protection of Channel Migration Zones.	As with Alternative 1-Scenario 1, Alternative 2 would improve visual resources in riparian areas compared with Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, and the protection of Channel Migration Zones.	As with Alternative 1-Scenario 1, Alternative 3 would improve visual resources in riparian areas compared with Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, and the protection of Channel Migration Zones.	Alternative 4 would improve visual resources in riparian areas compared with either Alternative 1-Scenario 1 or 2 due to wider RMZs on all streams and the protection of Channel Migration Zones, Beaver Habitat Zones, and Channel Disturbance Zones.
<b>Effects of Land Conversion on Visual Resources</b>	Alternative 1-Scenario 1 would likely result in a higher potential for visual resource impacts from conversions of forestland than Alternative 1-Scenario 2 due to a greater potential for conversions under Alternative 1-Scenario 1 compared with Alternative 1-Scenario 2.	Alternative 1-Scenario 2 would likely result in a lower potential for visual resource impacts from conversions of forestland than Alternative 1-Scenario 1 due to a lower potential for conversions under Alternative 1-Scenario 2 compared with Alternative 1-Scenario 1.	Alternative 2 would likely result in a lower potential for visual resource impacts from conversions of forestland than Alternative 1-Scenario 1 due to a lower potential for conversions. Alternative 2 would likely result in a greater potential for visual resource impacts from conversions than Alternative 1-Scenario 2 due to a greater potential for conversions.	Alternative 3 would likely result in a lower potential for visual resource impacts from conversions of forestland than Alternative 1-Scenario 1 due to a lower potential for conversions. Alternative 3 would likely result in a greater potential for visual resource impacts from conversions than Alternative 1-Scenario 2 due to a greater potential for conversions.	Alternative 4 would likely result in a higher potential for visual resource impacts from conversions of forestland than either Alternative 1-Scenario 1 or 2 due to a greater potential for conversions.





**Table S-1.** Summary and Comparison of the Environmental Effects of the Alternatives (continued).

Criteria	No Action Alternative 1-Scenario 1	No Action Alternative 1-Scenario 2	Alternative 2	Alternative 3	Alternative 4
<b>Cultural Resources</b>					
<b>Protection of Cultural Resources</b>	Alternative 1-Scenario 1 would have moderate incidental protection of undiscovered cultural resources compared to Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, the protection of Channel Migration Zones, and a required cultural resources module for Watershed Analysis.	Alternative 1-Scenario 2 would have very low incidental protection of undiscovered cultural resources compared to Alternative 1-Scenario 1 due to narrower RMZs on fish-bearing streams, a lack of RMZs on non-fish-bearing streams, limited protection of Channel Migration Zones, and no required cultural resources module for Watershed Analysis.	Similar to Alternative 1-Scenario 1, Alternative 2 would have moderate incidental protection of undiscovered cultural resources compared to Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, the protection of Channel Migration Zones, and a required cultural resources module for Watershed Analysis.	Similar to Alternative 1-Scenario 1, Alternative 3 would have moderate incidental protection of undiscovered cultural resources compared to Alternative 1-Scenario 2 due to wider RMZs on fish-bearing streams, additional RMZs on non-fish-bearing streams, the protection of Channel Migration Zones, and a required cultural resources module for Watershed Analysis.	Alternative 4 would provide higher incidental protection of undiscovered cultural resources than either Alternative 1-Scenario 1 or 2 due to wider RMZs on all streams and the protection of Channel Migration Zones, Beaver Habitat Zones, and Channel Disturbance Zones. As with Alternative 1-Scenario 1, a cultural resources module for Watershed Analysis would be required.
<b>Social and Economic Environment</b>					
<b>Lumber and Wood Products Employment</b>	Alternative 1-Scenario 1 would likely result in lower timber harvest levels than Alternative 1-Scenario 2, due to wider RMZs, resulting in an estimated loss of 3,000 direct jobs and \$121 million in lost income.	Alternative 1-Scenario 2 would likely result in higher timber harvest levels than Alternative 1-Scenario 1, due to narrower RMZs. Therefore, the potential for lost jobs and income would be lower than under Alternative 1-Scenario 1.	Similar to Alternative 1-Scenario 1, Alternative 2 would likely result in lower timber harvest levels than Alternative 1-Scenario 2, due to wider RMZs, resulting in an estimated loss of 3,000 direct jobs and \$121 million in lost income.	Similar to Alternative 1-Scenario 1, Alternative 3 would likely result in lower timber harvest levels than Alternative 1-Scenario 2, due to wider RMZs, resulting in an estimated loss of 3,000 direct jobs and \$121 million in lost income.	Timber harvest levels would be substantially lower under Alternative 4 compared to either Alternative 1-Scenario 1 or 2, due to wider RMZs, resulting in an estimated loss of 15,000 jobs and \$476 million in lost income.
<b>Recreational and Commercial Fishing Employment</b>	Alternative 1-Scenario 1 would result in greater recreational and commercial fishing opportunities than Alternative 1-Scenario 2 due to increased fish habitat protection.	Alternative 1-Scenario 2 would result in fewer recreational and commercial fishing opportunities than Alternative 1-Scenario 1 due to less protection of fish habitat.	Similar to Alternative 1-Scenario 1, Alternative 2 would result in greater recreational and commercial fishing opportunities than Alternative 1-Scenario 2 due to increased fish habitat protection.	Similar to Alternative 1-Scenario 1, Alternative 3 would result in greater recreational and commercial fishing opportunities than Alternative 1-Scenario 2 due to increased fish habitat protection.	Compared with either Alternative 1-Scenario 1 or 2, Alternative 4 would result in greater recreational and commercial fishing opportunities due to increased fish habitat protection.
<b>Natural Amenities (forested landscapes, availability of salmonids) and Quality of Life</b>	Alternative 1-Scenario 1 would result in more forested landscapes, higher salmonid populations, and a relative increase in natural amenities than Alternative 1-Scenario 2 due to more restrictions on timber harvest and thus, more protection of these amenities.	Alternative 1-Scenario 2 would result in less forested landscapes, lower salmonid populations, and a relative decrease in natural amenities than Alternative 1-Scenario 2 due to fewer restrictions on timber harvest and thus, less protection of these amenities.	As with Alternative 1-Scenario 1, Alternative 2 would result in more forested landscapes, higher salmonid populations, and a relative increase in natural amenities than Alternative 1-Scenario 2 due to more restrictions on timber harvest and thus, more protection of these amenities.	As with Alternative 1-Scenario 1, Alternative 3 would result in more forested landscapes, higher salmonid populations, and a relative increase in natural amenities than Alternative 1-Scenario 2 due to more restrictions on timber harvest and thus, more protection of these amenities.	Alternative 4 would be result in more forested landscapes, higher salmonid populations, and a relative increase in natural amenities than either Alternative 1-Scenario 1 or 2 due to more restrictions on timber harvest and thus, more protection of these amenities.
<b>Non-Use<sup>2/</sup> and Ecosystem Values<sup>3/</sup></b>	Alternative 1-Scenario 1 would result in lower timber harvest levels than Alternative 1-Scenario 2; therefore, non-use and ecosystem values would be higher under this Alternative than under Alternative 1-Scenario 2.	Alternative 1-Scenario 2 would result in higher timber harvest levels than Alternative 1-Scenario 2; therefore, non-use and ecosystem values would be lower under this Alternative than under Alternative 1-Scenario 1.	Similar to Alternative 1-Scenario 1, timber harvest levels under Alternative 2 would be lower than Alternative 1-Scenario 2; therefore, non-use and ecosystem values would be higher under this Alternative than under Alternative 1-Scenario 2.	Similar to Alternative 1-Scenario 1, timber harvest levels under Alternative 3 would be lower than Alternative 1-Scenario 2; therefore, non-use and ecosystem values would be higher under this Alternative than under Alternative 1-Scenario 2.	Timber harvest levels under Alternative 4 would be somewhat lower than Alternative 1-Scenario 1 and substantially lower than Alternative 1-Scenario 2; therefore, non-use and ecosystem values would be higher under this Alternative than either Alternative 1-Scenario 1 or 2.
<b>Environmental Justice<sup>4/</sup></b>	Alternative 1-Scenario 1 would result in greater availability of salmonids for tribal commercial, subsistence, and ceremonial use than Alternative 1-Scenario 2 due to increased protection of fish habitat.	Alternative 1-Scenario 2 would result in less availability of salmonids for tribal, commercial, subsistence, and ceremonial use than Alternative 1-Scenario 1 due to less protection of fish habitat.	Under Alternative 2, the availability of salmonids for tribal, commercial, subsistence, and ceremonial use would be similar to Alternative 1-Scenario 1, and would be greater than Alternative 1-Scenario 2 due to increased protection of fish habitat.	Under Alternative 3, the availability of salmonids for tribal, commercial, subsistence, and ceremonial use would be similar to Alternative 1-Scenario 1, and would be greater than Alternative 1-Scenario 2 due to increased protection of fish habitat.	Alternative 4 would result in greater availability of salmonids for tribal, commercial, subsistence, and ceremonial use than either Alternative 1-Scenario 1 or 2 due to increased protection of fish habitat.
<b>Cumulative Effects</b>					
<b>Air Quality</b>	Alternative 1-Scenario 1 would have a slightly lower contribution to cumulative air quality problems than Alternative 1-Scenario 2 due to more restrictions on timber harvest.	Alternative 1-Scenario 2 would have a slightly higher contribution to cumulative air quality problems than Alternative 1-Scenario 1 due to fewer restrictions on timber harvest.	Similar to Alternative 1-Scenario 1, Alternative 2 would have a slightly lower contribution to cumulative air quality problems than Alternative 1-Scenario 2 due to more restrictions on timber harvest.	Similar to Alternative 1-Scenario 1, Alternative 2 would have a slightly lower contribution to cumulative air quality problems than Alternative 1-Scenario 2 due to more restrictions on timber harvest.	Alternative 4 would have a substantially lower contribution to cumulative air quality problems than either Alternative 1-Scenario 1 or 2 due to more restrictions on timber harvest.

<sup>2/</sup> Non-use values represent the value that individuals assign to a resource independent of their use of the resource, including the value that individuals obtain from knowing that a resource exists for future use, or for future generations to inherit.

<sup>3/</sup> Ecosystem values are benefits provided by healthy ecosystems (e.g., soil stabilization and erosion control, improved air quality, carbon sequestration, biological diversity, etc.).

<sup>4/</sup> Negative effects on salmonid populations have the potential to disproportionately affect American Indians.



# Summary

**Table S-1.** Summary and Comparison of the Environmental Effects of the Alternatives (continued).

Criteria	No Action Alternative 1-Scenario 1	No Action Alternative 1-Scenario 2	Alternative 2	Alternative 3	Alternative 4
<b>Land Ownership and Use</b>	Alternative 1-Scenario 1 would have a higher contribution to the cumulative effect of lands being converted to non-forest uses than Alternative 1-Scenario 2 due to more restrictions on timber harvest and no regulatory certainty.	Alternative 1-Scenario 2 would have a lower contribution to the cumulative effect of lands being converted to non-forest uses than Alternative 1-Scenario 1 due to fewer restrictions on timber harvest.	Alternative 2 would have a lower contribution to the cumulative effect of lands being converted to non-forest uses than Alternative 1-Scenario 1 due to regulatory certainty. Alternative 2 would have a slightly higher contribution to the cumulative effect of lands being converted to non-forest uses than Alternative 1-Scenario 2 due to more restrictions on timber harvest.	Alternative 3 would have a lower contribution to the cumulative effect of lands being converted to non-forest uses than Alternative 1-Scenario 1 due to regulatory certainty. Alternative 3 would have a slightly higher contribution to the cumulative effect of lands being converted to non-forest uses than Alternative 1-Scenario 2 due to more restrictions on timber harvest.	Alternative 4 would have a higher contribution to the cumulative effect of lands being converted to non-forest uses than either Alternative 1-Scenario 1 or 2 due to more restrictions on timber harvest.
<b>Aquatic Resources</b>	Alternative 1-Scenario 1 would have less contribution to the cumulative effects on water quality and peak flows compared to Alternative 1-Scenario 2 due to more restrictions on timber harvest.	Alternative 1-Scenario 2 would have a greater contribution to the cumulative effects on water quality and peak flows compared to Alternative 1-Scenario 1 due to fewer restrictions on timber harvest.	Similar to Alternative 1-Scenario 1, Alternative 2 would have less contribution to the cumulative effects on water quality and peak flows compared to Alternative 1-Scenario 2 due to more restrictions on timber harvest.	Similar to Alternative 1-Scenario 1, Alternative 3 would have less contribution to the cumulative effects on water quality and peak flows compared to Alternative 1-Scenario 2 due to more restrictions on timber harvest.	Alternative 4 would have less contribution to the cumulative effects on water quality and peak flows compared to either Alternative 1-Scenarios 1 or 2 due to more restrictions on timber harvest. However, the low contribution could diminish over time due to a higher conversion rate of forestlands than either Alternative 1-Scenario 1 or 2.
<b>Fish and Fish Habitat</b>	Alternative 1-Scenario 1 would contribute more to the long-term recovery and conservation of listed species when added to other actions than Alternative 1-Scenario 2 due to more restrictions on timber harvest.	Alternative 1-Scenario 2 would contribute less to the long-term recovery and conservation of listed species when added to other actions than Alternative 1-Scenario 1 due to fewer restrictions on timber harvest.	Alternative 2 would contribute more to the long-term recovery and conservation of listed species when added to other actions than either Alternative 1-Scenarios 1 or 2 due to regulatory certainty.	Alternative 3 would contribute more to the long-term recovery and conservation of listed species when added to other actions than either Alternative 1-Scenarios 1 or 2 due to regulatory certainty.	Alternative 4 would contribute more to the long-term recovery and conservation of listed species than either Alternative 1-Scenario 1 or 2 due to more restrictions on timber harvest. However, this contribution could diminish over time due to a higher conversion rate of forestlands than either Alternative 1-Scenario 1 or 2.
<b>Cumulative Watershed Effects</b>	The potential for cumulative watershed effects would be less likely under Alternative 1-Scenario 1 than under Alternative 1-Scenario 2 due to more restrictions on timber harvest.	The potential for cumulative watershed effects would be more likely under Alternative 1-Scenario 2 than under Alternative 1-Scenario 1 due to fewer restrictions on timber harvest.	Alternative 2 would have a lower potential for cumulative watershed effects than Alternative 1-Scenario 1 due to regulatory certainty, and a substantially lower potential than Alternative 1-Scenario 2 due to more restrictions on timber harvest.	Alternative 3 would have a lower potential for cumulative watershed effects than Alternative 1-Scenario 1 due to regulatory certainty, and a substantially lower potential than Alternative 1-Scenario 2 due to more restrictions on timber harvest.	Alternative 4 would have a reduced potential for cumulative watershed effects than either Alternative 1-Scenario 1 or 2 due to more restrictions on timber harvest. However, this could diminish over time due to a higher conversion rate of forestlands to non-forest uses.
<b>Vegetation and Wildlife</b>	Alternative 1-Scenario 1 would have a greater cumulative contribution to the protection of vegetation and thus, wildlife habitat, compared with Alternative 1-Scenario 2 due to more restrictions on timber harvest.	Alternative 1-Scenario 2 would have a lower cumulative contribution to the protection of vegetation and thus, wildlife habitat, compared with Alternative 1-Scenario 1 due to fewer restrictions on timber harvest.	Similar to Alternative 1-Scenario 1, Alternative 2 would have a greater cumulative contribution to the protection of vegetation and thus, wildlife habitat, compared with Alternative 1-Scenario 2 due to more restrictions on timber harvest.	Similar to Alternative 1-Scenario 1, Alternative 3 would have a greater cumulative contribution to the protection of vegetation and thus, wildlife habitat, compared with Alternative 1-Scenario 2 due to more restrictions on timber harvest.	Alternative 4 would have a greater cumulative contribution to the protection of vegetation and thus, wildlife habitat, compared with either Alternative 1-Scenario 1 or 2. However, this could diminish over time due to a higher conversion rate of forestlands to non-forest uses.
<b>Economic and Social</b>	Alternative 1-Scenario 1 would slightly increase the downward trend in the forest products market as compared to Alternative 1-Scenario 2 due to more restrictions on timber harvest. Alternative 1-Scenario 1 would result in improvements in fish habitat over time having a greater cumulative contribution to recreation and commercial fishing compared with Alternative 1-Scenario 2.	Alternative 1-Scenario 2 would have little effect on the downward trend in the forest products market as compared to Alternative 1-Scenario 1 due to fewer restrictions on timber harvest. Alternative 1-Scenario 2 would result in few improvements in fish habitat over time having little cumulative contribution to recreation and commercial fishing compared with Alternative 1-Scenario 1.	Alternative 2 would have a similar effect on the downward trend in the forest products market as Alternative 1-Scenario 1 and a greater effect than Alternative 1-Scenario 2. As with Alternative 1-Scenario 1, Alternative 2 would result in similar improvements in fish habitat over time having a greater cumulative contribution to recreation and commercial fishing compared with Alternative 1-Scenario 2.	Alternative 3 would have a similar effect on the downward trend in the forest products market as Alternative 1-Scenario 1 and a greater effect than Alternative 1-Scenario 2. As with Alternative 1-Scenario 1, Alternative 3 would result in similar improvements in fish habitat over time having a greater cumulative contribution to recreation and commercial fishing compared with Alternative 1-Scenario 2.	Alternative 4 would have a substantially higher effect on the downward trend in the forest products market than either Alternative 1-Scenarios 1 or 2 due to more restrictions on timber harvest and a higher conversion rate of forestlands to non-forest uses. Alternative 4 would result in improvements in fish habitat over time having a greater cumulative contribution to recreation and commercial fishing compared with either Alternative 1-Scenario 1 or 2. However, this could diminish over time due to a higher conversion rate of forestlands to non-forest uses.