

**FINAL
SUPPLEMENTAL ENVIRONMENTAL
IMPACT STATEMENT**

**FOR A
REQUEST BY PLUM CREEK TIMBER COMPANY
FOR APPROVAL OF
MODIFICATIONS TO ITS
CENTRAL CASCADES HABITAT CONSERVATION PLAN**



**U.S. Department of the Interior
Fish and Wildlife Service**



**U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service**

May, 1999

COVER SHEET

Title of Proposed Action: Modification of the Plum Creek Timber Company Central Cascades Habitat Conservation Plan, Contingent on the Proposed Exchange of Lands between Plum Creek Timber Company and the U.S. Forest Service

Responsible Officials: Mr. Thomas J. Dwyer
Deputy Regional Director
U.S. Fish & Wildlife Service
911 NE 11th Avenue
Portland, OR 97232

Mr. William Stelle, Jr.
Regional Director
National Marine Fisheries Service
7600 Sand Point Way NE
Seattle, WA 98115

Contact: Mr. William O. Vogel
Pacific Northwest Habitat
Conservation Plan Program
U.S. Fish & Wildlife Service
510 Desmond Dr., SE, #102
Lacey, WA 98502
(360)753-9440

Mr. Dennis J. Carlson
Habitat Branch
National Marine Fisheries Service
510 Desmond Dr., SE, #103
Lacey, WA 98502
(360)753-6054

Location of Proposed Action: Plum Creek Timber Company lands located in King and Kittitas Counties, Washington;
U.S. Forest Service lands also located in King and Kittitas Counties, Washington.

Abstract: This Final Supplemental Environmental Impact Statement (FSEIS) has been prepared in partial fulfillment of National Environmental Policy Act (NEPA) requirements relating to the proposed Federal action of approving modifications to the Plum Creek Timber Company (Plum Creek) Central Cascades Habitat Conservation Plan (HCP). The HCP applies to lands in King and Kittitas counties, Washington. Plum Creek has proposed this modification to the U.S. Fish and Wildlife Service and the National Marine Fisheries Service in connection with its desire to exchange some of the lands covered by the HCP with the U.S. Forest Service. The FSEIS compares the environmental effects associated with the proposal and one additional alternative, against the environmental effects associated with the status quo (No Action).

Comments: This FSEIS will be available for review until June 21, 1999. Questions concerning this proposed action and the environmental review should be directed to the U.S. Fish and Wildlife Service or National Marine Fisheries Service at the addresses provided above.

TABLE OF CONTENTS

CONTEXT	1
HISTORY OF THE PROJECT.....	1
STATUS OF THE PROJECT.....	2
RELATIONSHIP TO OTHER DOCUMENTS AND NECESSARY DECISIONS.....	2
DESCRIPTION OF FSEIS FORMAT.....	2
FIGURE 1 PLUM CREEK'S HABITAT CONSERVATION PLAN AREA LAND OWNERSHIPS POST LAND EXCHANGE	1-1
CHAPTER 1 INTRODUCTION	1-3
1.1 INTRODUCTION.....	1-3
1.2 PURPOSE AND NEED.....	1-6
1.2.1 SERVICES' PURPOSE.....	1-6
1.2.2 SERVICES' NEED.....	1-6
1.2.3 APPLICANT'S PURPOSE.....	1-7
1.2.4 APPLICANT'S NEED.....	1-7
1.3 ENVIRONMENTAL REVIEW PROCESS.....	1-7
1.4 RELATIONSHIP TO OTHER PLANS, REGULATIONS, AND LAWS.....	1-7
1.4.1 THE INTERSTATE-90 LAND EXCHANGE.....	1-8
1.4.2 THE NORTHWEST FOREST PLAN AND RELATED PLANS OR PROJECTS.....	1-8
1.4.3 OTHER HABITAT CONSERVATION PLANS.....	1-9
1.4.4 OTHER PRIVATE OWNER ACTIONS.....	1-9
1.5 HCP MODIFICATION CRITERIA.....	1-10
1.6 SCOPING PROCESS.....	1-11
1.7 ISSUES AND CONCERNS.....	1-11
1.8 OVERVIEW OF THE REMAINING CHAPTERS.....	1-11
CHAPTER 2 ALTERNATIVES, INCLUDING THE PROPOSED ACTION	2-1
2.1 INTRODUCTION.....	2-1
2.2 ALTERNATIVES CONSIDERED AND ANALYZED.....	2-1
2.2.1 ALTERNATIVE 1 – NO ACTION.....	2-1
2.2.2 ALTERNATIVE 2 – PARTIAL HCP.....	2-2
2.2.3 ALTERNATIVE 3 – PROPOSED ACTION.....	2-3
2.2.4 COMPARATIVE ANALYSIS OF THE ALTERNATIVES.....	2-3
2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS.....	2-4
CHAPTER 3 AFFECTED ENVIRONMENT	3-1
3.1 INTRODUCTION.....	3-1
3.1.1 ENVIRONMENTAL SETTING.....	3-1
3.1.2 PLUM CREEK'S CASCADE TIMBERLANDS.....	3-2
3.2 LAND USE AND LAND OWNERSHIP.....	3-2

Table of Contents

3.3	LANDFORM AND GEOLOGY.....	3-3
3.4	AIR QUALITY.....	3-4
3.5	WATER QUALITY AND QUANTITY.....	3-4
3.5.1	MAJOR SUBBASINS.....	3-4
3.5.1.1	THE GREEN RIVER SUBBASIN.....	3-5
3.5.1.2	THE YAKIMA RIVER SUBBASIN.....	3-5
3.6	VEGETATION.....	3-6
3.7	WILDLIFE.....	3-6
3.7.1	WILDLIFE OVERVIEW.....	3-6
3.7.2	SECTION 10(A) SPECIES.....	3-7
3.7.2.1	NORTHERN SPOTTED OWL (<i>STRIX OCCIDENTALIS</i>) (HCP SECTION 2.10.1).....	3-7
3.7.2.2	MARBLED MURRELET (<i>BRACHYRAMPHUS MARMORATUS</i>) (HCP SECTION 2.10.2).....	3-8
3.7.2.3	GRIZZLY BEAR (<i>URSUS ARCTOS</i>) (HCP SECTION 2.10.3).....	3-9
3.7.2.4	GRAY WOLF (<i>CANIS LUPUS</i>) (HCP SECTION 2.10.4).....	3-10
3.7.3	SPECIAL EMPHASIS SPECIES (HCP SECTION 2.10.5).....	3-10
3.7.4	ASSOCIATED SPECIES (HCP SECTION 2.10.7).....	3-11
3.7.4.1	LIFEFORMS.....	3-11
3.8	FISH AND FISH HABITAT.....	3-12
3.9	SOCIO-ECONOMIC.....	3-13
3.10	CULTURAL RESOURCES.....	3-14
3.10.1	INTRODUCTION.....	3-14
3.10.2	DEFINITION.....	3-15
3.10.3	IMPORTANCE.....	3-16
3.10.4	DESCRIPTION OF CULTURAL RESOURCE CONCERNS.....	3-18
3.10.4.1	PREHISTORIC AND ETHNOGRAPHIC OVERVIEW.....	3-18
3.10.4.2	CULTURAL RESOURCES DESCRIPTION.....	3-22
3.10.4.3	TRADITIONAL PLACES.....	3-26
3.10.4.4	ARCHAEOLOGICAL RESOURCES.....	3-30
3.10.4.5	HISTORIC PROPERTIES.....	3-31
3.10.5	EXISTING PROTECTIVE MEASURES.....	3-34
3.10.5.1	FEDERAL LAWS.....	3-34
3.10.5.2	STATE LAWS.....	3-35
3.10.5.3	TRIBAL REGULATIONS AND PROGRAMS.....	3-36
3.10.6	PLUM CREEK VOLUNTARY ACTIONS.....	3-36
3.10.6.1	RELATIONSHIP OF PLUM CREEK AND YAKAMA INDIAN NATION.....	3-36
3.10.6.2	RELATIONSHIP OF PLUM CREEK AND MUCKLESHOOT INDIAN TRIBE.....	3-36
3.11	RECREATION.....	3-37
3.12	VISUAL RESOURCES.....	3-37
3.13	TRUST RESPONSIBILITY AND TREATY.....	3-38
CHAPTER 4	ENVIRONMENTAL CONSEQUENCES.....	4-1
4.1	INTRODUCTION.....	4-1
4.2	LAND USE AND LAND OWNERSHIP.....	4-1
4.2.1	ALTERNATIVE 1 (NO ACTION).....	4-1
4.2.2	ALTERNATIVE 2 (PARTIAL HCP).....	4-9
4.2.3	ALTERNATIVE 3 (PROPOSED ACTION).....	4-10
4.3	LANDFORM AND GEOLOGY.....	4-10
4.3.1	ALTERNATIVE 1 (NO ACTION).....	4-11
4.3.2	ALTERNATIVE 2 (PARTIAL HCP).....	4-12
4.3.3	ALTERNATIVE 3 (PROPOSED ACTION).....	4-13

4.4	AIR QUALITY	4-14
4.4.1	ALTERNATIVE 1 (NO ACTION), AND ALTERNATIVES 2 (PARTIAL HCP) AND 3 (PROPOSED ACTION)	4-14
4.5	WATER QUALITY AND QUANTITY	4-15
4.5.1	ALTERNATIVE 1 (NO ACTION)	4-15
4.5.2	ALTERNATIVE 2 (PARTIAL HCP)	4-16
4.5.3	ALTERNATIVE 3 (PROPOSED ACTION)	4-16
4.6	VEGETATION	4-16
4.6.1	ALTERNATIVE 1 (NO ACTION)	4-16
4.6.2	ALTERNATIVES 2 (PARTIAL HCP) AND 3 (PROPOSED ACTION)	4-17
4.7	WILDLIFE	4-20
4.7.1	SECTION 10(A) PERMIT SPECIES	4-21
4.7.1.1	NORTHERN SPOTTED OWL	4-21
4.7.1.1.1	BACKGROUND	4-21
4.7.1.1.2	DESCRIPTION OF HCP CONSERVATION MEASURES	4-22
4.7.1.2	MARBLED MURRELET	4-28
4.7.1.3	GRIZZLY BEAR	4-29
4.7.1.4	GRAY WOLF	4-31
4.7.2	SPECIAL EMPHASIS SPECIES	4-31
4.7.2.1	LARCH MOUNTAIN SALAMANDER	4-31
4.7.2.2	NORTHERN GOSHAWK	4-32
4.7.3	SPECIES OF CONCERN	4-33
4.7.3.1	BALD EAGLE	4-33
4.7.4	ASSOCIATED SPECIES	4-34
4.7.4.1	LIFEFORM 1 (SEE SECTION 4.8—FISH)	4-35
4.7.4.2	LIFEFORM 2	4-35
4.7.4.3	LIFEFORM 2	4-39
4.7.4.3	LIFEFORM 3	4-41
4.7.4.4	LIFEFORM 4	4-42
4.7.4.5	LIFEFORM 5	4-43
4.7.4.6	LIFEFORM 6	4-45
4.7.4.7	LIFEFORM 7	4-46
4.7.4.8	LIFEFORM 8	4-47
4.7.4.9	LIFEFORM 9	4-48
4.7.4.10	LIFEFORM 10	4-48
4.7.4.11	LIFEFORM 11	4-50
4.7.4.12	LIFEFORM 12	4-50
4.7.4.13	LIFEFORM 13	4-51
4.7.4.13.1	LIFEFORM 13A	4-51
4.7.4.13.2	LIFEFORM 13	4-51
4.7.4.14	LIFEFORM 14	4-53
4.7.4.14.1	LIFEFORM 14A	4-53
4.7.4.14.2	LIFEFORM 14	4-54
4.7.4.15	LIFEFORM 15	4-55
4.7.4.16	LIFEFORM 16	4-56
4.7.5	CONCLUSION	4-57
4.8	FISH AND FISH HABITAT	4-58
4.8.1	ALTERNATIVE 1 (NO ACTION)	4-58
4.8.2	ALTERNATIVE 2 (PARTIAL HCP)	4-60
4.8.3	ALTERNATIVE 3 (PROPOSED ACTION)	4-60
4.9	ECONOMIC AND SOCIAL ENVIRONMENT	4-60
4.9.1	ALTERNATIVE 1 (NO ACTION)	4-60
4.9.2	ALTERNATIVE 2 (PARTIAL HCP) AND ALTERNATIVE 3 (PROPOSED ACTION)	4-61
4.10	CULTURAL RESOURCES	4-61
4.10.1	POTENTIAL EFFECTS OF FORESTRY MANAGEMENT	4-61
4.10.2	EXISTING CONSERVATION MEASURES IN THE PLANNING AREA	4-63
4.10.3	COMPARISON OF ALTERNATIVES	4-64

Table of Contents

4.11 RECREATION	4-67
4.11.1 ALTERNATIVE 1 (NO ACTION).....	4-68
4.11.2 ALTERNATIVE 2 (PARTIAL HCP) AND ALTERNATIVE 3 (PROPOSED ACTION).....	4-68
4.12 VISUAL RESOURCES.....	4-68
4.13 TRUST RESPONSIBILITY AND TREATY RIGHTS.....	4-69
4.14 CUMULATIVE EFFECTS.....	4-70
4.15 CONCLUSION.....	4-73
LIST OF PREPARERS.....	5-1
DSEIS DISTRIBUTION LIST.....	5-2
FSEIS DISTRIBUTION LIST.....	5-6
ABBREVIATIONS, ACRONYMS, AND DEFINITIONS.....	5-10
ABBREVIATIONS AND ACRONYMS.....	5-10
DEFINITIONS.....	5-11
LITERATURE CITED.....	5-12
FSEIS INDEX.....	5-17

LIST OF TABLES

TABLE 1. PRE- AND POST- I-90 LAND EXCHANGE OWNERSHIP ACRES IN THE HCP PLANNING AREA.....	1-5
TABLE 2. COMPARISON BY ANALYTICAL CRITERIA BY ALTERNATIVE.....	4-2
TABLE 3. PERCENTAGE FOREST STAND TYPE PROJECTIONS IN ACRES FOR ALL OWNERSHIPS, BY ALTERNATIVE AND BY DECADE (DECADES CORRESPOND TO ISSUANCE OF PERMIT IN 1996).....	4-19
TABLE 4. SPOTTED OWL HABITAT IN THE PLANNING AREA ON ALL OWNERSHIPS BY DECADE, BY ALTERNATIVE (PERCENT).....	4-24
TABLE 5. SPOTTED OWL HABITAT ON PLUM CREEK LANDS BY DECADE, BY ALTERNATIVE.....	4-24
TABLE 6. ACRES OF MARBLED MURRELET POTENTIALLY SUITABLE HABITAT BY ALTERNATIVE.....	4-29
TABLE 7. ESTIMATED AREA FOR LIFEFORMS BY DECADE, BY ALTERNATIVE (PERCENT). REFER TO TABLE 17 IN DEIS.	4-36

CONTEXT

(This section is new and the redline/strikeout format is not used.)

HISTORY OF THE PROJECT

Some of the earliest discussions regarding this project within the Fish and Wildlife Service (Service) were regarding the land exchange/HCP. The Fish and Wildlife Service, the National Marine Fisheries Service (NMFS) (together known as the Services), and the Applicant (Plum Creek Timber Company, L.P.) began work on the Habitat Conservation Plan (HCP) in early 1994. Early in HCP development, the then-Applicant initiated peer review of a number of technical reports that described the Company's attempts at data accumulation, surveys, research, and assessments of situations such as limiting factors. Peer review comments were solicited from more than 50 scientists, including individuals from government agencies (State and Federal), Tribes, industry, universities, and private consulting firms. Service personnel reviewed and approved the lists of peer reviewers for each technical report, and reviewed each of these technical reports. The procedures for HCP review and for the preparation and review of an Environmental Impact Statement were combined. The possibilities of a land exchange were contemplated and discussed in the HCP.

In June of 1996, the Services completed the processing of the application package and on June 27, 1996, the Services issued an incidental take permit and signed an Implementation Agreement based upon the HCP. Following issuance of the permit, discussions regarding a land exchange continued between the U.S. Forest Service (Forest Service) and Plum Creek. On July 25, 1997, the Service wrote to a number of Native American Tribes regarding the proposed land exchange between Plum Creek and the Forest Service. In those letters, the Service stated that the proposed exchange may result in a significant change in the ownership of lands within your "Usual and Accustomed Areas" and that it may be desirable to initiate Government-to-Government meetings. On May 8, 1998, the Services also wrote similar letters to the Tribes and Washington Department of Fish and Wildlife. In April, 1998, the Forest Service released a DEIS regarding the proposed land exchange. During the comment period, the Services attended four public meetings in conjunction with the Forest Service as announced in the May 5, 1998, Federal Register (63 FR 24823). The comment period closed for the Forest Service DEIS on June 19, 1998. In October, 1998, the U.S. Congress passed House Resolution 4328, which legislated the land exchange.

On December 9, 1998, the Services published in the Federal Register (63 FR 67914) a Notice of Intent to prepare a supplemental environmental impact statement for the potential modification of the HCP. Subsequently, the Services prepared a Draft Supplemental Environmental Impact Statement which was designed to supplement the original EIS. The original DEIS was released in November, 1995, and the FEIS was released in April, 1996. Both of these documents were prepared with respect to the Federal actions of initial permit issuance and entering into an unlisted species agreement. With respect to the current Federal action of approving the HCP modification, the Services believed it was appropriate to meet their NEPA requirements by utilizing the supplemental EIS process. The DSEIS was released on December 18, 1998, (63 FR 70155) and the 52-day comment period closed on February 8, 1999. Immediately before and during the comment period, the Services conducted two meetings with the Muckleshoot Indian Tribe. During the comment period the Services also conducted two public meetings as announced in the January 5, 1999 Federal Register (64 FR 482). The Services received 12 comments.

STATUS OF THE PROJECT

The determination of the actual parcels to be exchanged will be made in the near future upon making adjustments for restrictions on historical/cultural resource properties and determining the fair market value from the appraisal. When legislated, the maximum size was 62,384 acres going to the Forest Service and 16,495 acres going to Plum Creek. It is anticipated some of the the Plum Creek parcels will drop out of the exchange. HR 4328, section 605 (c) (2), lists the sequence of 27 sections of Plum Creek lands that could be deleted, if necessary, to balance the exchange. For analysis purposes in this FSEIS, it was assumed that parcels 1 through 22 would be deleted in the exchange, but parcels 23 through 27 would remain.

RELATIONSHIP TO OTHER DOCUMENTS AND NECESSARY DECISIONS

This FSEIS is being written to amend and replace the DSEIS in response to public comment and incorporate additional information, corrections, and changes. There are two appendices to this document. Appendix A presents a list of commentors and the summary and response to public comment. Appendix B contains the revised HCP modification document. As mentioned earlier, technical reports referenced in the HCP Modification are not a part of those documents and are not a necessary part of the application package. They were made available during the comment period for convenience of the readers only. The original HCP, NEPA documents, and technical reports should also be available in major libraries in Western Washington.

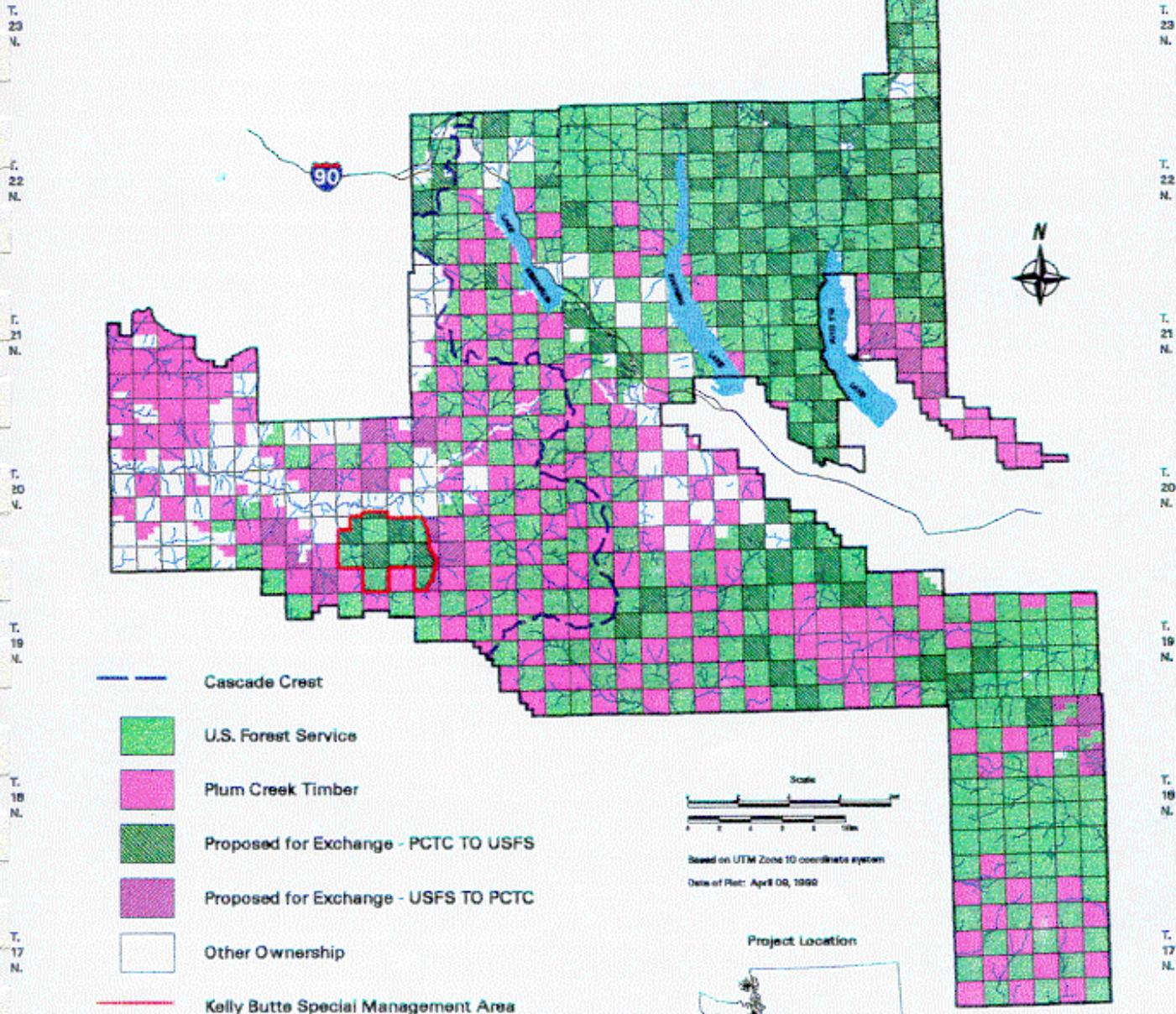
The Services will be fulfilling their obligations under section 7 of the ESA. Upon completion of the waiting period, the Services will re-initiate consultation under section 7. This is needed to ensure the section 10 Issuance Criteria are continuing to be met with regard to avoidance of jeopardy. The Services will complete the section 7 documents, a Set of Findings, and a Record of Decision prior to approving the HCP modification.

DESCRIPTION OF FSEIS FORMAT

This document is considered a stand-alone document from the standpoint that it does not rely on text from the DSEIS. All of the text from the DSEIS, which does not change is repeated herein. Text which does change is presented in ~~strikeout~~/underline format. Underlined words and characters are additions, and the words and characters which are lined through (~~strikeout~~) are deletions.

FIGURE 1

Plum Creek's Habitat Conservation Plan Area in the Central Cascades Mountain Range, and Land Ownerships - Post Land Exchange.



Chapter 1 INTRODUCTION

1.1 INTRODUCTION

Plum Creek Timber Company (Plum Creek) has requested approval from the U. S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) (together, the Services) to modify an existing Habitat Conservation Plan (HCP), which is the basis for an Incidental Take Permit (ITP) issued to Plum Creek by the Services. As authorized under Section 10 of the Endangered Species Act (ESA) an ITP may be issued to a nonfederal land owner for the take of endangered and threatened species, provided the issuance criteria in Section 10(a)(2)(B) are ~~not met, such as the take be incidental to otherwise lawful activities, will not appreciably reduce the likelihood of the survival and recovery of the species in the wild, and that adequate funding for the plan will be provided.~~ The Issuance Criteria for an incidental take permit are contained in the Endangered Species Act and again in its implementing regulations. The Fish and Wildlife Service's issuance criteria contained in 50 CFR 17.22(b)(2) and 17.32(b)(2) are: (1) The taking will be incidental; (2) The applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (3) The applicant will ensure that adequate funding for the conservation plan and procedures to deal with unforeseen circumstances will be provided; (4) The taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild; (5) Applicant will ensure that other measures FWS may require as necessary and appropriate will be provided; (6) The Services have received such other assurances as may be required that the HCP will be implemented.

The National Marine Fisheries Service's issuance criteria contained in 50 CFR 222.22(c)(2) are: (1) The taking will be incidental; (2) The applicant will, to the maximum extent practicable, monitor, minimize, and mitigate the impacts of such taking; (3) The taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; (4) The applicant has amended the conservation plan to include any measures (not originally proposed by the applicant) that the Assistant Administrator determines are necessary or appropriate; and (5) There are adequate assurances that the conservation plan will be funded and implemented, including any measures required by the Assistant Administrator.

As a condition of receiving an ITP, a landowner must prepare and submit to the Services for approval an HCP containing the mandatory elements of Section 10(a)(2)(A). ~~including a strategy for minimizing and mitigating all take associated with the proposed activities the impact of the taking to the maximum extent practicable.~~ An HCP must specify: (1) The impact that will likely result from the taking; (2) What steps the applicant will take to monitor, minimize and mitigate such impacts, the funding available to implement such steps, and the procedures to be used to deal with unforeseen circumstances; (3) What alternative actions to such taking the applicant considered, and the reasons why such alternatives are not proposed to be used; and (4) Such other measures that the Director may require as being necessary or appropriate for the purposes of the plan.

NMFS mandatory elements state that a conservation plan should specify: (1) The anticipated impact (i.e., amount, extent, and type of anticipated taking) of the proposed activity on the species or stocks; (2) The anticipated impact of the proposed activity on the habitat of the species or stocks and the likelihood of restoration of the affected habitat; (3) The steps (specialized equipment, methods of conducting activities, or other means) that will be taken to monitor, minimize, and mitigate such impacts and the funding available to implement such measures; and (4) The alternative actions to such taking that were considered

and the reasons why those alternatives are not being used. Also, the regulations enumerate (5) A list of all sources of data used in preparation of the plan, including reference reports, environmental assessments and impact statements, and personal communications with recognized experts on the species or activity who may have access to data not published in current literature.

An application for an incidental take permit normally includes: (1) Signed and Dated Application Form (3-200); (2) Application Fee; (3) Habitat Conservation Plan; (4) Draft NEPA Document (EA or EIS); (5) Implementation Agreement.

Plum Creek's existing HCP was approved and an ITP was originally issued in June 1996. The HCP and ITP apply to activities for the management of commercial timberland within a 170,600-acre Project Area intermingled within a 418,700-acre Planning Area that includes Federal lands. The Planning Area is located within east King County and west Kittitas County, Washington. Figure 1 (page 1-1) illustrates the land ownership pattern that would exist within the Planning Area. Most of the Planning Area is within the Mt. Baker-Snoqualmie and Wenatchee National Forests' outer boundary. It is bounded on the north by the Alpine Lakes Wilderness and on the south by the Norse Peak Wilderness. The Cedar River Municipal Watershed (City of Seattle) is located northwest of the Planning Area with only a small portion lying within the Planning Area. The Green River Municipal Watershed (City of Tacoma) is located adjacent to, and south of the Cedar River Watershed. The Green River Watershed covers a large portion of the Planning Area. ~~Both municipal watersheds are closed to the public.~~ Although the City of Tacoma, through agreements with the Forest Service and private landowners, maintains locked gates to restrict public access to portions of the Green River Municipal watershed, it is neither "closed" to the public, nor is public access restricted in the HCP Planning Area. The Planning Area is not contiguous to any tribal reservations or National Parks, nor does it include any incorporated cities. However, ~~these~~ lands within the Planning Area are important to several Native American Tribes.

The HCP contemplated that Plum Creek lands managed under the HCP and ITP would likely change as a result of future land exchanges with the United States. Both, the HCP and its associated Implementation Agreement (IA) provide procedures and criteria for modification of the HCP to accommodate such exchanges.

The HCP describes two scenarios for land exchanges with the United States whereby "the biological integrity of the HCP would be either maintained or improved" (Section 5.3.4.2; HCP). "Scenario One" exchanges Plum Creek-owned lands in the Planning Area for government-owned lands outside of the Planning Area. "Scenario Two" describes an exchange of Federal and Plum Creek lands so that within the HCP Planning Area there is: (1) an increase in Forest Service lands managed as Late-Successional Reserves (LSR) or Adaptive Management Areas (AMA) under the Northwest Forest Plan; (2) reduced Federal ownership of lands managed as Matrix under the Forest Plan; and, (3) there is a net decrease in harvestable area. The IA explicitly provides that the Services will approve modification of the HCP to accommodate such a land exchange provided that it does not compromise the effectiveness of the HCP or result in a level of incidental take of Permit Species beyond that analyzed and authorized in the original HCP and ITP.

Consistent with the procedures and criteria set forth in the HCP and IA, Plum Creek has submitted a request to modify the HCP to accommodate the potential land exchange. Plum Creek's request is accompanied by a modification to the HCP, which describes ~~in detail~~ the modifications in detail and

analyzes the effects of those proposed modifications. ~~The HCP modification document is based, in part, on the DEIS for the proposed land exchange (I-90 Land Exchange DEIS 1998), which is incorporated herein by reference.~~

The I-90 Land Exchange was legislated by Congress in H.R. 4328 in October 1998. ~~The exact configuration and total acreage of lands that will ultimately be exchanged between Plum Creek and the Forest Service will closely approximate the exchange discussed in this supplemental EIS. Minor acreage adjustments are expected based on negotiations between Plum Creek and the Forest Service and the final outcome of the land appraisals. The potential land exchange would result in a transfer to the Forest Service of up to 53,400 acres of the 170,600 acres managed by Plum Creek within the Planning Area and previously covered by Plum Creek's ITP and Plum Creek HCP, and the transfer of up to 17,000 acres of Forest Service lands to Plum Creek, 10,800 acres of which are in the Planning Area and would be managed under the HCP and ITP. A preliminary final appraisal has been released which is incorporated into the ownership assumptions for the HCP Modification document. The appraisal indicates the land exchange will be comprised of 49,158 acres of Plum Creek land and 15,832 acres of National Forest System lands. Plum Creek's 49,158 acres and a donation by Plum Creek to the United States of 844 acres are in the HCP Planning Area for a total of approximately 50,000 acres going to the Forest Service that would no longer be included in the HCP and ITP. Primarily to resolve some cultural resource issues, the acres from the Forest Service to Plum Creek were reduced to 15,832 prior to the appraisal. After deducting the 5,601 acres in the Gifford-Pinchot National Forest, approximately 10,200 acres in the HCP Planning Area would be transferred to Plum Creek and managed under the HCP and ITP. If the proposed modification is approved and the land exchange is concluded, Plum Creek land managed under the HCP will total approximately 131,200 ~~128,000~~ (Table 1). Any changes between ~~in~~ the HCP modification and the final land exchange configuration will be reflected in the impacts analysis of the Record of Decision ~~Final Supplemental Environmental Impact Statement~~ prepared by the Services.~~

Ownership	Pre-Land Exchange	Post-Land Exchange
Plum Creek	170,600	<u>131,200</u> 128,000
Forest Service	<u>196,200</u> 195,900	<u>235,600</u> 238,500
Other (State and Private)	<u>45,300</u> 45,600	<u>45,300</u> 45,600
Water (Lakes)	<u>6,600</u>	<u>6,600</u>
TOTAL	418,700	418,700

*Rounded to the nearest 100 acres

The Federal action of approving modifications to an HCP may have the potential to effect the human environment. The Services' decision of whether to approve proposed modifications to an existing HCP, therefore, may be an action subject to review under the National Environmental Policy Act (NEPA). The Services may decide to prepare a NEPA review document (Environmental Impact Statement or EIS, or in some cases, an Environmental Assessment or EA), and may circulate the environmental review package (HCP document and NEPA document) for public review.

The existing HCP was previously subjected to an environmental review under NEPA, as documented in a Draft EIS and Final EIS, and finalized in a Record of Decision, dated June 27, 1996. The original DEIS and FEIS were also made available for 60- and 30-day public comment and review periods, respectively

~~This~~ ~~The~~ review of the DSEIS involved input from the Services, Plum Creek, other State and Federal agencies such as the Washington Department of Fish and Wildlife, Tribes, and the public. Input was gathered during meetings with the Tribes, interagency meetings, two public scoping meetings, and through letters ~~and telephone calls~~ to the Services.

~~This~~ The Draft Supplemental Environmental Impact Statement (DSEIS) analyzed Plum Creek's proposal to modify its existing HCP as a result of the proposed Plum Creek/ Forest Service land exchange. Following a 52-day public comment period, the Services reviewed and responded to comments in writing ~~possibly~~ by making changes to the proposed HCP modifications document and DSEIS. ~~The~~ This resulting Final Supplemental Environmental Impact Statement (FSEIS) is being circulated for an additional 30-day ~~public review~~ period. Following the 30-day ~~review~~ waiting period, the Services may approve the HCP modifications, and, if so, implementation of the modified HCP will be guaranteed through the existing, legally binding IA.

The remaining sections of this chapter will discuss:

1. Purpose and Need of Proposed Actions;
2. Environmental Review Process;
3. Relationship to Other Plans;
4. HCP Modification Criteria;
5. Scoping Process;
6. Issues and Concerns; and,
7. Overview of the Remaining Chapters.

1.2 PURPOSE AND NEED

1.2.1 SERVICES' PURPOSE

~~The Services' purpose in conducting~~ This environmental review is being conducted to determine the anticipated environmental impact (beneficial or adverse) which will result from implementation of the proposed HCP modification, as compared to the original Federal Action (approval and implementation of the original HCP). The Services' purpose in conducting this action is to extend the requirements of the original HCP, as well as the take authorization, to the newly acquired lands, and to release lands of HCP constraints which are being transferred by donation or exchange to the U.S. Forest Service. Furthermore the Services must determine if the proposed HCP modification is consistent with the standards and procedures for modification set forth in the HCP and IA.

1.2.2 SERVICES' NEED

The Services' need in conducting this environmental review is to respond to Plum Creek's request for modification of its existing HCP, as a result of the proposed land exchange with the Forest Service.

1.2.3 APPLICANT'S PURPOSE

The applicant's purpose is to modify its existing HCP to accommodate the anticipated exchange of lands with the Forest Service.

1.2.4 APPLICANT'S NEED

The applicant's need is to maintain regulatory assurances agreed to under the existing IA and ITP on lands retained within or added to the HCP Planning Area.

1.3 ENVIRONMENTAL REVIEW PROCESS

The environmental review process associated with the original ITP application involved:

- internal, interagency, and tribal scoping;
- 5 pre-scoping meetings
- two public scoping meetings, announced in the Federal Register;
- issuance of a Draft Environmental Impact Statement (DEIS) for a 60-day comment period, announced in the Federal Register;
- issuance of a Final Environmental Impact Statement (FEIS) for a 30-day comment period which addressed public and agency comments receive during the DEIS comment period, announced in the Federal Register; and,
- issuance of a Record of Decision (ROD), announced in the Federal Register.

The environmental review process associated with the applicant's current request for modification of the original HCP is in the form of a Supplemental Environmental Impact Statement (SEIS). The SEIS will focus on the land base change and the anticipated impacts that would result if the proposal is accepted. The SEIS process has involved, and will involve:

- internal, interagency, and tribal scoping;
- 4 public meetings announced in Federal Register in conjunction with the Forest Service;
- issuance of a Draft SEIS (DSEIS) for a 52-day comment period, announced in the Federal Register;
- Two Tribal meetings and two public meetings,
- issuance of a Final SEIS (FSEIS) for a 30-day review which will address public and agency comments receive during the FSEIS comment period, and will be announced in the Federal Register; and,
- issuance of a Record of Decision (ROD) regarding the Services' response to the applicant's proposal, and will be announced in the Federal Register.

No formal public scoping is planned for the environmental review process associated with the SEIS, consistent with 40 CFR 1502.9(c)(4).

1.4 RELATIONSHIP TO OTHER PLANS, REGULATIONS, AND LAWS

A detailed discussion of the relationship between the existing HCP and other plans, projects, regulations, and laws, is presented in the original HCP EIS, and that document is incorporated here by reference. Following is additional information relating to plans or major projects that have been implemented in the region since the ITP was issued to Plum Creek and implementation of the HCP in 1996.

1.4.1 THE INTERSTATE-90 LAND EXCHANGE

At the time of initial approval of Plum Creek's HCP and ITP in 1996, the Services and the Forest Service expressed their hope and intent that conservation benefits of the HCP would be enhanced by future land exchanges between Plum Creek and the Forest Service. Since then, Plum Creek and the Forest Service have negotiated and [Congress has enacted](#) what is known as the I-90 Land Exchange. [The I-90 Land Exchange would transfer some Plum Creek lands currently within the HCP Planning Area to two national forests \(Mount Baker-Snoqualmie and Wenatchee\); and would transfer some lands from three national forests \(Mount Baker-Snoqualmie, Wenatchee, and Gifford-Pinchot\) to Plum Creek within and outside the HCP Planning Area.](#) The overall land exchange is described and analyzed in a Forest Service DEIS, dated April, 1998, which is herein incorporated by reference. Final implementation of the land exchange will be contingent upon approval of the proposed modifications to the HCP.

1.4.2 THE NORTHWEST FOREST PLAN AND RELATED PLANS OR PROJECTS

National Forest Service lands within the HCP Planning Area are managed according to the Land and Resource Management Plans for the Mt. Baker-Snoqualmie National Forest and the Wenatchee National Forest, as amended by the Record of Decision (ROD) for Amendments to Forest Services and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl (USDA Forest Service and USDI Bureau of Land Management, 1994). Although these plans and related EISs (collectively referred to as the Northwest Forest Plan) were considered in the DEIS and FEIS completed in conjunction with Plum Creek's original HCP, and have been incorporated by reference herein, it is important to reiterate that lands obtained by the Forest Service through the I-90 Land Exchange must be managed consistent with the ~~strict~~ requirements of the Northwest Forest Plan. [A part of the National Forest System Lands within the HCP Planning Area are also managed under the Snoqualmie Pass Adaptive Management Area Plan \(SPAMA\) \(USDA Forest Service and USDI Fish and Wildlife Service, 1997\), prepared under the direction of the NWFP. SPAMA was completed following the issuance of the Plum Creek Incidental Take Permit. In November, 1997, the Forest Service amended the Forest Plans of the Wenatchee and Mt. Baker-Snoqualmie National Forests, as previously amended by the 1991 ROD for the NWFP, to include specific standards and guidelines for this Adaptive Management Area .](#)

The Northwest Forest Plan (NWFP) requires that ecosystem management be applied to all Forest Service lands within the Planning Area of the HCP. All Federal lands subject to the NWFP are allocated to one or more of six designated categories for management [i.e., Late-Successional Reserves (LSRs); Adaptive Management Areas (AMAs); [Managed Late Successional Areas](#); Administratively Withdrawn Areas; Congressional Withdrawn Areas, and Riparian Reserves]; ~~and Key Watersheds~~ or one undesignated category labeled Matrix. Generally, each of the six designated categories emphasizes management for the enhancement of terrestrial and aquatic fish and wildlife habitats. ~~For undesignated Matrix lands, there is less emphasis on ecosystem management for the maintenance and improvement of habitat.~~ [Although undesignated Matrix lands are managed differently, there is the same level of emphasis on ecosystem management for the maintenance and improvement of habitat as the designated categories, even if proportionally less late-seral habitat would be expected in the future.](#)

It is on the basis of the NWFP and its management designations ([including resultant amendments to Forest Plans](#)) that the existing Plum Creek HCP contemplates future land exchanges to maintain or improve the biological integrity of the HCP Planning Area. Scenarios that increase Federal ownership and management

for LSR and AMA and reduce Matrix lands and timber harvest within the Planning Area are presumed to maintain or improve the function of the HCP. The I-90 Land Exchange is consistent with these land-exchange scenarios and is favorable to habitat conservation.

Following implementation of the I-90 Land Exchange, a large portion of the lands acquired by the Forest Service would be managed in accordance with ~~SPAMA, the Snoqualmie Pass Adaptive Management Area Plan (SPAMA).~~ Under SPAMA, newly acquired Federal lands would be managed to provide for organisms associated with late successional forests, and to contribute to critical wildlife connectivity objectives within the AMA, a distribution of forest age and structural classes and stream environments that provide habitat for late successional and old growth plant and wildlife species on National Forest System lands.

It is assumed, for purposes of analysis, that during implementation of the HCP, the Forest Service will continue to implement the Northwest Forest Plan and amended National Forest Plans on all Federal lands under its jurisdiction in the Planning Area. Assumptions are further described in the HCP modification document, Section 2.2.3.

1.4.3 OTHER HABITAT CONSERVATION PLANS

Subsequent to the approval of Plum Creek's HCP the Washington Department of Natural Resources (DNR) received approval for a HCP covering 1.6 million acres in the State. The complexity of the DNR HCP precludes Plum Creek or the Services from being able to model the specifics for the relatively small amount of DNR ownership in the Planning Area. Therefore the lands were modeled as though the HCP does not exist ~~which is a conservative biological approach.~~ The DNR HCP on the east side of the crest does not address unlisted species as occurs on the west side. The primary strategy for listed species influencing land management east of the crest is the spotted owl strategy. One section of DNR HCP land exists in the upper Green River and is designated for management providing nesting habitat. East of the Cascades Crest, DNR ownership is scattered with management focus evenly divided between nesting and foraging objectives. The HCP contains with additional measures for bald eagles, peregrine falcons, grizzly bears, and gray wolves. However, these strategies are dependent on presence being detected and are very site specific. Since the east side strategy is not multiple species, riparian areas and other special habitats do not receive the enhanced protection of an HCP but are protected by State Forest Practice Rules and Regulations and the DNR's internal policies. West of the crest the HCP covers multiple species and has enhanced riparian and special habitat requirements, which exceed state regulations.

The City of Tacoma has notified the Services of their intent to prepare an HCP and request an Incidental Take Permit for lands already covered by their Green River Watershed Forest Land Management Plan. The HCP is expected to be comparable to the existing plan. ~~A Draft HCP was released for public review in November 1998 (Tacoma Public Utilities, 1998).~~ Draft NEPA and HCP documents are expected to be released for public comment during 1999.

1.4.4 OTHER PRIVATE OWNER ACTIONS

A number of actions have been proposed or refined since 1996

The summit at Snoqualmie Ski Area has proposed to update its master plan to include additional chair and surface lifts, addition of a multi-user gondola and restaurant, addition of new lifts and ski terrain within existing special-use permit (SUP) boundary, adjustments of the boundary for crossover trails, expanded

night skiing, additional of parking lots within and outside the SUP boundary, day lodges and other related facilities, maintenance facilities and utilities to support the ski area operations and other year-round recreational opportunities.

A cross-cascades pipeline has been proposed that would be buried under existing right-of-ways for the majority of its length through the Planning Area. It is proposed to be buried under streams at crossing sites which are currently undisturbed as power lines merely go overhead at many such streams and low-topographical-relief areas. There would be some removal of forest at such crossing sites. The pipeline would carry petroleum products under high pressure in a general northwest-to-southeast direction across the Planning Area. A draft EIS was recently released by the U.S. Forest Service with regard to this project.

At River Mile 64.5, Howard Hanson Dam is operated for flood control. It is federally owned and operated and was originally authorized and constructed without fish passage facilities in 1962. At River Mile 61.0, Tacoma Headworks Diversion Dam is operated to supply municipal and industrial water to the City of Tacoma and surrounding communities. The Headworks Diversion Dam and associated facilities also interfere with fish passage.

Since 1982, juvenile coho salmon, chinook salmon, and steelhead trout have been reintroduced into the upper watershed under Tribal and State management. The City of Tacoma currently operates a temporary adult fish trap at the Headworks Diversion Dam. Trapped adult steelhead trout are either released above the Howard Hanson Dam located 3.5 miles upstream of the Diversion, or a selected few are used to rear fry for outplanting in the upper watershed. Adult salmon are not currently released above Howard Hanson Dam, but such releases are planned to begin when downstream passage facilities at Howard Hanson Dam are completed as part of the proposed Additional Water Storage project.

The City of Tacoma plans to raise the existing diversion dam about 6.5 feet extending the inundation pool 2,570 feet upstream of the Headworks Diversion Dam. These plans include provisions for upgrading fish screens, bypass facilities for downstream passage, and installation of a trap-and-haul facility for upstream fish passage.

A separate project is proposed for the Howard Hanson Dam and is known as the Additional Water Storage project. This project would raise the existing summer conservation pool by 36 feet from 1,141 to 1,177 feet. This project would add 37,000 acre-feet of storage used for municipal water and downstream instream flows. This project would also provide structural features to allow downstream fish passage and management of flows to enhance downstream survival of outmigrating salmonid smolts. The project also includes a variety of aquatic habitat and wildlife habitat mitigation and restoration.

1.5 HCP MODIFICATION CRITERIA

Section 7.3.2 of the IA requires that the Services approve Plum Creek's request to modify its existing HCP provided the following criteria are satisfied.

- For a land sale or exchange to the Federal Government, the proposed HCP modifications must not compromise the effectiveness of the HCP.

- For the acquisition of lands in the Planning Area and inclusion under the HCP, the proposed HCP modifications must not increase the level of incidental take of Permit Species beyond that analyzed and authorized in the original HCP and ITP.

In addition, under Section 7 of the ESA, the proposed modification may be approved, provided the proposed HCP modifications do not jeopardize any species listed for protection under the Endangered Species Act or adversely modify designated critical habitat for such species.

1.6 SCOPING PROCESS

The scoping process associated with this FSEIS consisted of internal scoping between the ~~applicant~~ Permittee and the Services, and interagency scoping conducted between the Services and Environmental Protection Agency, Washington Department of Fish and Wildlife, other State agencies, and Tribes. No formal public scoping was conducted, consistent with 40 CFR 1502.9(c)(4).

The internal scoping process resulted in the development of the alternatives discussed and analyzed in the subsequent chapters of this document. Issues and concerns identified during the scoping process are discussed in section 1.7 below.

1.7 ISSUES AND CONCERNS

Issues and concerns identified during the scoping process include the following:

- Will the proposed HCP modifications maintain or improve the biological integrity of the HCP?
- Will the proposed HCP modifications increase the level of incidental take of Permit Species beyond that analyzed and authorized in the original HCP and ITP?
- Will the proposed HCP modifications jeopardize any species listed for protection under the Endangered Species Act or adversely modify designated critical habitat for such species?

1.8 OVERVIEW OF THE REMAINING CHAPTERS

Following is a brief overview of the remaining chapters in this document.

Chapter 2 – Alternatives, Including the Proposed Action. This chapter presents alternatives identified during the scoping process of this environmental review.

Chapter 3 – Affected Environment. This chapter describes the human environment which will be affected by the implemented alternative. Much of the information pertaining to the human environment within and surrounding the Planning Area has remained essentially the same since the original EIS associated with the original Plum Creek HCP was finalized in June 1996. In most instances where this is the case, this FSEIS provides a brief summary and references the appropriate section in the original EIS for an expanded discussion. Updated information is included in the text where necessary.

Chapter 4 – Environmental Consequences. This chapter compares the consequences (impacts or effects) associated with each of the alternatives considered. A Cumulative Effects section is included at the end of this chapter. This section addresses the cumulative impacts on the environment resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such actions.

CHAPTER 2 ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.1 INTRODUCTION

This chapter presents alternatives identified during the internal scoping process of this environmental review. Five alternatives were identified, three of which are analyzed in detail in Chapter 4 (Environmental Consequences), and two of which were considered but eliminated from detailed analysis. The remainder of this chapter is divided into two sections. Section 2.2 defines each of the alternatives considered and analyzed. Section 2.3 discusses alternatives considered but eliminated from detailed analysis.

2.2 ALTERNATIVES CONSIDERED AND ANALYZED

The three alternatives analyzed in detail are listed below. Following this listing is an expanded description of each of the alternatives.

1. Alternative 1 (No Action) - no land exchange would occur, and Plum Creek lands would continue to be managed as prescribed in the original HCP, and all minor HCP modifications which have occurred to date.
2. Alternative 2 (Partial HCP) – land exchange would occur, and Plum Creek lands transferred to the Forest Service would be eliminated from the HCP ~~Planning Area and~~ covered lands and instead be managed under the Northwest Forest Plan (NWFP) and amended Forest Plans (i.e., Snoqualmie Pass Adaptive Management Plan), and new lands acquired from the Forest Service would **not** be managed under Plum Creek’s HCP.
3. Alternative 3 (Proposed Action) - land exchange would occur, and Plum Creek lands transferred to the Forest Service would be eliminated from the HCP ~~Planning Area and~~ covered lands and instead be managed under the NWFP and amended Forest Plans (i.e., Snoqualmie Pass Adaptive Management Plan), and new lands acquired from the Forest Service **would** be managed under Plum Creek’s HCP.

2.2.1 ALTERNATIVE 1 – NO ACTION

In order to provide a baseline against which the action alternatives in this environmental review can be compared, the No Action Alternative makes two assumptions: (1) no land exchange would occur; and, (2) management of the lands would continue as prescribed in the original HCP, plus all HCP modifications that have occurred to date. The No Action Alternative would, therefore, be a continuation of the current management approach.

The current management approach specified under the HCP is discussed in detail in the Draft and Final Environmental Impact Statements (Raedeke Associates 1996) associated with the original HCP, and are incorporated here by reference. Following is a summary of the management prescriptions.

The No Action Alternative involves a network of riparian habitat, harvest deferrals, and dispersal corridors on private lands to link habitat on ~~adjacent~~ interspersed Federal lands and provide supplemental late-successional habitat in key areas identified by the amended Forest Plans of the NWFP thereby forming

linkages between Federal lands. The No Action Alternative provides economically viable and biologically valuable nesting, roosting, and foraging (NRF) habitat and foraging/dispersal (FD) habitat. On Plum Creek land, the No Action Alternative would defer harvest of some NRF habitat for 20 years and require maintenance of FD habitat through selective-harvest to support 30 of the most-productive spotted owl sites where Plum Creek is a significant owner of NRF and FD habitat. All NRF harvest deferrals and FD corridors include restricted habitat within 1.8-mile radius owl circles. NRF and FD habitat ~~in 1.8-mile circles~~ not included ~~in the No Action Alternative~~ as deferrals, corridors, or as riparian habitat areas (RHAs) would be available for harvest consistent with landscape-level habitat targets.

The No Action Alternative complements the NWFP, SPAMA, and the Spotted Owl Final Draft Recovery Plan because habitat reservations are prioritized for Plum Creek's lands interspersed with ~~within~~ federally designated LSRs and AMAs. Similarly, the spotted owl sites prioritized by Plum Creek for habitat protection are in high-density "cluster areas" within the Spotted Owl Recovery Plan Designated Conservation Areas (DCAs). To address long-term habitat conditions, the No Action Alternative establishes projections for percentages of Plum Creek land to be maintained in diverse forest structural stages ranging from stand initiation to old-growth throughout the HCP Period. Additional harvest deferrals include six management units containing goshawk sites for 20 years and potential murrelet habitat until surveys are completed. Species-management plans are being implemented for the spotted owl, marbled murrelet, grizzly bear, and gray wolf. The No Action Alternative addresses habitat needs for over 281 additional species. The No Action Alternative also specifies management practices for special habitats such as snags and talus slopes that are more extensive than would have occurred without the HCP.

This alternative focuses on providing supplemental stream protection to address resident and anadromous fish habitat concerns and complementing the NWFP's Aquatic Conservation Strategy. In addition to measures required under state regulations, the No Action Alternative includes Riparian Habitat Areas (RHAs) and Riparian Leave Tree Areas (RLTAs) to protect watershed values and provide a diverse mosaic of habitat for wildlife species, including spotted owls. Intensive management practices have been reduced or eliminated in RHAs. To address specific water-quality concerns, special consideration is given to fish-bearing streams and adjacent habitat areas that ~~have been~~ were listed (as of 1996) by the Washington State Department of Ecology as water-quality limited. Watershed analysis has been prioritized for watersheds in the Planning Area and is currently underway.

2.2.2 ALTERNATIVE 2 – PARTIAL HCP

Alternative 2 involves the same strategies for forest management, timber harvest, habitat conservation, mitigation, and monitoring as in the No Action Alternative. This alternative, however, involves a modified land ownership in the HCP Planning Area. This modification involves Plum Creek's lands included in the original HCP (~~47~~120,600 acres), lands acquired from the Forest Service (~~40,800~~10,200 acres), and Plum Creek lands transferred to the Forest Service (~~49,200~~53,400 acres)(Figure 1). None of the Forest Service lands acquired by Plum Creek in the land exchange would be managed under the HCP. Instead, they would be managed using a combination of State Forest Practice Rules and Regulations and Plum Creek's Environmental Principles. Take of listed species resulting from actions on these lands would be prohibited per Section 9 of ESA. The resulting landbase covered by the HCP under this alternative would be ~~47~~121,200 acres. The Planning Area would also include ~~40,800~~ 10,200 acres of Plum Creek land that would be managed under State Forest Practice Rules and Regulations.

2.2.3 ALTERNATIVE 3 – PROPOSED ACTION

The Proposed Action involves the same strategies for forest management, timber harvest, habitat conservation, mitigation, and monitoring as in the No Action Alternative. This alternative involves exactly the same modifications in land ownership as under Alternative 2, however, all of the Forest Service lands acquired by Plum Creek in the land exchange would be managed under its HCP. The resulting landbase covered by the HCP under this alternative would include ~~128,000~~ 131,200 acres.

2.2.4 COMPARATIVE ANALYSIS OF THE ALTERNATIVES

Comparative analysis of the alternatives contained in Chapter 4, Environmental Consequences, are based on:

1997 STAND INVENTORY DATA of Plum Creek's current and anticipated ownership in the Planning Area, versus the 1994 STAND INVENTORY DATA used in the environmental analysis associated with the original HCP;

modeling using the forest estate planning model OPTIONS, versus the FIBRPLAN modeling technique used in the environmental analysis associated with the original HCP;

organization of data used in the modeling process in FOREST INVENTORY POLYGONS, versus MANAGEMENT UNITS used in the environmental analysis associated with the original HCP.

The use of updated data and modeling were envisioned to be minor modifications and are addressed in Section 5.3.5 of the original HCP, which states:

Another example (of circumstances that may warrant flexibility and administration as minor amendments) might be minor modification or alteration of stand structure/Lifeform habitat projections that are based on the results of monitoring over time or new information from the increasing body of scientific literature. The data and models used to prepare the HCP will be updated from time to time to increase the accuracy and amount of information available. In addition, management units developed for the analysis may be restructured to better reflect operational constraints. More accurate information on forest stand structures will improve Plum Creek's ability to evaluate the availability of habitat for the various Lifeforms. Projections of stand structures and lifeform habitat could be impacted during the Permit period, with no discernible physical change to the landscape or harm to the species. The stand structure classifications used in the HCP will be projected annually as new information becomes available.

For the purposes of this environmental review, these inventory data and modeling methodology updates are part of the underlying request for a minor modification. The requested inventory data and modeling updates are consistent with guidelines for implementing minor modifications detailed in the Services HCP Handbook (USDI and USDC 1996c). An expanded discussion relating to these updates is provided in Appendix 2 of the HCP Modification Document (Plum Creek 1998).

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Two alternatives were considered but eliminated from detailed analysis. The first, Approve HCP Land-Base Exchange and Require Additional HCP Prescriptions, was eliminated from detailed analysis because any additional prescriptions would be beyond the scope of the original HCP and inconsistent with assurances guaranteed to Plum Creek under the IA and the No Surprises Policy. The second, Relinquish ITP and Dissolve HCP, was eliminated from detailed analysis because it would not achieve the Services' or Plum Creek's purpose and need as defined in Section 1.2 and it would violate the existing IA.

CHAPTER 3 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter discusses and describes the environment in and around the HCP Planning Area. For the purposes of this discussion the environment is separated into 11 categories. These categories correspond to the remaining sections of this Chapter, and include:

3.2 Land Use and Land Ownership

3.3 Landform and Geology

3.4 Air Quality

3.5 Water Quality and Quantity

3.6 Vegetation

3.7 Wildlife

3.8 Fish and Fish Habitat

3.9 Socio-economic

3.10 Cultural Resources

3.11 Recreation

3.12 Visual Resources

Much of the information pertaining to the human environment within and surrounding the Planning Area has remained essentially the same since the original EIS associated with the original Plum Creek ITP/HCP was finalized in June 1996. In most instances where this is the case, this FSEIS provides a brief summary and references the appropriate section in the original EIS for an expanded discussion. Updated information is included in the text where necessary.

3.1.1 ENVIRONMENTAL SETTING

The Planning Area is located in the Eastern and Western Cascade Provinces in the Cascade Mountains of Washington. The central and southern portions of the Western Province are dominated by humid forests comprised primarily of Douglas-fir and western hemlock at mid-to-low elevations and noble fir, Pacific silver fir, and mountain hemlock at higher elevations. Pacific silver fir and mountain hemlock are also found at higher elevations on the eastern side of the Cascade crest. Relatively mild climatic conditions and moist winters in the Western Province provide excellent conditions for forest growth. Summers are normally short, dry, and sunny, while winters are characterized by abundant precipitation, including heavy snowfall at higher elevations.

The central and southern portions of the Eastern Cascade Province are dominated by mixed-conifer (grand fir, Douglas-fir, western larch, western white pine, lodgepole pine) and forests dominated by ponderosa pine forests at mid-to-lower elevations and by true fir (subalpine) forests at higher elevations. Forests in this region are highly fragmented due to poor soils, high fire frequencies, alpine meadows, and past timber harvesting. At lower elevations and especially on south-facing slopes, dryness is a significant factor in the

fragmentation of the forests. Wildfire has played a major role in shaping the forests in both the Eastern and Western Cascades Provinces. Recent efforts at fire suppression, especially in the eastern Cascades, and selective timber-harvesting practices have resulted in shifts in tree species composition and forest structure in some areas. Late-successional forests, especially east of the Cascade crest, have become increasingly susceptible to catastrophic fires and epidemic attacks of insects and disease.

There are extensive areas of late-successional forest in the region, primarily on Forest Service lands. These lands include: the Alpine Lakes Wilderness north of the Planning Area, Norse Peak Wilderness to the south, and other late-successional and old-growth forests on managed Forest Service ([i.e., SPAMA](#)) and private lands in between.

Plum Creek's ownership within the Planning Area is located north and south of the Interstate 90 (I-90) corridor in central Washington, between 60 to 100 miles east of Seattle. Habitat surrounding the I-90 Corridor has been identified as an "area of concern" in several recent forest-management studies (Thomas et. al., 1990; Lujan et. al., 1992; Thomas et al., 1993). The area has strategic importance for north/south and east/west distribution of species like the spotted owl.

3.1.2 PLUM CREEK'S CASCADE TIMBERLANDS

Plum Creek will own~~ed~~ and managed approximately ~~310,000~~273,000 acres of primarily second-growth forestland in the central Cascade Mountain Range. Plum Creek's ownership pattern in the Planning Area (i.e., I-90 Corridor) is generally of the "checkerboard" configuration, and consists of ~~169,200~~131,200 acres of alternating sections (1 section = 1 square mile) interspersed mainly by Forest Service lands (Figure 1 and Table 1). Plum Creek also maintains timber rights to 1,400 acres of land owned by the City of Tacoma. The predominant nonfederal land use in the I-90 Corridor and surrounding areas is commercial timber production. Federal lands are managed for multiple uses including commodity production, watershed, recreation, and wildlife.

Plum Creek manages its lands in the Planning Area in three administrative subunits: (1) the I-90 Lakes Subunit is located east of the Cascade crest and north of the I-90; (2) the Taneum Subunit is located east of the Cascade crest and south of I-90; and (3) the Green River Subunit is located west of the Cascade crest and south of I-90, primarily in the Green River watershed.

3.2 LAND USE AND LAND OWNERSHIP

Although there have been two previous land transactions within Plum Creek's HCP Planning Area, the proposed Plum Creek/ Forest Service land exchange will represent the most significant change in land ownership within the Planning Area since completion of the original EIS for Plum Creek's ITP/HCP. The other land transactions involving lands within the HCP Planning Area include a land exchange between Weyerhaeuser Company and the Forest Service (i.e., the Huckleberry Ridge land exchange) and a land sale between Plum Creek and the Forest Service (i.e., Silver Creek land sale). The Huckleberry Ridge land exchange totaled approximately 34,500 acres, resulting in approximately ~~34,200~~ acres of Forest Service lands in the HCP Planning Area transferred to Weyerhaeuser. In 1997, Plum Creek and the Forest Service concluded the Silver Creek land sale. Approximately 960 acres of Plum Creek's ownership in the HCP Planning Area were sold to the Forest Service. As a result of the Huckleberry Ridge land exchange and the

Silver Creek land sale, Federal ownership in the HCP Planning Area decreased since the original HCP was implemented.

A brief discussion of land use and land ownership within and surrounding the Planning Area is provided below. An expanded discussion is provided in Section 3.2 of the original EIS, and is incorporated here by reference.

The Planning Area is located within east King County and west Kittitas County. The area includes 418,700 acres of land bisected by I-90. Most of the Planning Area is within the Mt. Baker-Snoqualmie and Wenatchee National Forests. It is bounded on the north by the Alpine Lakes Wilderness and on the south by the Norse Peak Wilderness. The Cedar River Municipal Watershed (City of Seattle) is located northwest of the Planning Area with only a small portion lying within the Planning Area. The Green River Municipal Watershed (City of Tacoma) is located adjacent to and south of the Cedar River Watershed. The latter watershed covers a large portion of the Planning Area. ~~Both municipal watersheds are closed to the public.~~ The Planning Area is not contiguous to any tribal reservations or National Parks, nor does it include any incorporated cities. However, ~~this~~ the HCP Planning Area is an important area to several Native American Tribes.

Plum Creek owns land or timber rights on ~~170,600~~131,200 acres within the HCP Planning Area. The remaining acreage is owned and/or administered by the Forest Service, DNR, Seattle Water Department, Tacoma Public Utilities, and a number of private landowners. Land ownership is illustrated in Figure 1 and tabulated in Table 1.

The prominent land use on State and private lands in the HCP Planning Area is commercial timber production. Federal lands are managed for multiple uses including commodity production, watershed, recreation, and wildlife. ~~Federal lands are used for a number of activities such as timber production and recreation.~~ Private lands within the Planning Area must conform with uses set forth in State, county, and local land-use plans.

3.3 LANDFORM AND GEOLOGY

A brief discussion of landform and geology within and surrounding the Planning Area is provided below. An expanded discussion of landform and geology and their effects on soils, surface erosion, and mass wasting, is provided in Section 3.3 of the original EIS, and is incorporated here by reference.

The Planning Area is within the Cascades Ecoregion (Omernik 1987, found in Jensen 1995) and occupies portions of two different geologic landforms, the North Cascades landform and the South Cascades landform (Easterbrook and Rahm 1970). In addition, the extreme southeast panhandle of the Planning Area borders the Columbia Basin Landform (Easterbrook and Rahm 1970). Underlying the surficial landforms are geologic formations. Geologic formations or districts consist of major structural features that are of distinctive rock types (Jensen 1995). Within the Planning Area there are six different geologic districts: sandstone, basalt, andesite, mixed volcanic, granite and metamorphic. The distribution of rock types is used in the evaluation of slope stability and soil erosion in the Planning Area during the watershed analysis resource assessment and prescription phases.

3.4 AIR QUALITY

Following is a brief discussion of air quality within and surrounding the Planning Area. An expanded discussion is provided in Section 3.4 of the original EIS, and is incorporated here by reference.

The Federal Clean Air Act, as amended in 1990, was designed to reduce air pollution, protect human health, and preserve the Nation's air resources. Several air-quality programs under the Clean Air Act regulate various practices such as prescribed burning. The National Ambient Air Quality Standards (NAAQS) are set to protect human health and welfare.

The Clean Air Act requires each State to develop, adopt, and implement a State Implementation Plan (SIP) to ensure that the NAAQS are attained. SIPs contain additional regulations for areas that have violated one or more of the NAAQS. These areas are called "non-attainment areas". Non-attainment areas in the region include the urban centers of Seattle, Kent, and Tacoma. There are no non-attainment areas in the Planning Area.

Washington has a SIP that has been approved by the Environmental Protection Agency (EPA) which regulates the criteria pollutants emitted from prescribed burning. Washington's plan addresses particulate matter (PM10), visibility, and smoke.

Washington's Forest Practices Act (FPA), as administered by the DNR, implements the State SIP on forestlands. FPA rules, regulations, and BMPs ensure that fugitive dust from roads and smoke from prescribed burning do not violate the SIP standards. Until the mid-1980's, prescribed burning was commonly used to dispose of harvest residue (slash burning) and to reduce moisture stress and growing-space competition from other on-site vegetation. Slash burning was also used to reduce wildfire hazard and to prepare harvest sites for planting. In the period 1979 to 1984, Plum Creek averaged 800 acres per year of controlled burns. Since 1990, there have been no controlled burns on Plum Creek land in the Planning Area. In most cases, residue is left in place to enhance habitat for wildlife and maintain soil productivity, or piled and left to decay. Should burning be necessary, slash would be likely piled following the harvest and not burned until fall or winter when meteorological conditions and State regulations permit.

3.5 WATER QUALITY AND QUANTITY

A brief discussion of water quality and quantity within and surrounding the Planning Area is provided below. An expanded discussion is provided in Section 3.4 of the original EIS, and is incorporated here by reference.

3.5.1 MAJOR SUBBASINS

Two major Subbasins are located within the Planning Area: the Green River Subbasin west of the Cascade crest and the Yakima River Subbasin east of the crest.

3.5.1.1 THE GREEN RIVER SUBBASIN

The Green River Subbasin encompasses 483 square miles. The Green River begins on the western slopes of the Cascade Mountains near Blowout Mountain, and terminates at Elliott Bay in Puget Sound, 90 miles to the northwest (Figure 3; DEIS, 1996). Thirty miles downstream from its source, the Green River encounters the Howard Hanson Dam at River Mile (RM) 64.5 and at RM 61 the Tacoma Water Diversion Dam. In total, the Green River Subbasin conveys an average annual 965,800 acre-feet of water over 640 linear miles of rivers and streams. The primary use of water in the Green River Subbasin is for public drinking-water supply and irrigation. Other uses include rural domestic and industrial demands.

The upper Green River basin, defined as the area above the City of Tacoma's diversion dam, encompasses ~~110,482~~^{36,073} acres in the HCP Planning Area with ownership divided ~~almost equally~~ between National Forest (~~30~~⁴⁸ percent) and non federal land (~~70~~⁵² percent). The principal nonfederal landowners include Plum Creek and the City of Tacoma.

Land use in the upper Green River basin consists mainly of timber harvesting and the water supply for the City of Tacoma, as well as recreation and wildlife. Approximately 49 percent of the Subbasin has been harvested within the past 50 years with an associated road density of about 4.5 miles of roads per square mile of land. Recreational use of the area is minimal because much of the upper basin is ~~closed to the public~~ access limited to protect it as a water supply. Rural activities and urban development dominate the lower portions of the watershed.

The mainstem of the Green River in the upper watershed is relatively straight with little braiding. From its headwaters near Blowout Mountain, the Green River flows northwest 10 miles to its confluence with Sunday Creek at RM 84.2, then west six miles to Champion Creek (RM 78.1). The major tributary is Sunday Creek. Other large tributaries include Twin Camp, Tacoma, Friday, Sawmill, Rock, and Champion Creeks. In total, there are 21 tributaries adding more than 137 linear miles of stream. Most of the upper Green River basin, plus major sections of tributaries are within the Mt. Baker/Snoqualmie National Forest.

3.5.1.2 THE YAKIMA RIVER SUBBASIN

The Yakima River Subbasin (Figure 4; DEIS, 1996) encompasses 6,155 square miles and contains approximately 1,900 RMs of perennial streams. The Yakima River originates near the crest of the Cascade Range above Keechelus Lake at an elevation of 6,900 feet and flows southeastward for 214 miles to its confluence with the Columbia River at RM 335.

Predominant land use within the Yakima Subbasin includes irrigated agriculture (1,000 square miles), urbanization (50 square miles), timber harvesting (2,200 square miles), ~~and~~ grazing (2,900 square miles), recreation, and wildlife.

The mainstem of the Yakima River is highly developed for irrigation agriculture and contains six major diversion dams, as well as several smaller dams located on the Naches River and other rivers.

Water supplies are severely overtaxed by the competing demands of irrigation and instream flows for fish production. Consequently, instream flows are rarely optimal in the Subbasin, including the streams and tributaries in the HCP Planning Area, and they may be critically low for fish production in drought years.

In an average year, the total available water supply in the Subbasin is barely adequate for irrigation and never adequate for maximum fish production (YIN et al. 1990).

3.6 VEGETATION

A brief discussion of forest and riparian vegetation within and surrounding the Planning Area is provided below. An expanded discussion is provided in Section 3.6 of the original EIS, and is incorporated here by reference.

The approximate percentage of the forest structural stages in the HCP Planning Area in 1996 are shown below (see HCP Section 2.3, for a discussion of the stand structure classification system):

stand initiation stage, 8 percent
shrub/sapling stage, 3 percent
young forest stage, 19 percent
pole-timber stage, 5 percent
dispersal forest stage, 13 percent
mature forest, 25 percent
managed old-growth, 8 percent
old-growth, 6 percent

The eight structural stages incorporate approximately 87 percent of the total area in the Planning Area (Table 30 in the HCP provides an estimated projection of structural stages in the HCP Planning Area to the year 2045 based on the 1994 forest inventory. Table 30A (included in the HCP modification document) provides revised projections of forest structural stages based on the 1997 forest inventory). The remaining 13 percent represents non-forested areas which includes lakes, streams, rock, grass, brush, ~~swamps~~, and other non-forested areas.

3.7 WILDLIFE

3.7.1 WILDLIFE OVERVIEW

The HCP is based upon the concept that habitat conditions are the primary determinants of the number of wildlife species and numbers of individuals in a given area. Habitat conditions include factors such as vegetation structure, plant species composition, presence and abundance of special habitats (both vegetative and non-vegetative), as well as environmental factors such as climate (moisture, temperature regimes, etc.), elevation, slope, aspect, landscape position, disturbance history and frequency, soils, and geologic history. Further, vegetation structure, rather than plant species composition, is often the primary determinant of habitat preference by vertebrate wildlife species (Brown 1985). Vegetation communities, environmental factors, and special habitat features have been discussed in previous Sections.

Based on the information compiled to date, over 285 terrestrial and amphibious vertebrate species may find suitable habitat in the Planning Area. Of this total, 36 species have special State or Federal status

(endangered, threatened, sensitive, or candidate). Bull trout, salmon, and other fish species are discussed in SEIS Section 3.8. The four wildlife species covered by the incidental take permit under section 10(a) of the ESA, the northern spotted owl, marbled murrelet, grizzly bear, and gray wolf, are discussed in detail in Section 3.7.2. Seventeen wildlife species and three fish species designated “Special Emphasis Species (HCP Section 3.7.3) are expected to occur within the Planning Area, have a high expectation for Federal listing, and are not the subject of an existing recovery plan. Eleven additional wildlife species have been designated “Species of Concern” and are discussed in Section 3.7.4. These species may have special status but are already addressed by recovery plans (e.g., bald eagle, peregrine falcon) or are not thought to be present in the Planning Area (e.g., western pond turtle, black tern). The remaining species are discussed as grouped assemblages in Section 3.7.5. The following Sections summarize discussions of wildlife found in the HCP document, its appendices, and supporting reports.

3.7.2 SECTION 10(A) SPECIES

Bull trout are discussed in Section 3.8.

3.7.2.1 NORTHERN SPOTTED OWL (*STRIX OCCIDENTALIS*) (HCP SECTION 2.10.1)

~~Owl Surveys in the Planning Area.~~ Since June of 1996, Plum Creek has continued to survey for spotted owls according to the requirements of HCP monitoring (HCP Modification Document; Figure B). The HCP required two years of monitoring at the beginning of the permit period to establish a baseline for the validation of the Resource Selection Probability Function model used in the HCP and described by Irwin and Hicks (1995).

The validation and demographic surveys were conducted over about 100 square miles of the Planning Area with monitoring/demography areas located in each major portion of the Planning Area. All surveys for spotted owls in the Planning Area were conducted in accordance with guidelines established by the FWS (USFWS 1992). Exceptions to the established protocol were that slightly wider spacing between survey stations was allowed and only two survey visits per year were required. Nest sites were revisited to document success of reproductive efforts. The surveyed area included approximately 34 known owl sites and included 16 of the 30 deferral sites. One additional site was discovered during these surveys, and another during project-level surveys. Project-level surveys are pre-harvest investigations in areas likely to contain owl sites that are designed to confirm presence or absence of owls. Such project-level surveys are important because known owl nests receive seasonal protection from disturbance and because knowledge of owl locations provide additional conservation opportunities.

It is estimated that greater than 98 percent of the spotted owls encountered during surveying and monitoring were captured and banded with individual numbered colored leg bands. Plum Creek banded 95 juveniles and 16 new adults and subadults since the 1996 season. Additional telemetry investigations occurred to refine Plum Creek’s understanding of habitat utilization on the west side of the Cascades crest. No significant new information was obtained regarding home range size or the occurrence of barred owls.

There are currently 106 site centers located within the Planning Area and its analysis buffer. Two additional sites were discovered during HCP monitoring surveys and project-level surveys, and 3 sites were decertified by Plum Creek and/or DNR (WDFW 1997) following the standard procedures outlined by WDFW (~~WDFW 1997~~). As a result, approximately the same numbers of site centers occur on or near Plum Creek’s

ownership within the Planning Area. One of the newly discovered sites was peripheral to the Planning Area boundary as was one of the decertified sites, Charlie Creek. Within the Planning Area, the newly discovered Kachees Ridge site is an additional deferral site in the HCP modification. Plum Creek had also voluntarily added two deferral sites so that 32 owl sites are currently benefiting from the existing deferral strategy. Two of the sites decertified by WDFW (Cooper River and South Cle Elum Ridge) were sites which otherwise would have been impacted by Plum Creek operations within the first 20 years of the HCP.

Not all site centers are occupied in any one-year and several site centers in an area may be associated with a single owl or a pair. When accounting for juvenile emigration, the population trend in the Planning Area is believed to be stable or increasing slightly based on recent demographic work in and around the Planning Area (Forsman et al. 1996; USFWS 1996). Additional data are needed to make reliable population trend estimates, but the trend appears to be very sensitive to the number of good or bad reproductive years analyzed in the database.

To maximize the effectiveness of conservation measures and more fully describe impacts of alternatives to spotted owl sites, Plum Creek developed a "prioritization schedule" for spotted owl sites (HCP modification, Table 22A).

Of the 106 currently known spotted owl site centers, only 66 within the Planning Area contain 100 acres or more of habitat on Plum Creek's ownership within a 1.8-mile radius and have been recently occupied, based on demographic surveys. Among these, 17 are considered unlikely to be affected by Plum Creek's forest-management activities because either, (1) habitat on Plum Creek's land was present only at the outer edges of the 1.8-mile management circle and this habitat was often isolated from the site center by prominent ridges that lack habitat or by lakes, or (2) the site centers were located on Forest Service ownership which contained sufficient habitat, based on the RSPF model (HCP Section 2.9, Table 22; Irwin and Hicks 1995).

3.7.2.2 MARBLED MURRELET (*BRACHYRAMPHUS MARMORATUS*) (HCP SECTION 2.10.2)

Portions of the Planning Area are within the Marbled Murrelet Critical Habitat Units designated by the Service (May 24, 1996 Federal Register {61 FR 26256-26320}). Approximately 6,800 acres of critical habitat have been designated in the Planning Area (USFWS 1996) but no critical habitat is located on current Plum Creek lands. However, critical habitat is being considered for exchange to Plum Creek from the Forest Service. To address the concern regarding approximately 2,100 acres of critical habitat being transferred to private ownership, the Forest Service and Plum Creek have discussed a compensatory course of action to be included in the proposed land exchange. That action is also part of the proposed and partial modification alternatives discussed in this document and in the HCP modification document. Plum Creek would exchange approximately 1,900 acres to the Forest Service and the Forest Service would retain approximately 2,700 acres, both in the Kelly Butte area. This is an area just east and adjacent to the subject critical habitat. These lands, currently either federally designated Matrix lands or Plum Creek lands, would comprise a consolidated block which was designated as a special management area in the legislation approving the land exchange. The Fish and Wildlife Forest Service would consider these lands for designation of critical habitat. Under the rule designating murrelet critical habitat units, critical habitat designation will be suspended on lands incorporated into an HCP, which addresses marbled murrelets. In order to incorporate such lands into an HCP, the Fish and Wildlife Forest Service must analyze such action and ensure the action will not result in the adverse modification of critical habitat. That analysis will occur

when the Fish and Wildlife Forest Service initiates its internal consultation process under Section 7 of the ESA.

The likelihood of marbled murrelets using the Planning Area in the near future remains very low (Herter and Hicks 1995b; Hammer Environmental 1998). In fact, based on results of Plum Creek's HCP surveys and protocol surveys for road-access requests completed since the HCP was signed, in conjunction with radar surveys, marbled murrelets have not been detected in the Planning Area. Additionally, lands designated as critical habitat are not all presently habitat. Of the lands considered habitat, there is a range of quality.

In 1994, Plum Creek surveyed 843 acres of potential habitat for road access projects across Federal lands. In 1995, 1,100 acres of habitat were surveyed, including all areas surveyed the previous year and 257 acres of potential habitat on Plum Creek ownership. In 1996, Plum Creek resurveyed the 257 acres of potential habitat surveyed in 1995 for the second year to complete the required HCP protocol. Based on surveys to date in the Planning Area and the current known distribution of the species in Washington, the population estimate for the Planning Area is estimated to be few or none.

3.7.2.3 GRIZZLY BEAR (*URSUS ARCTOS*) (HCP SECTION 2.10.3)

Portions of the North Cascade Mountains and Selkirk Mountains in Washington have been designated as Grizzly Bear Recovery Areas by the FWS. Sightings of grizzly bears and their tracks have been recorded in the north Cascades and may indicate migration of individual bears from populations in southern British Columbia. An evaluation of grizzly bear habitat in the North Cascades cited nine potential sightings of grizzly bears in the Planning Area (Almack et al. 1993). All of the reported sightings between 1974 and 1991 were located in the I-90 Lakes Subunit of the Planning Area within the zone corresponding to the North Cascades Recovery Area. However, it is believed that there are no resident, breeding grizzly bears in the Planning Area. It is hoped that grizzly bears in the North Cascades region are slowly expanding their range and that the trend in population may be increasing. Yet, there have been no confirmed sightings of grizzly bears in or near the Planning Area since the signing of the HCP.

Federal lands within the Recovery Zone will be managed toward the goal of 1 mile of road per section of land as an overall watershed/subwatershed average. Within the SPAMA portion of the Recovery Zone, the goal is 2 miles per section. Within the Recovery Zone there is an interagency agreement for no net loss of core habitat. Core habitat is defined as habitat beyond the 0.3-mile zone of influence from roads or heavily used trails. In the calculation of core habitat, roads, motorized trails, and heavily-used nonmotorized trails are all considered equal in terms of impacts to bears. When assessing the percentage of a Bear Management Unit which is in core habitat, impacts are assessed by season. This means that many high-elevation roads are inaccessible during spring and do not detract from core-habitat calculations. Gated roads are not considered "closed" unless there is documentation of low levels of road use, including all administrative use. The Federal agencies are expected to address other issues such as sanitation, bear-proof dumpsters, information and education, and access to specific habitat types.

3.7.2.4 GRAY WOLF (*CANIS LUPUS*) (HCP SECTION 2.10.4)

Sightings in Washington in the last two decades have led to the conclusion that gray wolves are recolonizing the Cascade Mountains, likely from populations in Canada. Canids have recently been reported to occur in the Planning Area. According to WDFW records, wolf sightings have been reported inside or within 2 miles of the Planning Area in the last 3 years. Based on this information, the population of resident, breeding gray wolves in the Planning Area is currently estimated to be zero; wandering adults are present in the region and the population may be increasing.

3.7.3 SPECIAL EMPHASIS SPECIES (HCP SECTION 2.10.5)

This group includes 17 wildlife species, 1 of which (i.e., Oregon spotted frog) is a Federal candidate species (previously a C1 candidate) and 16 of which are Federal “species of concern candidates). These likely include those species with the highest likelihood of becoming federally listed during the HCP period. Among this group there are five amphibians, four birds, and eight mammals (two carnivore and six bat species)(see HCP Table 1 and DEIS Tables 11 and 12). Three fish species also considered in this category (i.e., steelhead, coho, and chinook) are discussed in FSEIS Section 3.8.

Although Canada lynx are not listed they have been proposed for listing. Plum Creek has requested that the species be added to its ITP concurrent with listing or sooner. Should they become listed in June or July of 1999, the Service anticipates that Canada lynx will be added to Plum Creek’s ITP.

There have been no substantial changes in baseline information for these species with the following exception of the Larch Mountain salamander (*Plethodon larselli*) which is currently a Federal and State-listed sensitive species. Along with the Oregon spotted frog, this salamander is one of the rarest species of amphibians in the Pacific Northwest (Leonard et al. 1993). Until recently, they were thought to be restricted to the vicinity of the lower Columbia River Gorge between the Hood River and Troutdale, Oregon and from the Washougal River to near the Klickitat River, Washington (Nussbaum et al. 1983). However, disjunct populations have been found north of the Gorge in the central Cascade Range of Washington near Mt. St. Helens and just south of Mt. Rainier (Aubry et al. 1987, Leonard et al. 1993). They have been found up to 3,400 feet elevation (Leonard et al. 1993).

Larch Mountain salamanders were reported by a Forest Service biologist further north along the Cascade Crest on shaded talus slopes within the Planning Area. Collections were reportedly made from this site by Forest Service and Central Washington University biologists. This would represent an extension from their previously known range. No records in the Planning Area were noted in the WDFW PHS database, as of August 11, 1994.

Recently, during amphibian surveys at talus slope sites completed in association with the implementation of the HCP, road-access projects, and the land exchange, Larch Mountain salamanders were discovered at seven locations within the Planning Area. Five of these locations were within the Green River subbasin and two were within the Yakima River subbasin. All were associated with rocky substrates. Four of these locations occur on Plum Creek lands, two on National Forest lands, and one occurs on State lands covered by the DNR’s HCP.

3.7.4 ASSOCIATED SPECIES (HCP SECTION 2.10.7)

This group contains the remaining vertebrate species of wildlife that potentially inhabit the Planning Area. The diverse habitat types and conditions in the Planning Area support a variety of wildlife species. A matrix of wildlife species occurrences across the array of forest types, stages of forest stand structural development, and special habitats that occur in the Planning Area was developed (Lundquist and Hicks 1995) for species most likely to occur in the Planning Area. Additional analysis of these and other species was included in the Service's Unlisted Species Assessment (USFWS 1996).

3.7.4.1 LIFEFORMS

The vertebrate species have been grouped into assemblages (or guilds) based on similarities in breeding and feeding habitat preferences. The assemblages are also known as Lifeforms. Lifeforms have been used to group species for analysis in several forest wildlife compendia (Brown 1985, Thomas 1979). A total of 16 Lifeforms (20 groupings when considering divisions made within several Lifeforms) are represented by the vertebrate wildlife and fish species. Fish are contained within Lifeform 1 and are described in FSEIS section 3.8.

Table 16 of the DEIS identifies for each Lifeform, forest structural classes which were assigned as primary or secondary habitat preferences. Primary habitat is defined as a preferred or optimal habitat that predictably supports the highest population density of a species or that habitat upon which a species is essentially dependent for long-term population maintenance (Brown 1985). Secondary habitat is defined as a habitat that is used by a species, but is clearly less suitable than primary habitat, as indicated by a lower population density or less frequent use. A habitat may be designated as secondary where it is known to be used by a species but data are insufficient to clearly identify it as a primary habitat. One measure of success in accommodating species in a given Lifeform is the trend in primary habitat; a second measure is the suitable habitat. The area of suitable habitat was defined for threshold determination as the area of structural stages making up the primary habitat, plus one-half of the area of secondary habitat. This measure was intended to weigh the primary habitat more heavily than the secondary.

A number of adjustments were made to the Lifeforms described in Thomas et al. (1985): (1) Forest stands considered in this analysis for some Lifeforms were limited to those in proximity to other features. For some Lifeforms, the "search area" was restricted to riparian and wetland associated stands, stands surrounding talus and rock, or stands within 0.5 miles of a distinct edge. (2) Several of the Lifeforms were partitioned to distinguish different use patterns of the structural stages among sub-groups of species in the Lifeform. Examples are Lifeform 13 (cavity-excavators) and Lifeform 14 ("secondary" cavity-nesters), which were both separated into two groups depending on whether or not the species required large snags or large cavity-capable trees. As discussed below, some species use a wider variety of structural stages than others as primary habitat. (3) Certain forest stages were deferred from consideration as suitable habitat for some Lifeforms (i.e., Lifeform 13) due to past practices of not leaving as many snags or snag-recruitment trees. These stages will be counted once stands managed according to HCP standards grow into such categories (about 10-20 years). For Lifeform 5, suitable habitat is the amount of habitat within 0.5-miles of an "edge" between forage and cover habitats. For Lifeform 15, suitable habitat is separated into forests in the early, middle, and late-aged conditions.

For Lifeform 4, the analysis focuses on areas surrounding cliffs, talus, and other areas of significant rock. The previous analysis contained in the original HCP and EIS used management units with significant amounts of rock or rocky soil to complete a landscape analysis for forest structural stages in areas adjacent to such talus and rocky areas. Because Forest Service lands involved in the land exchange do not have information available on rocky areas, a new method was developed to assess the entire landscape. This method used an overlay of the DNR soil type map onto the Planning Area. If a stand polygon contained at least 50 percent rock or rubble soil types, the stand was included in the Lifeform 4 analysis. The HCP modification document further describes efforts to develop some biologically meaningful methodology to spatially analyze the forest conditions surrounding meaningful rocky areas. Target amounts of forest structural stages will be adjusted to reflect these changed methodologies within one year of the completed land exchange.

3.8 FISH AND FISH HABITAT

A brief discussion of fish and fish habitat within and surrounding the Planning Area is provided below. An expanded discussion is provided in Section 3.8 of the original EIS, and is incorporated here by reference.

Most of the Planning Area west of the Cascade crest drains into the Green River (Figure 3, DEIS, 1996). Mainstem and most tributary streams were historically accessible to both resident and anadromous fish in the Green River. Currently, no natural spawning by anadromous fish, except for steelhead trucked above the City of Tacoma diversion, occurs upstream of the diversion dam. Juvenile coho salmon, however, are outplanted into tributary streams upstream of the dam. Small portions of the Planning Area drain into the upper Cedar River and the upper South Fork of the Snoqualmie River basins. These two basins are isolated from anadromous fish by waterfalls and contain only resident species or planted juveniles of anadromous species. East of the Cascade crest, the Planning Area drains into the Yakima River Subbasin. Mainstem and most tributary streams in this Subbasin were historically accessible to anadromous fish. Both resident and anadromous species are present in the Yakima Subbasin. The status of resident and anadromous fish in the Planning Area is addressed in the HCP (Sections 2.12 and 2.13).

Fish of primary concern (Special Emphasis Species) in the Planning Area are bull trout (*Salvelinus confluentus*), rainbow/steelhead trout (*Oncorhynchus mykiss*), coho salmon (*Oncorhynchus kisutch*), and spring chinook salmon (*Oncorhynchus ishawytscha*). Other species in the Planning Area include cutthroat trout (*Oncorhynchus clarki*), brook trout (*Salvelinus fontinalis*), lake trout (*Salvelinus namaycush*), brown trout (*Salmo trutta*), kokanee (*Oncorhynchus nerka*), sculpin species, and whitefish. Bull trout are now listed in the Columbia River Distinct Population Segment as are Puget Sound chinook and Mid-Columbia River steelhead. Puget Sound/coastal bull trout are proposed for listing.

Since issuance of the incidental take permit to Plum Creek in June, 1996, the U. S. Fish and Wildlife Service (Service) amended Plum Creek's incidental take permit to add the bull trout to the list of Section 10(a) species. On September 11, 1997, Plum Creek officially requested that the Service add the bull trout to the Company's incidental take permit. On May 4, 1998 the Service published a notice-of-intent to amend Plum Creek's incidental take permit (63 FR 24565). The purpose of the notice was to seek public comment on the Service's proposal to add bull trout to Plum Creek's permit. On May 30, 1998, the Service reinitiated the Biological Opinion on amendment of the Section 10(a)(1)(B) incidental take permit previously issued to Plum Creek, based upon the HCP and Implementation Agreement in accordance with Section 7(a)(2) of the Endangered Species Act of 1973 (16 U.S.C. 1536 et seq.). This document (Fish and

Wildlife July 13, 1998, Biological Opinion) is incorporated by reference. The Service reinitiated the Biological Opinion to address the effects of adding the Columbia River distinct population of bull trout to Plum Creek's incidental take permit. The Service also considered whether or not the proposed action of adding the bull trout to the permit would likely adversely affect the northern spotted owl, marbled murrelet, grizzly bear, gray wolf, and peregrine falcon. The Service concluded that adding the bull trout to Plum Creek's incidental take permit would not adversely affect any of these species. In a letter to Plum Creek dated July 14, 1998, the Service determined that this amendment was appropriate and consistent with the Implementation Agreement signed on June 27, 1996, with regard to the HCP accompanying Plum Creek's incidental take permit, and the Service authorized Plum Creek to add bull trout to the list of Section 10(a) species under its incidental take permit, and to incidentally take bull trout in the course of otherwise lawful forest management and incidental land use activities within the HCP Planning Area.

Plum Creek has requested that the Puget Sound chinook and Mid-Columbia River steelhead be added to their HCP.

Based on DNR's stream classification system, there are approximately ~~317~~³²⁴ miles of Types 1, 2, and 3 streams. For analysis purposes, it was assumed these represent the fish-bearing streams (~~Types 1, 2, and 3 streams~~) within the Planning Area (Table 28A, Modification document). Thus, approximately 10 percent of all streams within the Planning Area are assumed to be fish-bearing streams for analysis purposes. Among the assumed fish-bearing streams, approximately ~~81~~⁸⁶ miles or ~~26~~²⁷ percent of ~~317~~³²⁴ total fish-bearing streams in the Planning Area are located on Plum Creek's ownership.

3.9 SOCIO-ECONOMIC

A brief discussion of the socio-economic circumstances within and surrounding the Planning Area is provided below. An expanded discussion is provided in Section 3.9 of the original EIS, and is incorporated here by reference.

The Planning Area encompasses 418,700 acres (~~169,200~~ 131,200 acres are owned or managed by Plum Creek) spanning parts of the central Cascade Mountain Range located in King and Kittitas Counties. Both King and Kittitas Counties have considerable diversification in their economies. Neither county is heavily dependent on timber and wood products industries for their economic base. In King County, the number of employees working in Lumber and Wood Products industries has constituted roughly 1 percent of the employed workforce for at least the last nine years (DEIS, Table 18). ~~Between 1986 and 1993,~~ In 1997 Kittitas County had approximately ~~200~~ 125 people employed in Lumber and Wood Products industries, representing about ~~2~~ 1.1 percent of the employed workforce. ~~Statewide, between 36,000 and 42,000~~ In 1997, approximately 34,700 people (~~2~~ 1.4 percent of total employment) were employed in establishments classified within the Lumber and Wood Products industrial group (WA Employment Security 1995 January, 1999).

Businesses in the Paper and Allied Products industry are also dependent on timber resources. Establishments within this industry are primarily engaged in the manufacture of paper and paperboard. In 1993, King County had 2,369 people employed in the Paper and Allied Products industry (WA Employment Security 1995). Statistics for Kittitas County do not indicate any employment in this industry.

Plum Creek employs 2,460 people in timber-related industries throughout Washington, Idaho, Montana, Louisiana, Arkansas, and Maine. The Company's business involves harvesting and supplying logs to its processing facilities and to other mills; and manufacturing finished products for primarily retail, industrial, and other specialty markets. Plum Creek owns approximately ~~309,000~~273,000 acres of timberlands in western Washington, approximately 1.6 million acres in northern Idaho and western Montana, 538,000 acres in Louisiana and southern Arkansas, and 908,000 acres in Maine. It owns and operates six sawmills, three plywood plants, one medium-density fiberboard plant, two remanufacturing plants, and five forest nurseries and seed orchards. In 1997, Plum Creek paid-out \$97 million in payroll, paid approximately \$250 million for goods and services to local businesses and contractors responsible for logging, environmental, construction and maintenance work in its forests, and paid approximately \$12 million in State and local taxes. Processing facilities dependent on timber from Plum Creek account for important employment and personal income benefits.

A portion of the expenditures, payroll, etc. discussed above are generated by Plum Creek's activities within the Planning Area. The Company operates two offices that serve the Planning Area. These offices are in Enumclaw and Roslyn and employ 15 and 11 personnel, respectively. A number of mills and other timber-dependent businesses receive logs from the Planning Area. Timber harvested from Plum Creek's land within the Planning Area is hauled by contractors located in Leavenworth, Yakima, Ellensburg, Cle Elum, and North Bend.

3.10 CULTURAL RESOURCES

(This section replaces the applicable section in the DSEIS in its entirety and the redline/strikeout format is not used.)

3.10.1 INTRODUCTION

This Description of the Affected Environment is adapted from several publications which have described this topic previously. These publications include The Muckleshoot Indian Tribe Huckleberry and Plum Creek Land Exchanges Traditional Cultural Places Study Initial Report of Findings (Larson 1999); Muckleshoot Indian Tribe Plum Creek Land Exchange Ethnobotanical Resource Gathering: Places, Practices, & Patterns (Eloheimo 1999); The Yakima Indian Nation Forest Heritage: A History of Forest Management on the Yakima Indian Reservation, Washington (Williams and Babcock 1983); I-90 Land Exchange: Draft Environmental Impact Statement (USDA 1998); Guidelines for Evaluating and Documenting Traditional Cultural Properties (Parker and King 1990); and Environmental Assessment for the proposed Yakima Indian Reservation Forest Management Plan 1993-2002 (BIA and YIN 1993).

This section of the document focuses on cultural resources with particular emphasis on those resources of interest to the Native American Tribes. The general concerns of the Tribes include the effects on treaty-protected fisheries, hunting, and cultural sites and resources. The Planning Area includes the adjudicated usual and accustomed fishing places and open and unclaimed areas that members of the Muckleshoot Indian Tribe and the Yakama Indian Nation actively use for fishing, hunting, and gathering.

Because the manner in which the landscape was used by Native Peoples is interwoven with the places themselves and other ways in which those places were utilized, the descriptions below are written in a manner that incorporates the holistic views of these resources. Tribal members are continually frustrated

with questions about the specific locations of plant and animal resources, but also about the locations of campsites. From their point of view, they used all of the mountains. They lived and camped in different areas and at different elevations at appropriate times in the resource harvest cycle. There are also places, upland base camps in the area where groups annually returned over many generations to harvest plant and animal resources, trade, and socialize. The entire area remains an area of interest to the Native Peoples.

Certain types of cultural resources can be addressed in more detail than others. Some cultural resources may remain unknown because of difficulties locating the resources in areas of steep topography or where the forest undergrowth or duff is thick and may obscure such resources. Tribal members are generally adamant that plant types and associated uses are not shared with the public to protect the plants from over harvest. Additionally, Tribal members will not disclose places that are visited for spiritual reasons to protect their seclusion. Documents generally include only information that Tribal members are comfortable sharing. Thus, plant locations are not precisely delineated, the uses of plants are not discussed, spiritual practices are not detailed, including the locations and/or the ceremonies. Reticence to disclose or discuss precise locations is also a reasonable response to factors such as historical mistreatment of tribal resources by the dominant culture, protection of sites from vandalism and intrusion, and individuals' lack of authorization to disclose group knowledge to outsiders.

3.10.2 DEFINITION

Under the National Historic Preservation Act (NHPA), cultural resources includes archaeological resources, historic properties, objects of antiquity, cultural items embodying traditional/religious values and significance, and traditional/religious values. Historic properties are "any prehistoric or historic district, site, building, structure or object included in, or eligible for inclusion in, the National Register of Historic Places" (16 U.S.C. 470w (5)). More recently, several "cultural landscapes", places particularly rich in historic properties and traditional cultural significance and associations for certain Indian tribes, have been found eligible for listing on the National Register. The criteria used to evaluate the National Register eligibility are as follows:

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

- a) That are associated with events that have made a significant contribution to the broad patterns of our history; or,
- b) That are associated with the lives of persons significant in our past; or,
- c) That embody the distinctive characteristics of a type, period or method of construction, or, that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguished entity whose components may lack individual distinction; or
- d) That have yielded or may be likely to yield information important in prehistory or history.

The 1992 NHPA amendments specify that properties of traditional religious and cultural importance to an Indian Tribe or Native Hawaiian organization (traditional cultural properties) may meet the criteria for listing on the National Register.

Under State Forest Practices Regulations, cultural resources are defined as "archaeological and historic sites and artifacts and traditional religious, ceremonial, and social uses and activities of affected Indian Tribes". Affected Indian Tribe means "any Federally recognized Indian Tribe that requests in writing from the Department [of Natural Resources] information on forest practices applications and notification filed on specific areas".

This report addresses archaeological, historic, traditional places, and other cultural resources in separate sections, recognizing however that there is often significant overlap between definitions of these resources.

3.10.3 IMPORTANCE

American Indians have an ancestral tie to the land within the Cascade Mountain Range. They have and continue to place a high value on isolated and quiet places for purification, meditation, vision-questing, and conducting other traditional practices. Cultural resources are an important part of the American heritage and are often irreplaceable. For instance, archaeological resources are a unique, fragile, and nonrenewable feature of the environment. As such, archeological and historic resources are recognized by a special set of historic preservation laws, regulations, and policies.

Particular importance is placed upon cultural resources by Native American Tribes. Cultural resources are an important part of their lives and heritage. Because Native Peoples were intimately familiar with their surroundings, categorization and naming of their surroundings was elaborate. It is reported that in some cases, the naming of plants and animals possessed greater precision than contemporary taxonomies of western science. Similarly, an elaborate system for naming places was developed. Places also contain and trigger the stories that constitute the oral history of a people, including family heritage information that is sometimes carefully guarded. These are indicators of the general importance of these resources to peoples of the Yakama and Muckleshoot Tribes.

Green River Basin

The areas of special concern to the Muckleshoot Indians include Grass Mountain, Huckleberry Mountain, Kelly Butte, the range east of Kelly Butte to Stampede Pass and Tacoma Pass, south to the White and Greenwater Rivers, and north of the Green River, including Cougar Mountain, Rooster Comb Mountain, and Bald Mountain. The HCP Planning Area was traditionally used by Muckleshoot ancestors for hunting, plant gathering, and spirit questing. Muckleshoot ancestors and contemporary Muckleshoot People traveled to the Planning Area annually to hunt deer, pick huckleberries and wild blackberries, peel cedar, and to collect medicine plants and spring water. The Planning Area is an integrated system of plants and animals, water, and locales visited for subsistence and spiritual sustenance, the use of which is grounded in the historic and inherited traditions of Muckleshoot People. The upper Green River subbasin is associated with cultural practices and beliefs of the Muckleshoot Indian Tribe that are rooted in the community's history and are important to maintaining the continuing cultural identity of the community, and may yield information important to history and/or pre-history. Muckleshoot People were relocated to lands near their winter villages, located at lower elevations, on the present reservation. Muckleshoot ancestors traveled each year to summer camps in the Planning Area. Although they were locked out of their traditional use

areas in the upper Green River watershed for many decades, and could only enter occasionally and illegally to seek food and medicines, contemporary Muckleshoot People have taken advantage of recent access agreements to utilize the resources of the watershed.

The Upper Green River Basin is a place that was historically important to the ancestors of the Muckleshoot Indian Tribe for hunting, picking and preparing berries, trading and visiting with Sahaptin-speaking relatives from Eastern Washington, and for seeking spirit power. One recently excavated important archaeological site in the area demonstrated that Indian people have been using certain locations for thousands of years to dry huckleberries. Open areas on the mountain ridges were maintained by Indian People by controlled burning to manage and improve habitat for game and yields of berries and other plant resources, until the practice was prohibited by the U.S. Forest Service. Historically, Muckleshoot Indian people went to sites such as Mule Spring, Bone Lake, Williams Hole, Kelly Butte, and Twin Camps to pick berries and medicine plants either in the vicinity or on short day trips that were taken from the base camps.

Since the 1940s, Muckleshoot Indian people drive to the mountains for day trips and do not usually stay the night. However, they pursue nearly all the same resources that their ancestors sought. Muckleshoot Indians have adapted non-Indian subsistence patterns in a nominal way, but Muckleshoot People have continued to go to the mountains for deer, cedar, medicine plants, and spiritual renewal out of material and cultural necessity. Wild foods or "Indian foods" are vital to the physical and spiritual health of the people and medicine plants are routinely used by many Muckleshoot People on the reservation. The importance of Indian foods cannot be emphasized strongly enough. Tribal members believe that the reasons for sickness within the Tribe are based on eating non-Indian food. Indian foods are served at all ceremonial occasions and the process of providing deer and fish for these occasions is so important that it has been institutionalized by the Tribe through the Hunting and Fishing Committees.

Spiritually, the landscape was a place for young people to go to seek their power. Not all Muckleshoot Indians seek power in the old ways, although some still do and traditional spiritual practices are enjoying a recent resurgence. The Planning Area's water resources are not considered by some of the Tribal members to be pure enough, but again, others annually go with their families to find a quiet pool to conduct ritualized cleansing for the year. Others routinely go the Planning Area for spiritual renewal and contemplation.

Yakima River Basin

The archaeological record discovered thus far in the Planning Area and adjacent areas of the Eastern Cascades reaches back at least 10,000 years. According to the Yakama Indian Nation, their presence on these lands may predate the Missoula Floods which occurred between 16,000 and 13,000 years ago. Yakama legends speak about these floods and other major environmental events of the distant past, supporting the Yakama belief that they have been resident on these lands since ancient times (Williams and Babcock 1983). Because of the relatively great age of archaeological remains in the area, they present a tremendous resource. From a scientific point of view, these remains span several major climate changes and their associated human adaptations. Thus, they may provide an opportunity to gain a deeper understanding of these processes. Such understanding is important for at least two reasons. First, it contributes to the general knowledge concerning human history on a local, regional, and even global level. Second, it can assist in finding solutions to contemporary problems by using information which indicates how people in the past adapted, survived, and in some cases flourished. From another point of view, one that has nothing to do with science or the goals of science, archaeological remains represent a concrete legacy of the Yakama people. It is a solid and undeniable reminder of their past, of their ancestors, of the roots of their culture, of how they have become to be who they are today (YIN 1993). In a sense, when

these archaeological materials are damaged, destroyed, or removed from where they lie, records of the Yakama people are also being damaged, destroyed, or removed from their resting place. This affects not only those Yakama living now, but those yet unborn.

The culture of the Yakama people is based in the land. Traditional beliefs and practices are rooted in connection with the landscape that the Yakamas have inhabited and continue to inhabit. The Yakamas had permanent and seasonal villages within the Planning Area and hunted, fished, and made seasonal movements across the Planning Area. In many ways, the identity of the land and the people are inseparable. Thus, it is critical that forest-management activities such as timber harvesting preserve cultural resources and that the record of Yakama culture might survive into the future.

3.10.4 DESCRIPTION OF CULTURAL RESOURCE CONCERNS

Each Tribe has identified a number of cultural resources for which they have concerns with respect to the proposed exchange and subsequent modification. In general, they are concerned that wilderness areas, particularly old-growth cedar, might not be preserved for future generations. They are also concerned that access to wilderness areas for hunting; access to pristine areas for ritual and spiritual bathing and vision-questing, and access to flora (including undisturbed stands of red cedar for medicinal and technological uses) might not be provided. They are also concerned that biological resources such as medicinal plants dependant on old forest conditions or special habitat types, and salmonids dependant on healthy riparian and aquatic conditions might be negatively impacted, or that historical, heritage, or archaeological resources on exchange lands acquired by Plum Creek might be negatively impacted by the difference in land-management practices between the relative protection under the Federal ownership and the management of land under Plum Creek ownership.

Each Tribe has active fish-planting and enhancement programs and are striving to restore and rebuild salmonid populations. They are concerned about continued access to planting sites on streams and about potential degradation of stream habitats and salmonid populations. Each Tribe has wildlife management and research programs. They are also concerned about access for other ongoing game management; gathering of medicinal, basketry, fuel, and ceremonial plants; conduct of wildlife research; and cultural purposes.

3.10.4.1 PREHISTORIC AND ETHNOGRAPHIC OVERVIEW

Prehistoric cultures may have resided within the Cascade Mountains over 10,000 years ago. Cultural resources associated with prehistoric cultures include campsites, villages, graves, quarries, pictographs, workshops, trails, rock shelters, and religious sites. The prehistoric period in interior western Washington came to a close during the middle 1800's. Information collected from expeditions during the mid- to late-1800s, along with recollections of Native American elders, and anthropological studies have led to the reconstruction of the way of life of the inland western Washington groups as it was at historic contact. At least three Indian groups have occupied and regularly used the Cascade Range that is a part of the Planning Area: Muckleshoot, Upper Yakama (Kittitas), and Lower Yakama (Yakama) bands.

According to the DEIS for the I-90 land exchange prepared for the U.S. Forest Service (USDA 1998), the prehistory of the Cascade uplands in the vicinity of the land exchange is not well known. Until the past 20 years, archaeology, on the west side of the Cascades centered on the coastline and adjacent lowlands of the

Puget Sound area, while archaeology east of the Cascade Crest was centered along the Columbia River Basin and its tributaries. Heritage-resource investigations have largely consisted of surface investigations done in conjunction with environmental impact assessments in response to hydroelectric-development, timber-harvest, road-construction, or land-exchange projects. These surface investigations have not led to the development of a local prehistoric chronology. Therefore, chronological sequences and phases of human development used to explain the prehistory of the Columbia Plateau have generally been adopted to explain the prehistory of the Cascade uplands.

More recently, surveys, testing, and data-recovery efforts in the Mt. Baker-Snoqualmie, Wenatchee, and Gifford Pinchot National forests, and in the Yakima Training Center east of the Planning Area have contributed to our knowledge of Cascade uplands prehistory. Archaeological evidence in the land-exchange vicinity consists largely of surface findings of lithic scatters and hearth features, probably representing transient camps. Heritage resources that might be discovered in the proposed land-exchange areas would potentially contribute significantly to reconstructing a regional prehistory and history. The prehistoric sequence presented below is summarized from overviews of previous works cited in the DEIS for the I-90 land exchange.

The earliest evidence for human occupation of the Cascade uplands, known at this time, dates to 11,000 years ago; although, according to the land exchange DEIS (USDA 1998), archaeological evidence indicates that from approximately 11,000 to 4,500 years ago, use of the Cascade uplands was marginal. From 11,000 to 8,000 years ago, the climate in the Planning Area was much cooler and wetter than it is presently. The earliest occupants of the area to the east and west of the Planning Area developed a subsistence strategy that was based primarily on large mammal hunting, and made seasonal use of fish, shellfish, plants, and other upland resources. This phase of human development is regionally referred to as the "Windust Phase." According to the U.S. Forest Service (USDA 1998), a single fluted point, attributed to the Windust Phase and large-game hunting culture, was collected at the Cle Elum Lake Dam. Similar points have been found at other locations in the Cascade uplands.

The climate shifted and a period warmer and drier than the present conditions evolved from 8,000 to 4,500 years ago. Human populations east of the Cascades apparently responded to the climatic shift and corresponding changes in the predictability of plant and animal resources by diversifying the subsistence base to include more use of plants, fish, and small game. Sites from this period are clustered along the larger rivers east of the Cascades and show the beginnings of a specialized riverine subsistence adaptation, as well as a more-broadly based economy with increasing use of the uplands over time. This phase of human development is regionally referred to as the "Vantage Phase." Vantage-Phase sites have been found along the shores of Lakes Keechelus and Kachess.

Beginning approximately 4,500 years ago, the climate in the project area reached conditions similar to current conditions. Also beginning around this time, there is evidence of notable growth in the use of the uplands and riverine resources, growth in population and presence of village sites along river courses, and development of food-storage technologies on both sides of the Cascade Crest. A subsistence strategy that involved traveling to seasonally available resources, including seasonal upland plant and animal resources, became increasingly important. Archaeological sites on the east and west flanks of the Cascades that date to approximately 3,000 years ago are similar in type, content, and distribution, indicating that by 3,000 years ago, the beginnings of trade, travel, and marriage between groups had led to some diffusion of cultural patterns. This period of development is known as the "Frenchman Springs Phase."

From the end of the Frenchman Springs Phase, patterns of human settlement evolved resembling those recorded by the first European explorers and ethnographers of the project area. The period from around 3,000 years ago to the time of European contact, the historic or ethnographic period, is known as the "Cayuse Phase." This phase is characterized by occupation of large semi-permanent winter villages, seasonal forays to the uplands and occupation of seasonal camps, fully developed food-processing and storage technologies, and complex trade and travel networks from the Puget Sound coast to the Columbia Plateau.

The USFS DEIS indicated that, although no aboriginal villages have been identified within the proposed exchange lands, at least four Indian groups are known to have traditionally used the territory in the vicinity of the lands proposed for exchange and therefore to have a direct historical interest in these lands: the Muckleshoot, Puyallup, Upper Cowlitz (Taidnapam), and Upper Yakama (Kittitas) Tribes. Of these, only the Muckleshoots and Yakama Tribes made regular use of the HCP Planning Area.

According to the ethnographic literature, the Muckleshoot, Duwamish, and Puyallup spoke languages of the Coastal Salish family, in common with the Lower Cowlitz (Cowlitz); while the Upper Yakama and Upper Cowlitz both spoke Sahaptin languages, in common with the Lower Yakama (Yakama). However, the Yakama have indicated that the Sahaptin language is not representative of the Yakama people because they are of the Columbia Basin language of "itcheeshkenn" or "teentumkee". The evidence indicates that these groups made occasional use of the land in the Planning Area for hunting and gathering. The seasonal subsistence pattern for these groups typically involved moving, in dispersed groups to the uplands in the spring, summer, and fall months, and re-grouping in larger villages in the lower river valleys during the winter.

The Muckleshoot and Yakama Tribes are those having a direct historical connection to the HCP Planning Area. These are the groups considered most likely to have information on traditional cultural uses of the proposed exchange lands and traditional cultural properties on those lands. Figure 3.1 1-1 of the U.S. Forest Service DEIS (USDA 1998) shows the approximate location of treaty ceded lands in the vicinity of the land exchange and is herein incorporated by reference. In addition to the Indian groups discussed in this document, the following groups were also signatory to treaties that included the proposed I-90 land exchange area and were identified as having, a possible historical or continuing interest in the study area: the Squaxin Island, Nooksack, Lummi, Samish, Upper Skagit, Sauk-Suiattle, Swinomish, Stillaguamish, Tulalip, Snoqualmie, Nisqually, Suquamish, and Confederated Tribes of the Colville Reservation. However, according to sources cited in the USFS DEIS, no ethnohistoric or ethnographic source has been found indicating that these groups traditionally used the HCP Planning Area. While it is possible that these and other Indian groups may also have a historical connection to these lands, no evidence of this was made available to the ethnographic study team for the I-90 land exchange.

The Muckleshoot Tribe of Indians was formed of three Bands: the Smal-ka-mish of the upper White River, the St-ka-mish of the main White River, and the Skope-ah-mish of the Nooscoope or Green River. The present tribal composition also includes people of Duwamish and Upper Puyallup descent (Larson 1998). According to the U.S. Forest Service (USDA 1998), there is no recorded evidence of Muckleshoot villages, settlements, or hunting camps on the exchange lands. However, it is clear from the record that Muckleshoot People utilized the Planning Area on a regular basis. Muckleshoot had hunting camps in the Green River watershed. Muckleshoot villages have been documented as far upstream as Burns and Newaukum Creeks. Downriver of these spots, a large fishing camp at Kanasket has been attributed to ancestors of the Muckleshoot. The Muckleshoot also stored canoes at Kanasket and trekked upstream to

deer-hunting and berry-picking grounds in the Lester area and along the Huckleberry Divide Trail. Huckleberry and Grass Mountains were intensively used huckleberry (also includes blueberry) (Vaccinium spp.) grounds.

The Kittitas (Upper Yakama) had permanent villages along the reaches of the Upper Yakima River from just south of Cle Elum to just south of Ellensburg. Summer villages were located at the mouths of Kachess and Cle Elum Lakes and also at the head of Cle Elum Lake. None of the recorded settlements are on the exchange lands.

A large fish weir located at the south end of Lake Cle Elum (also outside the exchange lands) was probably constructed by the Upper Yakama, who also used the trail along the east edge of the lake to access huckleberry grounds and fishing locations further upstream. The Yakama also hunted in the mountains west of Lake Keechelus and made seasonal use of the Manastash/Taneum and Bald Mountain areas to the east and southeast. According to the U.S. Forest Service (USDA 1998), no evidence of permanent Yakama settlement has been found in these areas. Proposed exchange parcels along the Cascade Crest are located near ethnographically documented trade and travel routes through Snoqualmie Pass and Naches Pass, both of which linked Indian groups on east and west sides of the Cascades.

A large camas-gathering ground near the city of Kittitas, well outside the proposed exchange lands, was an important locale where Yakama and other Indian groups gathered annually for various communal activities after the spring chinook runs. Camas was one of several wild roots abundantly available and widely used as a staple food by aboriginal peoples in this area. Limited evidence provided in U.S. Forest Service archaeological reports, and one local history of the area indicates Canteen Flats/Rocky Prairie was a Yakama root-gathering ground. This locale is just south of Bald Mountain. Huckleberry-gathering grounds were located along the Teanaway and Cle Elum rivers.

The social organization of Indian groups in the project area prior to the arrival of Euroamericans may actually have been considerably more-complex and fluid than may be indicated by present-day tribal designations. While some of the recognized Tribes in the area are similar to their aboriginal composition, others are confederations of Bands and Tribes created in the mid-19th century in conjunction with the making of treaties with the U.S. Government, or in the 20th century for Government administration. Ethnographic and ethnohistoric records of aboriginal social organization indicate that Indian groups in the project areas came together at certain times of the year to exploit specific types of resources or participate in social and ceremonial gatherings, and then dispersed. Exogamy, marriage outside of the kinship group, was practiced throughout the Planning Area. Exogamy and bilineal descent (descent reckoned through the mother and father of each generation) served to create a complex social network with kin ties beyond the village, and to facilitate trade and travel.

The most basic social unit of the Coast Salish groups (including the Muckleshoot, Puyallup, and Duwamish) was the family, which stayed together during seasonal migrations to resource-procurement areas. Families came together to form households, households could form a local group, and local groups could form a winter village. The winter residence was the most stable social unit. The fundamental unit of Yakama society was the Band, and the largest social-political grouping was the village or multi-village Band. Like Salish families, Bands moved together through a yearly subsistence cycle. A single Band or village controlled a valley or a portion of a valley along a lateral stream of the Yakima River. The Yakama established and protected their territorial-use rights over fishing, root-digging, and berry- and

plant-gathering grounds, but these resources were shared with friendly groups if the resource would support additional use (USDA 1998).

3.10.4.2 CULTURAL RESOURCES DESCRIPTION

Cultural resources are varied and complex. They vary from foods such as salmon, camas, and venison to locations such as fishing and hunting camps, or even spiritual sites. Yet, all those examples have an intangible aspect, one that cannot be seen directly. Even though some cultural resources are intangible, such resources should be fully considered in planning and decision-making by Federal agencies. Historic properties represent only some aspects of culture, and many other aspects, not necessarily reflected in properties as such, may be of vital importance in maintaining the integrity of a social group. However, the National Register is not the appropriate vehicle for recognizing cultural values that are purely intangible, nor is there legal authority to address them under section 106 unless they are somehow related to a historic property (Parker and King 1990). Historic properties, resources for which the NHPA applies, are covered later in this Section.

Many aspects of significance (whether such values are tangible) have not been explored or are poorly understood as a result of translation difficulties, cultural perception, or lack of trust. Cultural resources of importance to Indian people are in the main, quite concrete places and things, that may indeed be invested with some intangible aspects. However, myths, oral histories (the stories of “what happened here”), even important viewsheds may not always be considered “intangibles”. Perhaps intangible values and significance are in part concepts that are simply difficult to translate into English. People working on behalf of cultural resources are concerned that the “intangible” designation is being misused where not enough culturally sensitive research has been done or trust established to warrant disclosure of information, in order to find no mitigation measures apply to protect certain areas or resources.

Salmon, camas, and venison are traditionally respected and served at feasts. These feasts are very important to many Yakamas. They give thanks to the Creator. Places also may be endowed with spiritual undertones or overtones. Fishing and hunting camps may have legends, memories, ancestors and contemporary uses attached to them. What is unseen may well be as important as what is seen.

Foods and medicines have long been an integral part of Yakima culture. They have been gathered and used for many thousands of years. Even today, such traditional plants play a significant role in the lives of many Yakama people. Foods and medicines serve a wide variety of utilitarian and religious purposes. Elders often state their preference for "Indian food", and these forest products hold high positions of honor at traditional feasts; this indicates the continuing value of plant resources to member's of the Yakima Indian Nation.

Shifting Mosaic

It is now well established that active management by use of fire by Native People, including Muckleshoot and Yakama people, created the landscape that first anglo settlers found in the Northwest, on the west side of the Cascades, both the open prairies and the uplands berry grounds. Periodic burning increased grazing for horses and forage for game and production of food and preferred characteristics of technical plants, such as berries and beargrass.

Climatic changes, and changes wrought by human activity, have affected the abundance of foods and medicines, and other resources, "since time immemorial". Until approximately one hundred years ago, and continuing at a significantly lower level today, fire had a profound impact on the availability of plant resources. It can lower stocking levels within stands, reduce tree-encroachment upon meadows, create openings, alter soil chemistry, and revitalize an area's vegetative productivity. However, since fires have been actively suppressed, the nature of the forest has changed. Stocking levels are frequently higher now than they were in the past. For instance, the once dominant park-like stands of ponderosa pine are being replaced by dense forests of Douglas-fir and grand-fir. Likewise, meadow encroachment is more common now than it was in the past. Openings are starting to close, and it is relatively rare that a fire is able to refresh the vegetative productivity of the soil.

Forests are dynamic. Changes have always occurred, and they continue to occur. The archaeological record speaks of several major climatic periods. Each is characterized by certain temperature ranges, vegetative types, and animal species. Some climatic periods were hotter and drier than today. The forest of today is different from the past and it is probable that it will change in the future. Generally speaking, however, forest conditions appear to have been relatively stable for the last 2,000 to 3,000 years. Even within these conditions the forest has experienced change. Fire has undoubtedly been one of the principal factor's east of the crest. Travelers' accounts of the Eastern Cascades during the 1800's mention tremendous forest fires. And Yakama tradition speaks of fires lit at the end of huckleberry-picking activities which were left to burn until rain or snow doused them. Fires helped lower stand densities and reduce understory vegetation. In the ponderosa stands in particular, elders over 50 years old remember and speak of open park-like pine forests.

Subsistence Harvest

Hunting was conducted in conjunction with the huckleberry camping trips, for subsistence outside of huckleberry-picking trips, and continues to be an important component of Native American life. For instance, the Muckleshoot Indian Tribe hunting leader decided when it was time to go hunting in the mountains, and who would go.

Historically and today, deer meat is used for subsistence and is canned, frozen, smoked, or dried. Muckleshoot People use the deer skins for drums as their ancestors before them. Because deer is a traditional food, it is required for ceremonial reasons like memorial dinners, funeral feasts or other culturally mandated affairs. The Muckleshoot Indian Tribe Hunting Committee has a roster of hunters who are assigned to keep the meat lockers full for ceremonial dinners or who are sent out specifically to hunt for a cultural event. Many of these hunters go to the mountains to hunt. Being a designated hunter is an honor and has not only evolved as a way to take care of the old or the "hardship" cases but is representative of the old roles in a Muckleshoot village such as fishermen, gatherers, among others. The Yakama Indian Nation, through their Fish and Wildlife and Law and Order Committee also establish guidelines for hunting, such as seasonal and area specific restrictions. The State and the Tribes are co-managers of the game animal resource in ceded areas on open and unclaimed lands.

Hunters go to the landscape primarily for deer and elk. Bear and cougar are taken incidentally, as are grouse which are highly sought. Ruffed and blue grouse are especially available in August and September in berry patches. Black bear were also sought as a game animal. Bear grease was very popular for use as a cooking oil and to pour over meat or salmon that was being canned.

Hunters hunt alone or with friends and family members. In this way the younger hunters learn the hunting areas from the older hunters, although hunters certainly go their own way, hiking through the mountains and forests, and finding areas where they can pursue success. Some areas have names within the Tribe that are associated with a hunting incident and have special meaning.

Hunters used a system of trails across the area to hunt deer, elk, and, on Kelly Butte, mountain goats. Today, Native People are either prevented from full access to the trails because of gates and a checkerboard ownership, or because portions of trails are eliminated by past logging practices. The trails were used as part of hunting strategies when hunters drove the animal onto the trail and into the path of other hunters.

Native American hunters generally pray for a good hunt before they leave and during the hunt as they follow the trails in the mountains. But, they also take the opportunity to conduct their spiritual practices. Meat is divided equally between the hunters who have participated in the hunt and the first deer or elk of the season is generally given away, usually to someone in need.

Like anyone who goes to the mountains, the hunters look for medicine plants, firewood, or yellow cedar for carving plaques. In the same spirit of hunting for those unable to hunt, some hunters also watch for medicine plants for elders who need a certain medicine plant but are unable to get it themselves.

Gathering

Native People gathered berries, roots, mushrooms, and a host of other plants used for medicine, basketry, food, or flowers like trillium required for community dinners. Other than the berry picking expeditions, going to the mountains to collect plants was and is undertaken by smaller groups.

Muckleshoot Indian people have traditionally and still today gather plant material in various locations across the Planning Area. Some plants are gathered from locations which are traditional, favored, and visited repeatedly. Some plants, once gathered from locations which may have changed their botanical, ecological, or access characteristics for a variety of reasons including commercial timber harvest, are now gathered from different locations. Additionally, some plants are gathered while travelling from location to location for various purposes. In sum, gathering practices rely upon access to areas of reasonable size and adequate abundance and richness of habitats. Under current conditions, the Planning area contains such areas. Areas suitable for gathering should be considered likely past gathering locations unless specific evidence argues against it. It is not appropriate to only consider site-specific harvest sites as that does not reflect the actual practices that define the strong cultural relationship between the Native Peoples and the environment. Generally, forage plants that may be of concern, or may have been managed in the past for culturally significant wildlife species, are generally not considered in cultural resource assessments.

The trips into the mountains are opportunities for elders to teach younger people the locations, uses, and proper preparation of plants. These trips are also opportunities for elders who left the reservation or for other reasons were not taught traditional ways, to be trained in this aspect of Muckleshoot culture. As elders become too old to go the mountains, they send younger people to collect what they need. Or, the younger people supply the elders with what they need from their own collections.

Food Plants. Berries have traditionally been one of the most important subsistence resources and huckleberries, blackberries, strawberries, salmonberries, thimbleberries, and red elderberries are still eagerly sought. Elders typically gather mushrooms on the elder field trips as well as new fern shoots (fiddleheads) and salmonberry sprouts. The 1998 huckleberry season west of the Cascade Crest was essentially non-existent which apparently happened historically, too. Berry pickers gathered as many berries as possible when berries were available and preserved them to last until the following year's crop or availability of other food resources. Wild blackberries are harder to find and are generally completely picked if a good patch is encountered. The berries were popular with Yakamas who traded roots for blackberries. Blackberries are used for special occasions, to serve to visitors or for Tribal dinners.

Berry pickers followed the berries as they ripen, beginning in August, and then went up toward the summit and picked berries where they ripen later, in September. Huckleberries, salmonberries, thimbleberries, blackberries, red elderberries, Oregon grape were all preserved by drying before canning became popular and before refrigeration. Berries were sun dried. The Native Peoples spread them out on buckskin and rolled them. They sometimes built fires to hasten the drying when it was cold. Huckleberries and wild blackberries were dried on racks and always gathered up into containers at night. They were brought out into the sun the next day, so three or four days were sometimes required to completely dry the berries.

In the 1930s and 1940s, people stopped drying berries and began canning them. Also about this time, the large huckleberry picking encampments ceased. Berries are also important for Tribal dinners and ceremonies like funerals, memorials, the First Fish Dinner and Last Fish Dinner. Most Muckleshoot Tribal members follow the tradition of eating fruit with meals. The berries were covered with swordferns laced to the edge of the basket with rawhide thongs and/or with noble fir boughs and swordferns.

Technical Plants. Traditionally, Muckleshoot People collected cattails, beargrass, cedar bark, cedar root, ironwood, yew, and vine maple for basket and tool making, and devil's club for making canes. Elders have been collecting cedar bark in the area for the last decade, continuation of an old practice. Cedar bark is collected in April and May, before the pitch starts running too much. Cedar trees need to be between 10-12 inches in diameter to 25-30 inches in diameter because the bark is still pliable and easier to peel. The bark of older trees is too tough and hard to peel and too hard to work for the basket weavers. The cedar bark is used for making headbands and baskets or for spiritual reasons. As with the hunters when they bring home a deer, thanks are given to the cedar tree for giving its bark. Beargrass was traditionally collected throughout the meadow that once stretched between Mule Camp and Kelly Butte but Tribal members complain that for some reason the beargrass in the landscape is too short and not wide enough to use for basket making. Cedar trees were also used to make canoes.

Medicine Plants. Tribal members are quite reticent to identify medicine plants or to discuss their uses. One reason is fairly simple. The experience of those collecting is that when this information is shared with outsiders that the plants are not managed in the same way that Tribal members manage the plants. For example, certain plants are harvested only at certain times of year or only parts of a plant are collected to encourage the plant to continue growing. Also, plants such as cedar can only be peeled once so the tree can survive. Tribal members rotate among gathering places to ensure that plants in one place are not too heavily used that they will not return. Others, though, suggest that the taboo against sharing information about medicine plants has a deeper cultural tradition. Like other resources in the mountains, the higher in the mountains that a resource was found, the more value ascribed to it by the Native Peoples.

Medicine plants are found in a variety of places. And there are medicines that can be used or are only available once a year. Some medicine plants cannot always be assured of occurring in the same place. Medicine plants were and are still collected to prevent and/or cure a variety of ailments. Others are taken as precautionary measures, to increase the appetite, to prevent childbirth pain, to encourage healing, and ensure fertility, and to put in their medicine bags to drive away evil spirits. Different parts of a medicine plant may be used -- roots, leaves, flowers, or the whole plant. Teas are almost always made from the medicine plants, preferably with spring water. Some plants are mashed for poultices and others mixed with bear grease.

Tribal members generally look for medicine plants while hunting, berrying, peeling cedar, or walking on the trails. As when hunting, the gatherers often prepare themselves with prayers before going and thank the Creator after they have finished. In some cases, the existing record provides little or no information pertaining to the locations of gathering, especially with regard to medicinal plants. It would clearly not be reasonable to conclude that plants used medicinally were not gathered at all simply because the information detailing the gathering practice is scarce. As culturally sensitive plants have not been as thoroughly analyzed as wildlife species have been for the Planning Area by landowners or agencies, the forthcoming Traditional Cultural Properties study conducted by the Muckleshoot Indian Tribe for the upper Green River basin provides unique and especially valuable information.

Spring Water. Native Peoples often traveled long distances in search of spring water. Especially if they were sick and they wanted a certain spring water from a certain spring. They had runners that went and got the water, even if it was late at night, for those who were sick. Spring water is traditionally used to make medicine teas, regular drinking tea, and for washing hair and drinking. While travelling for other reasons, Native Peoples looked for spring water. The plant-collecting expeditions are also opportunities to collect spring water. When people go to the mountains, they frequently bring back spring water for preparation of the medicine plants and to make tea for guests, or just for drinking. The mountain water is considered to have special properties and to be more pure than the lowland water by Tribal members.

3.10.4.3 TRADITIONAL PLACES

Both the Muckleshoot and Yakama Tribes believe that cultural resources occur all across the landscape. Important traditional use areas exist across the Planning Area and include all types of cultural places. Hunting and fishing camps, camas-collecting areas, spiritual-use sites, and more are considered important sites. Many of these have been damaged or destroyed through past practices, making the places that remain undisturbed of even greater value to Tribal members.

Important cultural sites include huckleberry fields, root grounds, woodlands, meadows, old growth, higher-elevation habitats, and riparian zones. Many of these important areas would be included in areas receiving special attention as unique or sensitive habitats under the Northwest Forest Plan and Plum Creek's Cascades HCP. Also central to Indian culture are the physical places of traditional and contemporary use. These places are characterized not only by tangible remains of past inhabitants, but by vegetation such as huckleberry fields, open Ponderosa pine stands, and places of religious importance. The forest exerted considerable influence upon Native People. The forest offers a myriad of resources important to past, contemporary, and future generations of Native Peoples. Vegetative, animal, aquatic, mineral, and spiritual resources abound, which if treated with integrity and sustainability provide a major portion of cultural life. The forest, as a result of climatic, topographical, geologic, and anthropomorphic

factors, is marked by a diverse spatial array of resources. The combination of this variety of resources with a complex history of processes such as fire, disease, grazing, and infestation enhances the diversity of the forest temporally and spatially.

Specific Places

The Upper Green River Basin has a unique spiritual and symbolic value to Muckleshoot Tribal people because of the role of Grass and Huckleberry Mountains, and Kelly Butte in traditional Muckleshoot culture. The Huckleberry Divide Trail and the associated historic campsites at Mule Spring, and Bone Lake, Twin Camps, and Williams Hole, kindle fond memories for Muckleshoot People who recall a highly anticipated summer occurrence that promised hard work, exciting social exchanges, and reunions with relatives and friends Muckleshoot People remember renewed trade and cultural exchanges with the Yakama people with their fine horses, spirited intertribal horse racing, challenging mountain goat hunts, and spiritual renewal. Muckleshoot People also traditionally sought power in the mountains above the Green and White Rivers. Current practices are private, but some members of the Muckleshoot Indian Tribe continue to conduct spiritual activities in the mountains.

The Muckleshoot Indians, continued to travel to Grass and Huckleberry Mountains to hunt deer, for annual huckleberry picking trips, to collect plants for medicine and baskets, and for spirit quests and spiritual contemplation. The annual huckleberry trips are the best documented in the historic record because they presented a colorful picture of Muckleshoot Indians on horseback and in wagons traveling through Enumclaw to the Greenwater Camp at the base of the Bone Lake Trail and to the Slippery Creek Camp at the base of the Slippery Creek Trail. From these camps, people hiked up the trails, some with horses to large summer encampments at Mule Camp and Bone Lake where berries were dried and/or canned for storage and trade. Others continued along the Grass Mountain/Huckleberry Divide Trail to Kelly Butte, Twin Camps or wherever the huckleberries were abundant that season. Nearly every elder has stories about this important part of the food-gathering cycle. The huckleberries on Huckleberry Mountain were so important to Muckleshoot People that as early as 1915, they petitioned the Forest Supervisor to request protection of the huckleberries in the Snoqualmie Forest Reserve. The trips continued until the late 1930s and 1940s when increased ownership of the mountains by the U.S. Forest Service and logging companies prevented Tribal members from access to many traditional resources.

Places along the Divide, like Bone Lake, Mule Springs, and Kelly Butte are singled out because they have been studied due to more recent Federal projects requiring NHPA investigations. Although these places are of great importance, others are as important, though they went into private ownership before there were legal requirements or resources in the Tribe to demand research or protection. For instance, the Grass Mountain land exchange occurred in the early 1980's which was prior to the 1992 NHPA amendment. Historic use of this area, especially by the Green River people, was as intense as in the White River Basin. Access has been restricted for a few generations in the Green River Basin, and archaeological research is just beginning. Important campsites are now being recorded, for instance, at Howard Hanson Dam by the Army Corps of Engineers; and Stampede Pass, especially the area near Lizard Lake, is a present day huckleberry-use area.

In spite of diminishing resources and a pre-1992 prohibition against trespassing on Tacoma Watershed lands and those of private logging companies, Muckleshoot People would still seek out the resources and spiritual respite of the area. Hunters traveled to the areas on Huckleberry Mountain and Kelly Butte that have not been completely logged off, in the fall, and travel in organized groups, with their families, or alone

to collect cedar bark and medicine plants. In 1992, the Muckleshoot Indian Tribe entered into an agreement with the Tacoma Watershed to allow Tribal members into the Watershed to access plants, including cedar, beargrass, and medicine plants.

Spiritual cleansing and/or bathing requires uncontaminated water. The purest and the cleanest water is at the headwaters of streams. The colder the water, the stronger the power. Springs, pools, and waterfalls are also places of spiritual power and renewal. Contemporary Tribal members go to the mountains to specific places as an annual spiritual cleansing. Others hike through or drive to the Mountains for private contemplation and spiritual refreshment. Contemporary Muckleshoot Tribal members give thanks to the mountain or the Creator for the resources that are given. Traditional Muckleshoot Indian religion was based on the acquisition of spirit power. Muckleshoot ancestors and Muckleshoot Indian people went to higher elevations to seek such power, to fast, to bathe in the spring water, and prepare for feasts. Spiritual practices are very private and although spirit questing is not conducted in the same way it was, Muckleshoot Tribal members visit the area for spiritual bathing and spiritual renewal.

Many facets of historic and prehistoric use of the Planning Area are similar between the Muckleshoot and Yakama peoples. One distinction among contemporary Tribal members is that the bond between the Muckleshoot and the upper Green River is similar to the bond that the Yakama people have toward the Yakama Indian Nation Reservation and its forests. This does not decrease the significance of the Planning Area for members of the Yakama Indian Nation.

The Traditional Cultural Places Report (Larsen 1999) describes the locations, importance, and detailed usage of a number of sites such as Mule Camp and Bone Lake Camp. It describes gathering, movements with changes of abundance, water availability, game harvest, camp songs and games, sweats, and fishing, and how all these activities were interrelated with the characteristics of the places they were conducted. The report also discussed the maintenance of many areas by burning and how many of the huckleberry fields were historically larger than they are today as a result of those actions. The descriptions of those areas and how they were used is incorporated by reference.

Movement

In the Naches Basin, foragers were closely aligned with the resource gradients showing a tendency to move up in elevation in summer and down in elevation in winter (Williams and Babcock 1983). Base camps or winter villages are known for lands below 3,000 feet in elevation. Work camps, or places where resources were processed for immediate consumption, storage, and trade are located throughout the elevational gradient of the eastern Cascades. Work camps can be broadly classed as collecting, hunting, trapping, fishing, and special resource camps. Camps often moved as resources became more or less abundant in those and other places. Some seasonal work camps were used thousands of years ago and are still in use by Yakama Indians (Williams and Babcock 1983). Interaction camps are places where people gathered for social, economic, and spiritual reasons. They involved large groupings of people and in many cases utilized abundant resources such as salmon, huckleberry, or camas. They also include places of spiritual importance to individuals and families such as burials, or vision quest places.

The Skopabsh, Smulkamish, and Stkamish, also known as the Green and White River Indians (as well as their descendants -- the Muckleshoot Indians) "traveled back and forth above the river beds in the country paralleling the Cascade Range." The Skopabsh, Smulkamish, and Stkamish people ranged east of their villages up the Green and White Rivers throughout the mountains to Naches Pass. From Naches Pass, they

traveled to eastern Washington to trade with Yakama or Kittitas people for items not available on the west side of the mountains. The mountains were part of an annual subsistence cycle where people went to hunt; gather food, medicine, and technical plants; trade with Indians from east of the mountains; and to undertake spiritual activities, such as spirit quests. Lower-elevation areas were likewise very important.

The variety of trails and travel routes documented by the ethnographic literature in the project vicinity, including the transmontane Yakama-Cowlitz, Snoqualmie Pass, and Naches Pass trails, attest to the mobility of the Indians. Some transmontane trails that were used by Indian groups were later adopted by the Euroamericans as foot paths, wagon roads, stock driveways, and railroad routes, and are now recorded as such. Some of the most important trails are mentioned above. According to the U.S. Forest Service (USDA 1998), no evidence was found that any of these trails run through the proposed exchange parcels.

Euroamericans introduced the horse to the Yakama in the late 1700s, profoundly altering the economic and social organization of these groups by facilitating travel and trade over much greater distances. Indian groups on both sides of the Cascades traded actively with one another and with the Hudson's Bay Company at Fort Nisqually, further to the west on south Puget Sound.

The trails throughout the area are an important web that provides access to hunting, berrying, and plant gathering. The archaeological association of sites to the trails has not been intensively explored, but the use of the trails has been so intense and the trails represent a land use that is so ancient that it is likely that unknown archaeological sites are associated with the trails. Contests such as horse racing at a "racetrack" in a meadow near Bone Lake were accompanied by bone games. The trails that circled the top of the Huckleberry Divide Trail ridge were also used as a racetrack.

The trails may have also been associated with water suggesting that the trails were built not only to accommodate the topographical contours but to take advantage of water sources. Specific trails are discussed in the Traditional Cultural Places Report (Larsen 1999). Other trails are unnamed and difficult to identify because parts or all of them have been obliterated by logging or other human activities.

The ethnographic record suggests that Indian people have followed patterns of movement throughout the landscape for a variety of reasons such as hunting, fishing, traveling for trade, traveling to specific higher-elevation berry-picking sites, etc. These purposes were regularly combined as, for example, in seasonal excursions which often lasted several weeks as people followed ripening rates up to and over mountain passes.

The ethnographic and contemporary record indicates patterns of movement from lower elevation villages and towns into higher elevation habitats at various times during the year as well as between various locations in the mountains.. In historical times, this ability to move required trails, and to a large extent it still does. There is ample evidence in the Planning Area of active foot trails. When the record indicates seasonal travel into the mountains, it is through trails that this would have been carried out. Plants are encountered along trails while they are being traveled. Common sense suggests that desirable plant species will be collected whenever they are encountered, even if collection is not the explicit purpose of the journey. Field observations suggest that travel routes typically flow along logical topographic pathways.

3.10.4.4 ARCHAEOLOGICAL RESOURCES

Archaeological resources have been adversely affected by previous timber harvesting and grazing activities. Poor road and skid-trail placement, large-scale ground disturbance by heavy machinery, improper culvert installation, spring development, overgrazing, and untended livestock have all adversely affected the resource. Due to such activities, the archaeological/historical record of the region is likely nowhere near as intact as it was fifty or one hundred years ago.

According to the Traditional Cultural Places Report (Larsen 1999), some archaeological sites within the area have been determined eligible for listing in the National Register of Historic Places. However, it is likely that archaeological sites may also be associated with known campsites such as Twin Camps and Kelly Butte and in unknown campsites associated with the web of trails that criss-cross the landscape. Heritage resources located by the Forest Service, primarily during recent surveys associated with the I-90 Exchange, were limited due to lack of investigation of Traditional Cultural Places, which was finally undertaken by the Muckleshoot Indian Tribe within the Planning Area.

In general, the Forest Service reports (USDA 1998) that the Wenatchee National Forest has a greater density and variety of prehistoric and historic resources. The Forest Service believes this may be attributed in part to better visibility and gentler topography on the east side of the Cascades, the availability of an attractive suite of plants and animals, and the availability of cryptocrystalline silicate, the fine-grained, glassy rock that was preferred prehistorically for making stone tools. The greatest overall density of heritage resources is in the Manastash/Taneum and Bald Mountain area. The abundance of recorded archaeological sites on the East side is also partly attributable to the size and activity of the Yakama Nation's cultural resources department, which employs its own professional archaeologist and crews to investigate on and off-reservation sites. Yakama does not have to rely on Federal project surveys to locate and document resources.

The most-common types of heritage resources found on the east side of the Cascades are prehistoric lithic scatters and isolates, historic trash scatters and isolates, historic mining sites, and rock alignments. Prehistoric stone tools are scarce. Most lithic scatters and isolates are unused stone flakes and waste from stone-tool manufacturing and reshaping. Rock alignments include talus pits (circular depressions located on a talus slope or at the toe of a talus slope, and ranging in size from 6.5 to 20 feet in diameter and 1.5 to 5 feet in depth) and rock cairns (piles of stones, generally found on mountain slopes and peaks, varying in height from less than a fraction of a foot to about 4 feet). Both resource types (pits and cairns) are clearly intentionally formed by humans. Uses of talus pits are variably interpreted as burial sites, food caches, and/or hunting blinds, depending upon their size, form, and associated artifacts. Cairns may also be interpreted variably as spirit-questing locations, burials, or trail or resource markers. Some of these features may have served multiple purposes over time.

The majority of heritage resources in the Manastash/Taneum area are from the historic era, while resources in the Bald Mountain area are generally prehistoric associations and resources of an unknown age and association. A large number of mining resources (adits, prospects, cabins, trash scatters) and carved aspens (also of historic origin) were found in the Manastash/Taneum area. Heritage resources related to stock herding and grazing (shepherders cabins, corrals, fences, stock driveways) were also found in these areas.

Heritage resources found on the western flank of the Cascades within Planning Area are primarily historic period resources including historic trail segments (some with blazed trees), with lesser amounts of historic resources related to logging (logging camps, roads, and railroad grades). Prehistoric resources include a boulder shelter site, a tested subsurface lithic scatter, and an isolated stone flake.

Plum Creek lands included in the exchange were not field surveyed for this project. There has been very little survey work on these land in the past; therefore, little can be said about the potential for surface or subsurface heritage resources. Nevertheless, information for these lands is presented here as additional background on the affected environment.

Available documentation for the Plum Creek exchange lands includes records of 17 heritage resources: 7 within the Cascade Crest parcel group, 9 within the I-90 North group, and 1 in the Pine Creek/Cedar Flats area. It is important to reiterate that, due to the paucity of survey data for the Plum Creek lands, the numbers and types of heritage resources documented to date is not a good representation of what an exhaustive pedestrian survey of these lands would encounter. The 17 documented heritage resources include 6 lithic scatters (5 in the Cascade Crest area), the historic Stampede Tunnel, a World War II air defense station and test site, a portion of the U.S. Forest Service's Snoqualmie Pass Water System (including a dam across Coal Creek, a storage tank "house," and water-conveyance pipes constructed in 1935), a hand-cleared wagon road, and 4 sites related to the Cle Elum Mining District or other mining operations.

Most of the documented heritage resources referred to above have yet to be evaluated for National Register eligibility. None of the resources recorded on the Plum Creek lands is listed on the National Register or has been found to meet the criteria for listing. Adolph Elsner Cabin (within the Cle Elum Mining District), and the U.S. Forest Service's Salmon la Sac Campground, both on National Forest land within 1,000 feet of the Plum Creek lands, were found to meet the criteria for listing on the National Register. Given that only a small portion of the proposed Plum Creek exchange lands have been surveyed for historic properties, and given the density of heritage resources documented on the National Forest System exchange lands east of the Cascade Crest, it is reasonable to assume that many more resources remain unrecorded on unsurveyed portions of the Plum Creek parcels.

The Final EIS on the I-90 Land Exchange (USDA 1999) contains a description of archeological and heritage resources found on lands proposed to be exchanged to Plum Creek. None of the listed or eligible properties remain in the current exchange within the HCP Planning Area.

3.10.4.5 HISTORIC PROPERTIES

History (Euroamerican Period)

The history of the Planning Area includes transportation, logging, mining, and other resource extraction activities. The earliest recorded presence of Euroamericans in the project areas was by trappers and fur traders, followed by explorers searching for a transportation route between Puget Sound and the coast and the Columbia Plateau.

The members of the U.S. exploring expedition led by Lieutenant Charles Wilkes were the first Euroamericans to record discovering Naches Pass and the Naches Pass Trail in 1841. The Hudson's Bay Company had probably also used this route after 1833, when Fort Nisqually was established. Washington

Governor Isaac Stevens commissioned a party, led by George McClellan, to find this route. McClellan failed on several tries, but Abel Tinkham, sent out by McClellan with his own party, was successful at finding Yakima Pass. J.H.H. van Bokkelen found Snoqualmie Pass, with the help of Snoqualmie Indian Chief Pat Kanim, while searching for fort locations in 1856. Many of these routes were already well-known by Native Peoples who traveled and traded throughout the area.

The anglo settlement of the western Territories began consequent to the Donation Land Act of 1850 which provided Federal lands for homesteading. In 1854, the railroad surveys were authorized marking the beginning of a period of accelerated exploration of the Cascades. The Naches Pass Trail, a treacherous wagon road, was used by James Longmire (another early explorer) and his party in 1853, but was little used between 1853 and 1887. In 1887, it was abandoned completely following the Northern Pacific Railroad's successful tunnel through Stampede Pass to complete its transcontinental railroad. The railroad was routed up the Yakima River Valley, through Stampede Pass, to Tacoma. Construction of the Northern Pacific Railroad brought many workers to the area, including a large contingent of Chinese laborers, and dramatically affected the development and natural history of the area. The railroad opened the new state of Washington for trade to the east, opened the Cascades for logging, and attracted European and Asians to work on the railroads and in the local logging and milling, industries concentrated on the west side of the Cascades and in the upper Kittitas Valley.

Plum Creek's ownership in the Planning Area is generally of a "checkerboard" configuration and is bordered mainly by lands administered by the Forest Service. Plum Creek's ownership and the "checkerboard" land configuration have their origin in the 1864 land grant legislation established by Congress. At that time, the Federal government recognized the importance of improving access to new land and began deeding Federally owned lands to States and the private sector to encourage the construction of canals, highways, and railroads. Under the land grant legislation, the Northern Pacific Railroad Company Inc. was authorized to construct a railroad line from Lake Superior to Puget Sound. For every mile of track constructed, the law provided 400-foot right-of-way and alternate sections of land (10 square miles on each side of the right-of-way in Minnesota and Oregon, and 20 square miles on each side in the territories in between) deeded to the railroad upon completion of each 25 miles of railroad. In 1989, Plum creek purchased the land from Burlington Resources, the Company that ultimately acquired the land from Northern Pacific's successor, Burlington Northern.

A rush for gold at Peshastin and Swauk Creeks occurred in the 1870s, and in the early 1880s, the Peshastin, Swauk, and Cle Elum Mining Districts were formed on what is now the Wenatchee National Forest. The Cle Elum Mining District, along the eastern shore of Cle Elum Lake, is outside of the National Forest System proposed exchange parcels, but a portion of the mining district includes the Plum Creek exchange parcels. Gold was also found on the Yakima River north of Manastash Ford. The Cle Elum Mining District turned out to be more productive for coal than gold. Large coal fields were discovered south of the district in 1884 and the company town of Roslyn was founded around these fields. At the peak of mining in the upper Cle Elum watershed at the turn of the century, over 1,000 people lived and worked in the valley above what is now Lake Cle Elum. Coal was also discovered on the Carbon River within the Mt. Baker-Snoqualmie National Forest in 1862, and the Northern Pacific Railroad built a branch rail line to this area. Coal production began to decline after 1915, but persisted in the Roslyn/Ronald area into the 1960s.

There was a boom in homesteading on the east side of the Cascades following passage of the Homestead Act in 1862. The arrival of the Northern Pacific railroad in 1888 opened the Cascades further to activities

of mining, logging, and water-resource development. Cultural resources associated with this past way of life include historic cabins, trails, mines, ditches, railroad grades, emigrant trails, original highway grades, mills, and homesteads. Between the end of the nineteenth century and the early twentieth century, nearly 500 homestead entries were filed on land now within the Wenatchee National Forest. No new homesteads were filed between 1897, when the Forest Reserve Act was passed, and 1906, when the forest was once again opened for homesteading. These early homesteaders were primarily sheep and cattle ranchers.

The Cascades also have a rich history associated with the administration of the forest beginning in 1891 with the General Land Law Revision Act. Historic forest Service structures include guard stations, lookout towers, corrals, camps, administrative centers, and Depression-era campgrounds and buildings.

Population and agricultural expansion in the Kittitas and Yakima valleys put pressures on the ranchers to take their livestock up into the mountains for summer grazing. Stock driveways were established along the major ridgelines and other easily traveled routes. The Huckleberry Divide Trail, on the west side of the Cascades and on the divide between the Green and White rivers, was an important sheep driveway.

Irrigation systems were developed around the turn of the twentieth century on the east side of the Cascades to feed the orchards and wheat farms in the Kittitas, Yakima, and Naches valleys. Irrigation ditches can still be found within the forest, and one irrigation ditch has been located on a proposed National Forest System exchange parcel. The damming of Keechelus, Kachess, and Cle Elum lakes began in 1910 and was completed by 1933.

The Euroamericans also brought a number of diseases to which the Indians had no resistance. Arrival of Euroamericans in the project area significantly disrupted the health, social organization, and culture of the Indians that occupied and used these areas. Settler encroachment on traditional tribal territories within the area created hostilities that peaked in the mid-1850s. The Medicine Creek Treaty was ratified in 1855 and the Point Elliott and Yakima treaties were ratified in 1859. Hostilities between the Indian groups and settlers continued beyond the signing of treaties, however. Governor Isaac Stevens appointed Chief Seattle to represent component groups of the present-day Muckleshoot Tribe and other Bands of the Duwamish watershed at the Point Elliott Treaty conference. The Puyallup were represented at the Medicine Creek Treaty conference. At the signing of the Yakima Treaty, the Yakama were a loose aggregation of 14 somewhat diverse Bands, represented by Kamiakin. These 14 Bands formed the Consolidated Tribes and Bands of the Yakama Indian Nation. In 1994, they officially adopted the spelling of "Yakama" rather than "Yakima," correcting a long-standing misspelling.

The Pacific Forest Reserve was created in 1893 and the U.S. Forest Service was created in 1897. Land management within the Planning Area was largely dictated by the Federal policies of the USDI (before 1905) and the USDA (after 1905). The early work of the U.S. Forest Service in the Planning Area was largely related to grazing regulations, fire control, and timber sales. The evidence of fire-control efforts can be found in numerous U.S. Forest Service trails, lookouts, and communication lines on both Mt. Baker-Snoqualmie and Wenatchee National Forests, some of which occur within the Planning Area. It is also evident in the altered character of forest stands and the enhanced susceptibility to insects, disease, and catastrophic fire.

The City of Tacoma entered into a cooperative agreement with the Federal Government in 1914 to protect and conserve the Green River watershed, the City's main water source. The City began actively purchasing and condemning property in the watershed in the early 1960s, and a difficult period of conflicting local and

Federal land- and resource-management policies followed, which has only recently neared resolution. In 1992, the Muckleshoot Indian Tribe entered into an agreement with the Tacoma Watershed to allow Tribal members into the Watershed to access plants, including cedar, beargrass, and medicine plants.

Historic Properties

The Planning Area has several properties/districts listed in the National Register of Historic Places. Historic resources include: Lester Depot, Salmon La Sac Guard Station, Cabin Creek Historic District, and Roslyn Historic District. In addition, Archaeological Site 45-KI-54 in the Mt. Baker-Snoqualmie National Forest has been determined eligible for the National Register.

Archaeologists completed heritage resource surveys and limited testing of properties as applicable, on the proposed National Forest exchange parcels between July and November 1997. Archival or background research was undertaken prior to field surveys to learn about property types that may be expected; historic and prehistoric land-use patterns important for understanding the potential for the occurrence of heritage resources; and any previously known or recorded properties. Background research included a search of records at the Washington State Office of Archaeology and Historic Preservation (OAHP) and at U.S. Forest Service district offices, to determine if previous surveys within the Plum Creek and National Forest exchange parcels indicated findings of historic properties.

The Final EIS on the I-90 Land Exchange (USDA 1999) contains a description of historic properties and heritage resources found on lands to be exchanged to Plum Creek. None of the lands to be acquired by Plum Creek within the HCP Planning Area contain historic properties.

3.10.5 EXISTING PROTECTIVE MEASURES

3.10.5.1 FEDERAL LAWS

Over the past 33 years, Federal laws have been enacted which regulate land-use activities associated with Federal project and monies. These Federal laws include the National Historical Preservation Act of 1966, the National Environmental Policy Act of 1969, Executive Order 11593, the American Indian Religious Freedom Act of 1978, and the National Historical Preservation Act Amendments of 1980 and 1992, and the Archaeological Resources Protection Act.

For all Federal lands, the American Indian Religious Freedom Act (AIRFA) of 1978, Public Law 95-431, establishes as United States policy, the protection and preservation of American Indians' "freedom to believe, express, and exercise the traditional religions...including but not limited to access to sites, use, and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites" (42 USC 1996).

The National Historic Preservation Act (NHPA) of 1966 established the Federal Government's policy and programs on historic preservation, including the establishment of the National Register of Historic Places (National Register). Heritage resources are districts, sites, buildings, structures, and objects that contain evidence of past human activities. Heritage resources that are listed or eligible for listing, on the National Register are called historic properties. Historic properties can reflect many kinds of significance, including architecture, history, archaeology, engineering, and culture. Traditional cultural properties are one kind of

historic property reflecting cultural significance. Section 106 of the NHPA requires Federal agencies to take into account the effects of their undertakings on all historic properties. The Washington State Office of Archaeology and Historic Preservation (OAHP, Office of the Washington State Historic Preservation Officer [(SHPO)]; and the Advisory Council on Historic Preservation (ACHP) are the State and Federal agencies responsible for overseeing the management and protection of heritage resources in compliance with the NHPA. In carrying out its responsibilities under Section 106, a Federal agency is required to consult with any Indian Tribe that attaches religious and cultural significance to these properties (16 USC 470a(d)(6)(A) and (B)). 36 CFR Part 800 also establishes special measures for consultation with Indian Tribes regarding potential impacts to historic properties.

The U.S. Forest Service evaluated the potential effects on heritage resources and reserved treaty rights and privileges, based on background information available from resource investigations conducted in the vicinity of the land exchange. Information specific to the proposed National Forest System exchange parcels was gathered using records searches, a heritage-resource field survey, an ethnographic study, and limited archaeological site testing and historic research to provide a contextual framework within which documented heritage resources can be evaluated. In addition, information was gathered through Government-to-Government consultation with 16 federally recognized Indian Tribes, through contact with two Indian groups that have not been federally recognized, and through consultation with the OAHP and ACHP.

At the time the DEIS on the I-90 land exchange (USDA 1998) was released for public comment, the formal National Register evaluation process for heritage resources discovered during the 1997 surveys in the project area was not complete. However, archaeologists conducting the surveys, testing, and gathering information on the context of these resources have made recommendations regarding the applicability of the National Register eligibility criteria. These recommendations do not necessarily represent the views of the U.S. Forest Service or other entities involved with or interested in these processes. The U.S. Forest Service will complete its review of the available data and will independently evaluate and consult with the SHPO regarding the eligibility status of properties on the exchange lands. Results will be included in the Final EIS.

Any identified adverse effects to these properties would be addressed by seeking ways to avoid or reduce the effects (e.g., by eliminating some parcels or portions of parcels from the land exchange or through mitigation).

3.10.5.2 STATE LAWS

State regulations (WAC 222-20-100) specifies that the Department of Natural Resources shall provide the Office of Archeology and Historic Preservation (OAHP) with copies of all applications and notifications for forest practices to be conducted on lands known to contain historic or archaeological resources identified by OAHP. WAC 222-20-120 provides the Department of Natural Resources shall notify affected Indian Tribes of all applications of concern to such Tribes, including those involving cultural resources, identified by the Tribes. Where an application involves cultural resources the landowner shall meet with the affected Tribe(s) with the objective of agreeing on a plan for protecting the archaeological or cultural value. The Department of Natural Resources may condition the application in accordance with the plan. Affected Indian Tribes shall determine whether plans for protection of cultural resources will be forwarded to the OAHP.

State regulations also provide protection for cultural resources under the State Environmental Policy Act (SEPA), which may result in additional environmental analysis and conditioning where forest practices adversely affect cultural properties listed on the Washington Heritage Register or Indian graves, cairns, and glyptic records (WAC 222-16-050(1)(g)).

3.10.5.3 TRIBAL REGULATIONS AND PROGRAMS

The Muckleshoot Indian Tribe Hunting Committee makes decisions regarding Tribal hunting seasons. The Yakama Fish and Wildlife Committee also makes decisions regarding hunting. In both cases, the Tribes are co-managers of the hunting resource with the State on open and unclaimed ceded lands.

The Muckleshoot and Yakama Tribes have been granted consulting party status for the proposed exchange by the ACHP (36 CFR 800.1, 800.5). According to the U.S. Forest Service (USDA 1998), other groups may also obtain consulting-party status. All consulting parties would be participants in the process used to search for ways to avoid or reduce any identified adverse effects on historic properties [36 CFR 800.5(e)(1)]. The results of these efforts will be described in the Final EIS (USDA 1999) and are herein incorporated by reference.

3.10.6 PLUM CREEK VOLUNTARY ACTIONS

3.10.6.1 RELATIONSHIP OF PLUM CREEK AND YAKAMA INDIAN NATION

In conjunction with the Yakama Indian Nation, other state and Federal agencies and environmental groups, Plum Creek developed a model to predict areas of high, medium, and low probability for past human activity. The model provides a tool for land managers by highlighting areas likely to contain archaeological sites. Riparian areas are identified in the model as being areas of high probability of past human use. Plum Creek and the Yakama Indian Nation have agreed that prior to road construction or timber-harvest activities, cultural resource surveys will be conducted on high-probability sites. If appropriate, mitigation measures will be agreed to prior to any activity.

3.10.6.2 RELATIONSHIP OF PLUM CREEK AND MUCKLESHOOT INDIAN TRIBE

Plum Creek and the Muckleshoot Indian Tribe have entered into discussions with regard to a number of topics involving cultural resources. These discussions are still in progress. The Services are hopeful that significant progress will continue with regard to issues surrounding access and cultural resources.

Plum Creek and the Muckleshoot Tribe are discussing cooperative actions, such as refinement of a predictive model for high probability areas for archaeology and other types of cultural sites on the west side of the Cascades. They are also discussing a variety of ways in which access along existing trails can be protected and concern for spiritual sites and plant resources can be addressed. They are working together to provide access and supply of needed resources within Plum Creek's management goals. These discussions are not a part of the Services' implementation of the Endangered Species Act. However, the Services applaud these efforts and encourage their continuation.

3.11 RECREATION

A brief discussion of recreational activities and opportunities within and surrounding the Planning Area is provided below. An expanded discussion is provided in Section 3.11 of the original EIS, and is incorporated here by reference.

The Planning Area encompasses the central Cascades Mountain Range, which is easily accessible for recreational use by residents within the Seattle metropolitan area (1 to 2 hours away) and from communities located in eastern Washington. Recreation use on the Mt. Baker-Snoqualmie and Wenatchee National Forests was about ~~10~~ **11.8** million Recreation Visitor Days (RVDs) in ~~1988~~ **1998**. The recreation activities receiving the most RVDs included alpine skiing, developed camping, hiking, walking, dispersed camping, hunting, and auto travel (viewing scenery) (USDA 1990).

Plum Creek lands are an intricate part of the recreational resource within the central Cascades Mountain Range. Because Plum Creek's ownership in the Planning Area is generally of the "checkerboard" configuration and consists of 169,200 acres of alternating sections bordered mainly by National Forest lands, many of the trails and roads used by recreationists traverse Plum Creek land. In addition, many recreation sites such as campgrounds are located adjacent to land managed by Plum Creek.

3.12 VISUAL RESOURCES

A brief discussion of visual resources within and surrounding the Planning Area is provided below. An expanded discussion is provided in Section 3.12 of the original EIS and is incorporated here by reference.

The visual quality of the central Cascade Range is important to individuals that view the surrounding landscapes by motorized vehicle or by other means such as cross-country skiing, hiking and other recreational activities. A landscape moderately or heavily altered by humans can be perceived by some individuals to have a low visual quality. Human modifications that contrast with the patterns of the natural landscape include roads, rock pits, utility corridors, ski areas, and harvested areas.

The current visual patterns seen from I-90 reflect past timber practices by Plum Creek (and the preceding land managers), the Forest Service, and other owners. State Forest Practice Rules and Regulations governing private and State lands, implementation of the NWFP on Federal lands, and Plum Creek's HCP and Environmental Principles have changed harvest practices in the HCP Planning Area, and as a result, visual impacts will diminish in the future.

3.13 TRUST RESPONSIBILITY AND TREATY RIGHTS

(This section replaces the applicable section in the DSEIS in its entirety and the redline/strikeout format is not used.)

National Forest lands proposed for exchange were ceded to the U.S. Government under treaties signed with Indian groups in the mid-1850s. Indian groups that ceded aboriginal lands through treaties signed with the U.S. Government have "reserved rights." Federal courts have recognized the fact that the signing of treaties primarily took rights away from American Indians; therefore, where treaty language is ambiguous, the courts have tended to rule in favor of Indians. "Reserved rights" were existing rights reserved by the Tribes for the future use and benefit of tribal members. Reserved rights, which include both treaty rights explicitly retained by the Tribes, such as the right to fish at "usual and accustomed grounds and stations," and rights not explicitly taken away in the treaties, may only be taken away by a specific act of Congress. Federal agencies must conduct Government-to-Government consultation with Indian groups when a project has the potential to impact the exercise of their treaty reserved rights.

The Treaty of Point Elliott and Treaty of Medicine Creek each contain the following identical descriptions of off-reservation treaty reserved rights:

Article 5. The right of taking fish at usual and accustomed grounds and stations is further secured to said Indians in common with all citizens of the Territory, and of erecting temporary houses for the purpose of curing, together with the privilege of hunting and gathering roots and berries on open and unclaimed lands. Provided, however, that [sic] they shall not take shellfish from any beds staked or cultivated by citizens.

Federally recognized groups with treaty-reserved rights under the terms of the Treaty of Point Elliott and Treaty of Medicine Creek include, among other Tribes, the Muckleshoot Indian Tribe. The Yakima Treaty contains a very similar description of off-reservation treaty reserved rights, with the addition of grazing privileges for cattle and horses on open and unclaimed land:

Article 3. The exclusive right of taking fish in all the streams, where running through or bordering said reservation, is further secured to said confederated Tribes and Bands of Indians, as also the right of taking fish at all usual and accustomed places, in common with the citizens of the Territory, and of erecting temporary houses for curing them, together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land.

The federally recognized Groups with treaty-reserved rights under the terms of the Yakima Treaty are the Confederated Tribes and Bands of the Yakama Indian Nation.

The right to the taking of fish within "usual and accustomed grounds and stations," which includes both federally and privately owned lands, has been affirmed in numerous court cases. For example, a 1904 Federal court decision established that Indians could not be prohibited from using their usual fishing sites on public or private lands (*United States v. Winans*, 198 U.S. 371-384 [1905]), and a landmark 1974 decision by Judge George Boldt of the U.S. District Court for the Western District of Washington, upheld by the Supreme Court, interpreted the taking of fish "in common with all citizens of the territory" to consist of a right to the opportunity to take up to 50 percent of all commercially harvested fish after escapement goals are met (*Washington v. Washington State Commercial Passenger Fishing Association*, 443 U.S. 658 [1979]).

At the time that treaties were being made in the Pacific Northwest, the privilege of hunting and gathering roots and berries on "open and unclaimed land" applied to unappropriated lands of the United States. Federal courts have ruled that National Forest System lands reserved for the public domain are "open and unclaimed land" unless the lands have been dedicated to a use inconsistent with treaty rights. According to the Forest Service (USDA 1998), previous court cases have set a precedent that treaty privileges on open and unclaimed land debase (do not transfer) with lands transferred out of public ownership to private ownership. The Muckleshoot Indian Tribe has made clear its differing view that treaty privileges on open and unclaimed lands do transfer along with the transfer of the lands out of public ownership, where land uses are not inconsistent with exercise of treaty rights.

The concept of a Federal trust responsibility comes from early Supreme Court decisions that sought to interpret Indian treaties and to determine the relationship between Indian Tribes, Indian property rights, and the Federal Government. These early cases determined that Indian Tribes occupy a unique position as "domestic dependent nations," that is, sovereign entities with authority to prohibit state intrusions but with a "guardian-ward" relationship with the Federal Government. Through the making of treaties, Indian Tribes gave up land in exchange for promises from the Federal Government. The Tribes trusted the Federal Government to fulfill its promises, and the Government thereby incurred a duty to protect the best interests of the Tribes. As a land and resource manager, the U.S. Forest Service has a trust responsibility to honor treaty rights and to make land-management decisions and take actions that do not harm or abrogate treaty rights. The U.S. Forest Service must do this while still meeting its resource-management responsibilities to all the Nation's people. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service have similar Trust responsibility as we conduct actions which may impact Trust resources.

The Services fulfill their Federal trust responsibility to Indian Tribes through compliance with all applicable Federal laws. In keeping with that responsibility, the U.S. Forest Service has initiated Government-to-Government consultation with federally recognized Tribes that are signatories to the Treaty of Point Elliott, the Treaty of Medicine Creek, and the Yakima Treaty. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service have also contacted and met with representatives of the Tribes with regard to our action of modifying the HCP.

Chapter 4 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

The sections in this chapter contain comparative analyses of the consequences associated with each component of the affected environment discussed in Chapter 3. Consequently, sections 4.2 through 4.12 of this chapter correspond directly to sections 3.2 through 3.12 in Chapter 3. Each section contains a discussion of the environmental consequences by alternative. Also included in each section is a comparison of the anticipated consequences associated with each of the two action alternatives (Alternatives 2 and 3), to the baseline effects associated with the No Action Alternative (Alternative 1). For the purposes of this discussion the terms “effects” and “impacts” will be considered synonymous with consequences, and consequences may be positive or negative. Table 2 summarizes comparisons of analytical criteria in most of the sections for all the alternatives. Certain sections have separate tables.

The final section in this chapter, Section 4.14, Cumulative Impacts, considers the incremental impact of each of the alternatives on the environment when added to past, present, and reasonably foreseeable actions regardless of what agency (Federal or nonfederal) or person undertakes such actions (40 CFR 1508.7).

Plum Creek’s HCP Planning Area is comprised of lands on both the east and west sides of the Cascade Mountain crest along the I-90 corridor in central Washington, between 60 to 100 miles east of Seattle. The Planning Area boundary encompasses approximately 418,700 acres of intermingled Plum Creek, Forest Service, and other (i.e., State and private) ownership. Lands in the HCP Planning Area include portions of King and Kittitas Counties. Federal lands within the HCP Planning Area occur within the boundaries of the Wenatchee and Mt. Baker-Snoqualmie National Forests.

4.2 LAND USE AND LAND OWNERSHIP

This section discusses the direct and indirect land-use impacts that would result from the alternatives, consistency of the alternatives with county land-use plans, impact on ownership patterns, and effects on Roadless Areas.

4.2.1 ALTERNATIVE 1 (NO ACTION)

Under the No Action Alternative, there would be no land exchange and Plum Creek would continue to manage its lands in the HCP Planning Area for the primary purpose of growing and harvesting commercial timber. These lands would be managed in accordance with the Company’s properly implemented HCP (Section 3.0; HCP), Corporate Standard Management Practices (Section 1.2.3; HCP), Environmental Principles (Appendix 2; HCP), the Washington State Forest Practices Rules and Regulations, and all other local, State, and Federal laws and regulations governing the management of forest lands. Plum Creek’s lands within the HCP Planning Area have been designated, by King and Kittitas Counties, for commercial forestry use. Therefore, Plum Creek’s activities in the Planning Area under the No Action Alternative would be consistent with land use plans in both Counties.

Table 2. Comparison by Analytical Criteria by Alternative

Table 2. Comparison by Analytical Criteria by Alternative

<u>Analytical Criteria</u>	<u>Alternative 1 (No Action)</u>	<u>Alternative 2 (Partial HCP)</u>	<u>Alternative 3 (Proposed Action)</u>
4.2 Land Use and Land Ownership			
Land ownership within the Planning Area			
• Size of Planning Area	418,700	418,700	418,700
• Plum Creek	170,600	131,200	131,200
• Acres covered by the HCP	(170,600)	(121,000)	(131,200)
• Acres not covered by the HCP	(0)	(10,200)	(0)
• Forest Service	196,200	235,600	235,600
• Other Ownership	45,300	45,300	45,300
Land use within the Planning Area – Plum Creek			
• Acres interspersed with NWFP designated AMA	67,100	36,400	36,400
• Management of Plum Creek lands in AMA	HCP	HCP/State Regulations	HCP
• Acres -interspersed with NWFP designated Matrix	33,500	37,900	37,900
• Management of Plum Creek lands in Matrix	HCP	HCP/State Regulations	HCP
• Acres interspersed with NWFP designated LSR	40,000	32,100	32,100
• Management within NWFP designated LSR	HCP	HCP/State Regulations	HCP
Management of Riparian Areas			
• Federal lands	ACS	ACS	ACS
• Plum Creek's lands	HCP	HCP/State Regulations	HCP
Road Construction			
• Federal lands	NWFP	NWFP	NWFP
• Plum Creek's lands	HCP	HCP/State Regulations	HCP

Table 2. Comparison by Analytical Criteria by Alternative

<u>Analytical Criteria</u>	<u>Alternative 1 (No Action)</u>	<u>Alternative 2 (Partial HCP)</u>	<u>Alternative 3 (Proposed Action)</u>
4.3 Land Form and Geology	RHAs, BMPs, Watershed Analysis accelerated with customized prescriptions for erosion and mass-wasting; HCP road building and maintenance standards; decreased sediment production, reduced sediment delivery to streams	State regulations on acquired lands; watershed analysis applies; some negative impact from lesser protections on acquired lands; large amount of land transferred to NWFP yields benefits but benefits do not occur in Green River	Same as no-action Alternative except large amount of land transferred to NWFP yields benefits but benefits do not occur in Green River
• Slope Stability Effects	Low impact; identified during watershed analysis	Moderate impact; identified during watershed analysis; State BMPs	Low impact; identified during watershed analysis
• Surface Erosion Effects	Low impact; identified during watershed analysis	Moderate impact; identified during watershed analysis; State BMPs	Low impact; identified during watershed analysis
4.4 Air Quality			
• Prescribed Burning / Smoke	No adverse effects; DNR's Smoke Management Plan; prescribed burns no longer standard practice	Same as No-Action	Same as No-Action
• Fugitive Dust from Roads	Minimize road construction and use; meet DNR's standards for dust control	Same as No-Action except fewer roads constructed	Same as No-Action except fewer roads constructed
4.5 Water Quality and Quantity			
• Road Density	High impact	Moderate impact	Low impact

Table 2. Comparison by Analytical Criteria by Alternative

<u>Analytical Criteria</u>	<u>Alternative 1 (No Action)</u>	<u>Alternative 2 (Partial HCP)</u>	<u>Alternative 3 (Proposed Action)</u>
<ul style="list-style-type: none"> Sediment Delivery from Roads Surface Erosion Mass Wasting Increased Flood Flows RHA Impacts 	<p>Moderate impact</p> <p>Moderate impact</p> <p>Low impact</p> <p>Low impact</p> <p>Low impact</p>	<p>Moderate impact</p> <p>Moderate impact</p> <p>Moderate impact</p> <p>Moderate impact</p> <p>Moderate impact</p>	<p>Low impact</p> <p>Low impact</p> <p>Low impact</p> <p>Low impact</p> <p>Low impact</p>
4.6 Vegetation	<p>Harvest deferrals; HCP Riparian Management ; special habitat protection; talus areas buffered; serpentine soil activities will be minimal; enhanced wetland protection; State compliance with weed control</p>	<p>Same as No-Action except no protection of talus or forested wetlands and reduced protection on non-forested wetlands and riparian zones on acquired lands; more land under NWFP; minimal change in forest structural stages</p>	<p>Same as No-Action including special area protection, except more land under NWFP; minimal change in forest structural changes</p>
4.7 Wildlife			
<ul style="list-style-type: none"> Spotted Owl Habitat 	<p>Overall slight improvement in total owl habitat; Year 2045 - 53% in Planning Area, 47% in Green River Basin; effective patch sizes</p>	<p>Minimal differences - 40% at year 2045 in Green River Basin; larger patch sizes but less "stepping stones" in Green River Basin</p>	<p>Minimal differences - 40% at year 2045 in Green River Basin; larger patch sizes</p>
<ul style="list-style-type: none"> Spotted Owl Numbers 	<p>Minimal impacts - 86 pairs at year 2045</p>	<p>Minimal impacts - 86 pairs at year 2045</p>	<p>Minimal impacts - 89 pairs at year 2045</p>
<ul style="list-style-type: none"> Murrelets 	<p>Federal habitat retained and managed for murrelet benefit should re-establishment occur in Green River Basin</p>	<p>Acquired habitat surveyed per State Regulations; some reduction of edge effects</p>	<p>Acquired habitat surveyed per HCP modification; some reduction of edge effects</p>

Table 2. Comparison by Analytical Criteria by Alternative

<u>Analytical Criteria</u>	<u>Alternative 1 (No Action)</u>	<u>Alternative 2 (Partial HCP)</u>	<u>Alternative 3 (Proposed Action)</u>
<ul style="list-style-type: none"> Grizzly Bears 	<p>HCP BMPs; reduction in early-seral forest foraging habitat; reduction in road densities</p>	<p>Acquired lands per State regulations; Plum Creek manages small amount in Recovery Zone; further reductions in road densities and early-seral forest foraging areas</p>	<p>Acquired lands per HCP BMPs; Plum Creek manages small amount in Recovery Zone; further reductions in road densities and early-seral forest foraging areas</p>
<ul style="list-style-type: none"> Gray Wolves 	<p>HCP BMPs; den site protection per HCP; prioritized road closures; reductions in ungulate habitat</p>	<p>Fewer Plum Creek lands in Grizzly Recovery Zone and in Taneum; reduced roads; decrease in ungulate habitat in several areas</p>	<p>Fewer Plum Creek lands in Grizzly Recovery Zone and in Taneum; reduced roads; decrease in ungulate habitat in several areas</p>
<ul style="list-style-type: none"> Larch Mountain Salamander 	<p>Four of seven sites on Plum Creek; protection of talus slopes</p>	<p>Three of seven sites on Plum Creek; one acquired site and potential acquired unknown sites would not receive talus buffers or restrictions on roading and mining; severe impact to rare species</p>	<p>Three of seven sites on Plum Creek; all lands receive HCP conservation measures</p>
<ul style="list-style-type: none"> Goshawk 	<p>Six deferrals; 81 percent in habitat at year 2045</p>	<p>One deferral; no timing restriction on acquired lands; 83 percent habitat in year 2045; potential for larger blocks of habitat in some areas</p>	<p>One deferral; timing restrictions continue per HCP; 83 percent habitat in year 2045; potential for larger blocks of habitat in some areas</p>
<ul style="list-style-type: none"> Bald Eagle 	<p>Single nest site on Federal land with HCP lands nearby; HCP protects through bald eagle plan; roost and foraging protection; HCP Riparian Management</p>	<p>Federal land surrounds single nest site; Plum Creek less habitat along major lakes and rivers; acquired lands offer less protection to winter foraging; State Regulations protect roost sites, and more impact to salmonids</p>	<p>Federal land surrounds single nest site; Plum Creek less habitat along major lakes and rivers; acquired lands offer protection to roosting and foraging eagles, and salmonids</p>

Table 2. Comparison by Analytical Criteria by Alternative

<u>Analytical Criteria</u>	<u>Alternative 1 (No Action)</u>	<u>Alternative 2 (Partial HCP)</u>	<u>Alternative 3 (Proposed Action)</u>
<ul style="list-style-type: none"> Other Species 	<p>Maintains Stand Structural Stages, effective patch sizes; snags left per HCP provisions, special habitats protected such as wetlands and talus; HCP Riparian Management, aquatics benefit from Water Quality</p>	<p>Minimal differences in Stand Structural Stages, potential larger patches; less rigorous snag retention on acquired lands; lack of protection for talus and forested wetlands, less protection for other wetlands and riparian habitats; some impacts to aquatic habitats on or below acquired lands</p>	<p>Minimal differences in Stand structural Stages, potential larger patches; HCP snag retention on acquired lands; HCP protection for talus and forested wetlands, enhanced protection for other wetlands, riparian habitats, and downstream aquatic habitats</p>
4.8 Fish and Fish Habitat	<p>HCP Riparian Management, minimized delivery of sediment to streams</p>	<p>State regulations on acquired lands; more stream miles under NWFP, but slight decrease in stream miles under NWFP in Green River Basin; known bull trout areas under Federal Management</p>	<p>Same as No-Action on acquired lands; more stream miles under NWFP, but slight decrease in stream miles under NWFP in Green River Basin; known bull trout areas under Federal Management</p>
<ul style="list-style-type: none"> Resident Fish Anadromous Fish Flow Effects Sediment Effects Water Temperature Effects 	<p>Low impact Low impact Low impact Low impact Low impact</p>	<p>Moderate impact Moderate impact Low impact Moderate impact Moderate impact</p>	<p>Low impact Low impact Low impact Low impact Low impact</p>
4.9 Economics and Social Environment	<p>HCP provides predictable income for King and Kittitas County communities - 51,300 acres in King County and 118,600 acres in Kittitas County</p>	<p>Slight increase in King County revenues, substantial decrease in Kittitas County revenues - 52,100 acres in King County and 79,000 acres in Kittitas County; some uncertainty on acquired lands</p>	<p>Slight increase in King County revenues, substantial decrease in Kittitas County revenues - 52,100 acres in King County and 79,000 acres in Kittitas County; greater certainty on acquired lands</p>
<ul style="list-style-type: none"> Number of lumber & wood products industry employees in King & Kittitas Counties 	<p>Low impact</p>	<p>Moderate impact</p>	<p>Moderate impact</p>

Table 2. Comparison by Analytical Criteria by Alternative

<u>Analytical Criteria</u>	<u>Alternative 1 (No Action)</u>	<u>Alternative 2 (Partial HCP)</u>	<u>Alternative 3 (Proposed Action)</u>
<ul style="list-style-type: none"> Number of paper & allied products industry employees in King & Kittitas Counties 	Low impact	Moderate impact	Moderate impact
<ul style="list-style-type: none"> Number of cutter/hauler employees from Leavenworth, Yakima, Ellensburg, Cle Elum, and North Bend contracted by Plum Creek 	Low impact	Moderate impact	Moderate impact
<ul style="list-style-type: none"> Regional economy effects 	Low impact	Moderate impact	Moderate impact
<ul style="list-style-type: none"> Government taxes and revenues 	Low impact	Moderate impact	Moderate impact
4.10 Cultural Resources	HCP provides some level of protection on 170,600 acres	Less protection on acquired lands; greater protection on lands acquired by Forest Service; net decrease in Federal lands in Green River Basin	HCP protection applied to acquired lands; greater protection on lands acquired by Forest Service; net decrease in Federal lands in Green River Basin
4.11 Recreation Visitor Access (effects)	Majority of lands under NWFP and Plum Creek HCP; Plum Creek open lands policy continues, but road closures do occur	Majority of land is NWFP and less is Plum Creek HCP; recreational impacts depend on Forest Service management and access in contiguous areas and Grizzly Bear Recovery zone; Plum Creek open lands policy and road closures continue	Majority of land is NWFP and less is Plum Creek HCP; recreational impacts depend on Forest Service management and access in contiguous areas and Grizzly Bear Recovery zone; Plum Creek open lands policy and road closures continue
<ul style="list-style-type: none"> Auto travel 	Low impact	Moderate impact	Moderate impact
<ul style="list-style-type: none"> Hiking/walking trail 	Low impact	Least impact / Benefit	Least impact / Benefit
<ul style="list-style-type: none"> Dispersed camping 	Low impact	Moderate impact	Moderate impact
<ul style="list-style-type: none"> Hunting 	Low impact	Less roads means more security for game and less distribution of hunters; fewer harvest units impact ungulate prey	Same as Partial HCP

Table 2. Comparison by Analytical Criteria by Alternative

<u>Analytical Criteria</u>	<u>Alternative 1 (No Action)</u>	<u>Alternative 2 (Partial HCP)</u>	<u>Alternative 3 (Proposed Action)</u>
<ul style="list-style-type: none"> Fishing 	Low impact	Less roads means less impact to fish and less distribution of anglers	Same as Partial HCP except management of acquired lands benefits fish
<p>4.12 Visual Resources (View Plane Effects) All alternatives improve the visual quality as current visual impacts diminish with time</p>			
<ul style="list-style-type: none"> Roads 	Moderate impact	Low impact; less roads but acquired lands not managed to HCP standards	Least impact; fewer roads and acquired lands with HCP road standards
<ul style="list-style-type: none"> Utility Corridors 	No Effect	No Effect	No Effect
<ul style="list-style-type: none"> Ski Areas 	No Effect	No Effect	No Effect
<ul style="list-style-type: none"> Harvested Areas 	More uneven-aged management with less impact on East side; even-aged management common on West side	Far fewer lands subject to harvest; slight shift toward even-aged harvest with increase in West side lands	Same as Partial HCP except smaller units on acquired lands and greater retention of trees and snags
4.13 Trust Resources	Depend primarily on treatment of fish, wildlife, plant, and water resources; Plum Creek continues open lands policy and access to Tribes	Depend primarily on treatment of fish, wildlife, plant, and water resources; Plum Creek continues open lands policy and access to Tribes	Depend primarily on treatment of fish, wildlife, plant, and water resources; Plum Creek continues open lands policy and access to Tribes
4.14 Cumulative	NWFP and HCP provide benefit beyond what would occur with NWFP but without HCP	Minimal contribution to cumulative impact; management of acquired lands generates small but additional impact; small net decrease in low-elevation West side lands; conversion from relatively constant checkerboard pattern to more contiguous ownership in many areas	Same as Partial HCP, but HCP protection applied to acquired lands so slight additional benefit results

National Forest System lands in the HCP Planning Area occur within the boundaries of the Wenatchee and Mt. Baker-Snoqualmie National Forests. Although the NWFP and amended Forest Plans does do not provide management direction, guidelines, or regulation of private lands, ~~However,~~ the No Action Alternative is consistent with the final draft recovery plan for the northern spotted owl. All National Forest System lands in the HCP Planning Area would be managed according to the Forest Land and Resource Management Plans in each forest and the NWFP and its Aquatic Conservation Strategy (ACS), and the amended Forest Plans. National Forest System lands would be managed for late-successional, old growth, or Matrix forest characteristics. A portion of the National Forest System lands would be managed in accordance with the Snoqualmie Pass Adaptive Management Area Plan (SPAMA). Under SPAMA, newly acquired Federal lands would be managed to provide habitat for organisms associated with late-successional forests, and to contribute to critical wildlife connectivity objectives within the AMA. ~~the lands would be managed to provide a distribution of forest age structural classes and stream environments that provide habitat for late successional and old growth related native plants and wildlife species on National Forest System lands.~~ Plum Creek's management strategy in the Planning Area would complement the management strategy on adjacent National Forest System lands, which, under current Forest Plans would be subjected to minimal harvest in the future.

Plum Creek's management strategy in the HCP Planning Area "tiers" off the measures outlined in the NWFP and ACS by implementing standards and guidelines that, although different, are complimentary to the standards and guidelines in the NWFP. This strategy would increase the potential success of the NWFP, ~~is consistent with the objectives of SPAMA,~~ and ~~minimizes~~ reduces cumulative effects by ensuring the HCP's compatibility with adjacent National Forest System lands. There would be effects/consequences to unroaded and roadless areas as Plum Creek acquired access across Federal lands and constructed roads on their lands within such areas.

4.2.2 ALTERNATIVE 2 (PARTIAL HCP)

Under Alternative 2, lands acquired by Plum Creek in the Planning Area would not be covered by Company's HCP. Lands acquired from the Forest Service would be managed by Corporate Standard Management Practices (Section 1.2.3; HCP), Environmental Principles (Appendix 2; HCP), Washington State Forest Practices Rules and Regulations, and all other local, State, and Federal laws and regulations governing the management of forest lands. All other lands in the HCP Planning Area previously "covered" by Plum Creek's HCP and not part of the land exchange would continue to be covered by the HCP.

Lands acquired by the Forest Service in the Planning Area would be removed from Plum Creek's HCP and incidental take permit. These lands would be managed according to the Forest Land and Resource Management Plans in each forest and the NWFP and its ACS. All acquired lands would be managed for late-successional, old growth, or Matrix forest characteristics. A portion of the National Forest System lands would be managed in accordance with the SPAMA. Under SPAMA, newly acquired Federal lands would be managed to provide habitat for organisms associated with late-successional forests, and to contribute to critical wildlife connectivity objectives within the AMA. ~~The lands would be managed to provide a distribution of forest age structural classes and stream environments that provide habitat for late-successional and old growth related native plants and wildlife species on National Forest System lands.~~ Many Federal lands would no longer require roads for Plum Creek access and interspersed Plum Creek lands transferred to Forest Service could remain unroaded; thus, larger areas could be managed by the Forest Service as unroaded or roadless areas.

4.2.3 ALTERNATIVE 3 (PROPOSED ACTION)

Under the Proposed Action, Forest Service lands in the Planning Area acquired by Plum Creek would no longer be managed under the amended Forest Plans. Instead, these lands would be managed in accordance with the Company's properly implemented HCP (Section 3.0; HCP), Corporate Standard Management Practices (Section 1.2.3; HCP), Environmental Principles (Appendix 2; HCP), the Washington State Forest Practices Rules and Regulations, and all other local, state, and Federal laws and regulations governing the management of forest lands.

Likewise, Plum Creek lands acquired by the Forest Service in the Planning Area would not be managed in accordance with Plum Creek's HCP and other local and state regulations. Instead, these lands would be located in one of six NWFP designated categories and managed in accordance with the standards and guidelines associated with each category. The strategy that would be implemented on National Forest System lands would be supplemented by implementation of Plum Creek's HCP for new lands acquired by Plum Creek in the Planning Area. Management of lands acquired from the Forest Service in accordance with Plum Creek's HCP would not detract from the management goals and objectives on National Forest System lands within and adjacent to the Planning Area. Plum Creek's management strategy would "tier" off the measures outlined in the NWFP and ACS by implementing standards and guidelines that are different but complimentary to the standard and guidelines in the NWFP. This strategy would increase the potential success of the NWFP, ~~is consistent with the objectives of SPAMA,~~ and ~~minimizes~~ reduces cumulative effects by ensuring the HCP's compatibility with adjacent National Forest System lands. Many Federal lands would no longer require roads for Plum Creek access and interspersed Plum Creek lands transferred to Forest Service could remain unroaded; thus, larger areas could be managed by the Forest Service as unroaded or roadless areas.

4.3 LANDFORM AND GEOLOGY

Long-term soil productivity is defined as the ability of soil to maintain the natural growth potential of plants and plant communities over time (USDA and USDI 1994). The structure and function of ecosystems depend on a productive soil resource. Forest-management activities have the potential to reduce the productivity of soils unless certain guidelines are followed. Soil factors, which can be influenced by management activities, include soil moisture, soil aeration, organic-matter content, nutrient availability, soil biology, and sediment production.

The most-common disturbances of the soil by forest-management activities include soil displacement and compaction, erosion, and alteration of nutrient status and soil biology. Generally, areas which are not harvested have the greatest probability for maintaining long-term soil productivity. High-intensity burns can eliminate the organic material in the soil, expose large areas of mineral soil, and thereby increase the risk of erosion. Where timber harvest occurs, the soils can be subject to varying degrees of management-induced disturbance, and therefore have a lower probability of maintaining long-term soil productivity. Exposed soils can erode and contribute sediment to streams. A large amount of sediment delivery to streams comes from road building and/or use. The impact is proportional to the miles of road, quality of construction, and level of use. Best Management Practices (BMPs) control road construction to minimize soil and water quality impacts. The watershed prescriptions developed under watershed analysis also protect soils and reduce erosion.

Higher risks or impacts are associated with those alternatives comprising larger areas with intensive timber management or greater miles of road with lesser standards. When soils especially susceptible to erosion or disturbance are avoided and/or appropriate timber-harvest techniques are used, then minimal impact would occur. In fact, when current BMPs and riparian buffers are present, hill-slope erosion from harvest practices is minimal with no observed delivery of sediment to streams. Forest-management activities would not influence the landform or bedrock geology of the area under any of the proposed actions.

4.3.1 ALTERNATIVE 1 (NO ACTION)

Under the No Action Alternative, the consequences of timber management and harvest on soil compaction, soil displacement, erosion, and nutrient availability would be minimal because BMPs, Riparian Habitat Areas (RHAs), and watershed analysis prescriptions would be implemented. Washington State Forest Practices Rules and Regulations (Title 222 WAC) contain numerous BMPs intended to minimize the impacts of erosion and sedimentation on water quality. All of the BMPs ~~prohibit~~ prevent the degradation of aquatic resources in such a manner that it impairs the suitability of water for any aquatic life, wildlife, or human use (i.e., beneficial uses). Plum Creek's HCP incorporates these BMPs and focuses on the most-important BMPs including new road construction techniques, maintenance of inactive and abandoned roads, road drainage design, stream crossings and culvert installation, maintenance of active (i.e., mainline) haul roads, tractor and wheeled skidding, riparian management zones (including stream bank integrity practices), and riparian leave tree areas.

Under the No Action Alternative, minimum and interim RHAs and restrictions would be implemented on all fish-bearing streams, as well perennial and seasonal streams. These measures would ~~minimize~~ reduce the effects of timber management and harvest on soil compaction, soil displacement, erosion, and nutrient availability.

Under the No Action Alternative, watershed analysis would be conducted on an accelerated basis for all watershed administrative units (WAUs) in the Planning Area in which Plum Creek owns more than 10 percent of the land. The watershed analysis process (WAC 222-22) was established to evaluate the cumulative effects of forest practices in Washington. Watershed analysis would provide customized forest practice prescriptions that would go beyond standard BMPs for certain situations. Watershed analysis would identify existing erosion and mass-wasting problem sites, whether natural or induced by past timber-management practices. The potential for future problems would also be determined and measures to prevent, avoid, or minimize problems from occurring, would be prescribed. These prescriptions would be used to tailor management plans for each particular watershed. Watershed analysis would also help to avoid, or provide additional protection to, sensitive areas. For example, areas containing soils susceptible to erosion, serpentine soils, steep slopes, and unstable bedrock would be located. Once located, protective mitigation measures specifically designed to address these sensitive areas would be implemented, thereby greatly reducing the potential for sediment delivery to streams. Areas susceptible to mass-wasting would also receive additional protection or would be avoided. Compliance with the prescriptions developed from a watershed analysis is regulated by the DNR. A watershed-by-watershed management plan would help prevent cumulative soil-related impacts. In addition to complying with all applicable Forest Practices Rules and Regulations and BMPs, Plum Creek would also implement its standard management practices for road building and maintenance (Section 1.2.3.4; HCP).

Under all alternatives, road building and maintenance would be conducted in compliance with Washington's Forest Practice Rules and Regulations (WAC 222-24-020 to 222-24-050). Under the No Action Alternative, additional protective measures would be prescribed during watershed analysis for road building and maintenance. For example, following harvest operations, selected roads may be restricted or closed depending on silviculture and management objectives and prescriptions developed during watershed analysis. Roads would be gated where agreed upon by Plum Creek, the Services, and/or the Forest Service. Because watershed analysis would be conducted on an accelerated basis, persistent erosion or water-quality problems caused by roads would be identified sooner and addressed, possibly resulting in road closures or abandonment. Additional road closures would be implemented, as needed, under this alternative for wildlife conservation. Under the No Action Alternative, the amount of sediment produced from unused road surfaces would decrease over time and sediment delivery to streams would be reduced.

Under the No Action Alternative, RHAs would be established and maintained along all fish-bearing streams and most nonfish-bearing, seasonal streams. These streams would not receive comparable protection under current State Forest Practice Rules and Regulations. In addition, timber falling-contractors would be required to avoid yarding logs through the streams not categorized above, and they would be prohibited from causing unnecessary soil erosion or degrading side slopes.

4.3.2 ALTERNATIVE 2 (PARTIAL HCP)

Under Alternative 2, approximately ~~10,200~~^{10,800} acres of lands would be acquired by Plum Creek from the Forest Service in the Planning Area. These lands would not be managed under the Company's HCP. Instead, forest-management activities on newly acquired lands would be managed under applicable State Forest Practice Rules and Regulations and corporate standard management practices and Environmental Principles.

Road building and maintenance would be conducted in compliance with Washington's Forest Practice Rules and Regulations (WAC 222-24-020 to 222-24-050) and Plum Creek's standard management practices for road building and maintenance (Section 1.2.3.4; HCP).

Unless previously completed, wWatershed analysis has been completed may not be performed in watersheds within the newly acquired lands in the near future. Lessons learned or pPrescriptions developed in adjacent watershed analyses may not would be operationally incorporated into non-HCP lands. Thus, additional protective measures would not be prescribed for road building and maintenance. Additional protection for sensitive areas would be reduced. For example, areas containing soils susceptible to erosion, serpentine soils, steep slopes, and unstable bedrock may not be located on the newly acquired lands. Thus, protective mitigation measures specifically designed to address these sensitive areas would not be implemented, thereby greatly increasing the potential for sediment delivery to streams. Areas susceptible to mass-wasting may not be identified prior to timber harvesting operations and protecting or avoiding these sites may be difficult. Road closures in the newly acquired lands would be at the discretion of Plum Creek.

Under Alternative 2, Riparian Management Zones (RMZs) would be established and maintained along all fish-bearing streams on newly acquired lands as required under State Forest Practice Rules and Regulations. However, most nonfish-bearing, seasonal streams would not receive similar~~the same~~ protection under current State Forest Practices Rules and Regulations. ~~FPA regulations~~.

Lands acquired by the Forest Service would be removed from Plum Creek's HCP and ITP, and managed under the NWFP and ACS. The more restrictive riparian protection provided under the ACS may offset the reduced riparian protection that would be required to protect stream corridors on the lands Plum Creek acquires from the Forest Service. ~~Overall~~ On the east side of the Crest, the impact of timber management and harvest on soil compaction, soil displacement, erosion, and nutrient availability would occur under this alternative, but impacts would be minimal because most of the land base in the east side of the Planning Area would be adequately protected by Plum Creek's HCP and the NWFP amended Forest Plans. However, on the west side, conversion from NWFP to State regulations may result in some negative impact.

4.3.3 ALTERNATIVE 3 (PROPOSED ACTION)

Under the Proposed Action Alternative, lands acquired by Plum Creek from the Forest Service in the Planning Area would be managed under the Company's HCP. Therefore, the consequences of timber management and harvest on soil compaction, soil displacement, erosion, and nutrient availability would be the same for land managed by Plum Creek as under the No Action Alternative. Overall, there would be less effect because thousands of acres of Plum Creek's lands would be transferred to the Forest Service and managed under the more conservative Rules and Regulations of the National Forests. However, in some areas such as the Green River where the net change in land is a slight loss of Federal ownership, these benefits would not occur. Under the Proposed Action Alternative, watershed analysis would be conducted on an accelerated basis for all WAUs in the Planning Area in which Plum Creek owns more than 10 percent of the land. The number of WAUs in which Plum Creek would initiate watershed analysis is the same under the Proposed Action Alternative as under the No Action Alternative. Watershed analysis would identify existing erosion and mass-wasting problem sites, whether natural or induced by past timber management practices. The potential for future problems would also be determined and measures to prevent, avoid or minimize problems from occurring, would be prescribed. These prescriptions would be used to tailor management plans for each particular watershed. Watershed analysis would also help to avoid, or provide additional protection to, sensitive areas.

Under all alternatives, road building and maintenance would be conducted in compliance with Washington's State Forest Practices Rules and Regulations (WAC 222-24-020 to 222-24-050). In addition to complying with all applicable State Forest Practices Rules and Regulations and BMPs, Plum Creek would also implement its standard management practices for road building and maintenance (Section 1.2.3.4; HCP). Under Alternative 3, additional protective measures would be prescribed during watershed analysis for road building and maintenance. For example, selected roads may be restricted or closed depending on silviculture and management objectives and prescriptions developed during watershed analysis. Roads would be gated where agreed upon by Plum Creek, the Services, and/or the Forest Service. Because watershed analysis would be conducted on an accelerated basis, persistent erosion or water-quality problems caused by roads would be identified sooner and addressed, possibly resulting in road closures or abandonment. Additional road closures would be implemented, as needed, under this alternative for wildlife conservation. Under the Proposed Action Alternative, the amount of sediment produced from unused road surfaces would decrease over time and sediment delivery to streams would be reduced.

RHAs under the Proposed Action Alternative would be established and maintained along all fish-bearing streams and most nonfish-bearing, perennial ~~seasonal~~ streams on Plum Creek's lands. In addition, timber-felling contractors would be required to avoid yarding logs through the streams not categorized above, and they would be prohibited from causing unnecessary soil erosion or degrading side slopes.

4.4 AIR QUALITY

4.4.1 ALTERNATIVE 1 (NO ACTION), AND ALTERNATIVES 2 (PARTIAL HCP) AND 3 (PROPOSED ACTION)

Management and harvest activities on forest lands can adversely affect air quality in two principal ways: (1) creating fugitive dust from logging roads; and, (2) releasing small particulates during prescribed burns. Traditionally controlled burns have been used in forestry to dispose of slash, to prepare sites for planting by eliminating brush and debris, and to reduce risk for large fires by eliminating the fuel build-up through controlled burns. Controlled burns are now regulated by DNR's Smoke Management Plan (WDNR 1993). This plan specifies what type and when fires would be permitted as part of management activities. With the restrictions imposed by the Smoke Management Plan, prescribed burns are no longer used as a standard forest-management tool on Plum Creek lands. During the period 1977 to 1980, between 160 to 1,600 acres (average 800 acres) of slash were burned each year. Since 1991, there have been no prescribed burns on Plum Creek lands in the Planning Area. While burning may be used in a few controlled instances in the future, it is no longer a common management tool used by Plum Creek as in the Planning Area. Under all alternatives, Plum Creek would meet DNR's requirements as specified in the Smoke Management Plan (WDNR 1993), and air quality in the Planning Area would not be adversely affected.

Fugitive dust is a function of the miles of logging roads, quality of road, its maintenance, and level of road use. Plum Creek currently meets DNR's requirements for road construction and the control of fugitive dust and would continue to meet those requirements in the future under all of the alternatives. Road use includes forest harvest/management traffic and public traffic. Plum Creek and the Forest Service will construct some new roads in the Planning Area in the future. However, under the No Action Alternative, Plum Creek would carefully manage its road system, eliminate or gate side roads that are no longer in use, and limit the construction of new roads to the minimum needed for safe operation and efficient harvest. Although road management strategies would be the same under each alternative, Alternatives 2 and 3 would result in fewer roads being constructed, because there would be a reduced need to construct access roads across National Forest System lands and because Plum Creek would own less acreage in the Planning Area. Consequently, under Alternative 3 there would be a decrease in total harvesting operations and road building and therefore, less impacts due to fugitive dust. A consequence unrelated to air quality, but nevertheless important, is that fewer road miles open to public access will benefit wildlife conservation.

4.5 WATER QUALITY AND QUANTITY

4.5.1 ALTERNATIVE 1 (NO ACTION)

Under the No Action Alternative, the Riparian Management Strategy (see Section 3.3; HCP) would provide the basis for implementing the ecosystem management objectives of the HCP related to aquatic resources. HCP standards and guidelines would be upgraded for individual watersheds as a result of prescriptions developed from watershed analysis. The Riparian Management Strategy (Section 3.3; HCP) was designed to ~~minimize~~ **reduce** impacts on water quality and quantity by reducing the potential for erosion and soil compaction. The RHAs would require limiting harvesting near streams to ~~minimize~~ **reduce** soil disturbance from ground-based equipment.

The No Action Alternative would give special consideration to fish-bearing streams and adjacent habitat areas. The HCP specifies 200-foot RHAs on all fish-bearing streams in the Planning Area. The HCP also specifies 100-foot RHAs on perennial streams in watersheds with anadromous fish, bull trout, or 303(d) concerns east of the Cascade crest and would prohibit ground-based equipment within 30 feet of the streams. Small, seasonal streams with the potential for landslides or surface erosion would be addressed through a combination of State Forest Practice Rules and Regulations and watershed analysis. The HCP also provides protection to inner gorges; and since it retains leave trees in the uplands, leave trees will likely be left along smaller streams that would otherwise not receive such protection. The RHAs would also provide a high level of shade retention to maintain cool stream temperatures. The HCP proposes a monitoring program to test the effectiveness of the various Riparian Management Strategies, including RHAs and Riparian Leave Tree Areas (RLTAs) on maintaining stream temperatures and meeting State water quality standards (Sections 3.3.5 and 5.1.6).

The RHAs outlined under the Riparian Management Strategy would provide root strength and protect stream bank stability in some erosion-prone areas. Watershed analysis would be used to identify erosion-prone areas throughout the Planning Area and appropriate prescriptions would be implemented as required. Prior to completion of watershed analysis, State Forest Practices Rules and Regulations are in place to prevent harvest operations in slide-prone areas.

While timber harvesting over large areas of the Planning Area could increase stream flows during many parts of the year, the magnitude of increase would rarely be large enough to make a material difference, particularly during floods. The HCP has considered the stochastic potential for floods in the Riparian Management Strategy by protecting floodplain and wetland areas through the RHAs and watershed analysis prescriptions. Additionally, the HCP described measures to address situations such as large-scale disturbances that drastically change the landscape (Sections 5.3.1 Unforeseen Circumstances and Section 5.3.2 Extraordinary Circumstances). One of the most important objectives of the Riparian Management Strategy is to maintain instream flow and the natural hydrologic regimes in the Planning Area.

Road building and use of the road system in the Planning Area would be analyzed to identify erosion and sedimentation problems to ~~minimize~~ **reduce** sediment delivery directly to streams. Finally, any forest practices that could affect water supplies within the watersheds would receive special consideration to ensure that adequate water quality is maintained.

4.5.2 ALTERNATIVE 2 (PARTIAL HCP)

Under Alternative 2, all lands acquired by Plum Creek from the Forest Service in the Planning Area would be managed under current State Forest Practices Rules and Regulations. These lands would not receive the benefit of the HCP's Riparian Management Strategy and as a result, the same level of protection on Plum Creek's lands, provided under the No Action and Proposed Action Alternatives, would not be implemented. However, under Alternative 2 a greater portion of the Planning Area would be managed under the NWFP and ACS. The added protection of water quality provided on National Forest System lands by the ACS may offset the lesser protection that would be provided on Plum Creek's lands under this alternative. Overall, Alternative 2 may provide the least protection of water quality among the alternatives analyzed.

4.5.3 ALTERNATIVE 3 (PROPOSED ACTION)

Under the Proposed Action Alternative, all lands acquired from the Forest Service in the Planning Area would be managed under Plum Creek's HCP. Plum Creek would continue to use watershed analysis to focus on fish, fish habitat, and water quality and quantity issues, and the Riparian Management Strategy would be implemented to protect fish-bearing and nonfish-bearing streams, and riparian areas. Therefore, environmental consequences under the Proposed Action Alternative would be the same or less as under the No Action Alternative, because a greater proportion of the land within the Planning Area would become subject to the protection afforded on National Forest System lands by the Aquatic conservation Strategy. However, in some areas, such as the Green River Basin, where the net change in land is a slight loss of Federal ownership, these benefits would not occur.

4.6 VEGETATION

Stand structures were used in the HCP to provide the basis for evaluating habitat diversity at the landscape level. The reason for using stand structures in the HCP is that it incorporates various stages of forest development, relates to the biological needs of forest wildlife, and can be easily identified and mapped across all ownership's in the Planning Area. Furthermore, used as a coarse-grained planning tool at the landscape level and "calibrated" with updated inventory data and ground verification (Sections 2.3 and 5.1.1), stand structures provide a viable method to assess current conditions and changes over time in the Planning Area.

To address long-term habitat conditions in the Planning Area, Plum Creek provided estimates of the percentage of lands that would be maintained in diverse forest structural stages to the end of the HCP period. These structural stages range from stand initiation to old growth forests and are defined in Section 2.2.3.4 of the DEIS (HCP DEIS, 1996) and are summarized by alternative in Table 3.

4.6.1 ALTERNATIVE 1 (NO ACTION)

Under the No Action Alternative, there would be minimal change in late-successional structural stages (i.e., MF, MOG, and OG) over the HCP period, reflecting the non-declining late-successional forests in the Planning Area. Across the entire Planning Area, early-successional stages (SI/SS and YF) would decline from approximately 30 percent in 1996 to approximately ~~42~~13 percent in 2045; mid-successional stages

(PT and DF) would increase from approximately ~~19~~¹⁸ percent to 30 percent; and late-successional stages (MF, MOG, and OG) would increase from ~~38~~³⁹ percent to ~~45~~⁴⁴ percent.

Harvest deferrals, RHAs, RLTA's, and other areas under special restrictions would all contribute to the vegetative condition in the Planning Area and would respond positively to the needs of a number of wildlife species and provide linkages to habitat throughout the Planning Area.

Talus slopes are defined as areas at the base of steep slopes and cliffs where broken and dislodged rock fragments accumulate adjacent to forests. There are a number of rare plant communities that are associated with talus slopes (Section 3.6.4; HCP DEIS.). The biological objective of the HCP is to maintain the integrity of these sites by retaining forests adjacent to talus slopes, which provide shade and downed logs for foraging and shelter for animals and habitat for associated plant life. Because habitat will be maintained no adverse impacts to plant communities associated with talus slopes are anticipated.

Serpentine soils and the plant communities that rely upon these areas (e.g., Thompson's Chaenactis) would not be affected under the No Action Alternative. Plum Creek has mapped the areas containing serpentine soils in the Planning Area, and because these soils are generally of low productivity, timber-management activities would be minimal.

Federal and State listed plant species in the Planning Area would not be adversely affected under the No Action Alternative because of the provisions in the HCP which would reduce impacts to plant communities. These measures include harvest deferrals, RHAs, RLTA's, and wetland, talus slope, and serpentine soil protection.

Under all alternatives, Plum Creek would comply with all control measures required by the Washington Administrative Code and Revised Code of Washington (Title 16 and 17, 1992) to control noxious plant and weed species in the Planning Area.

4.6.2 ALTERNATIVES 2 (PARTIAL HCP) AND 3 (PROPOSED ACTION)

Under Alternative 2 and the Proposed Action Alternative, there would be minimal change in late-successional structural stages (i.e., MF, MOG, and OG) over the HCP period, reflecting the non-declining acreage of late-successional forests in the Planning Area. Across the entire Planning Area, early-successional stages (SI/SS and YF) would decline from approximately 30 percent in 1996 to approximately ~~15-16~~¹⁰⁻¹¹ percent in 2045; mid-successional stages (PT and DF) would increase from approximately ~~19~~¹⁸ percent to ~~29-30~~³⁰⁻³¹ percent; and late-successional stages (MF, MOG, and OG) would increase from approximately ~~38~~³⁹ percent in 1996 to approximately ~~48-49~~⁴⁶ percent in 2045.

Under both alternatives, harvest deferrals, RHAs, RLTA's, and other areas under special restrictions in the HCP would all contribute to the vegetative condition in the Planning Area and would respond positively to the needs of a number of wildlife species and provide linkages to habitat throughout the Planning Area. However, under Alternative 2 lands acquired by Plum Creek in the Planning Area would not be managed under the HCP and may not provide the same benefit to wildlife species, especially riparian dependent wildlife species. The increase in National Forest System lands in the Planning Area, especially in LSRs and the AMA, would offset the expected reduction in riparian vegetation that would occur on Plum Creek's lands under Alternative 2.

Under the proposed action, habitat will be maintained on talus slopes, therefore, no adverse impacts to plant communities associated with talus slopes would occur. Impacts to Serpentine soils would be minimal under both alternatives because these soils are normally of low productivity and timber-management activities on or in the vicinity of these soils would be minimal.

Table 3. Percentage forest stand type projections in acres for all ownerships, by alternative and by decade (decades correspond to issuance of permit in 1996).

<u>Alternative and Stand Type</u>	<u>1996</u>	<u>2006</u>	<u>2016</u>	<u>2026</u>	<u>2036</u>	<u>2046</u>
Alternative 1 (No Action)						
Non-Forested	13	13	13	13	13	13
Stand initiation/Shrub sapling	11	14	7	5	5	8
Young Forest	19	18	16	10	7	5
Pole timber	5	6	14	15	14	9
Dispersal forest	13	10	11	16	19	21
Mature Forest	25	22	20	20	20	22
Managed Mature Old growth	8	10	11	12	12	12
Old growth	6	7	8	9	10	10
Alternative 2 (Partial HCP)						
Non-Forested	13	13	13	13	13	13
Stand initiation/Shrub sapling	11	13	6	4	4	6
Young Forest	19	19	16	10	7	5
Pole timber	5	6	15	15	13	9
Dispersal forest	13	9	11	16	19	21
Mature Forest	25	22	20	20	21	22
Managed Mature Old growth	8	11	11	13	13	14
Old growth	6	7	8	9	10	10
Alternative 3 (Proposed Action)						
Non-Forested	13	13	13	13	13	13
Stand initiation/Shrub sapling	11	13	7	4	4	6
Young Forest	19	18	16	11	7	5
Pole timber	5	6	15	15	14	10
Dispersal forest	13	10	11	16	20	20
Mature Forest	25	22	19	20	20	22
Managed Mature Old growth	8	11	12	12	13	14
Old growth	6	7	7	9	9	10

Federal and State listed plant species in the Planning Area would not be adversely affected under these alternatives because of the provisions in the HCP (e.g., harvest deferrals, RHAs, RLTA, and wetland, talus slope, and serpentine soil protection) which would reduce impacts to plant communities. Even on lands in the Planning Area not managed by the HCP under Alternative 2, Plum Creek would comply with all applicable local, State, and Federal rules and regulations protecting Federal and state listed plant species. On National Forest System lands, Federal and State listed species would be protected under the NWFP.

Under all alternatives, Plum Creek would comply with all control measures required by the Washington Administrative Code and Revised Code of Washington (Title 16 and 17, 1992) to control noxious plant and weed species in the Planning Area.

4.7 WILDLIFE

Adoption of one of the alternatives, and subsequent forest-management activities may potentially impact wildlife species by: (1) direct killing or injury to individuals, (2) indirect disturbance leading to the loss of individuals or reproductive capability, (3) reducing suitable habitat leading to the indirect loss of individuals or reproductive capability, and (4) fragmenting and isolating animal populations causing disjunct distributions and decreased genetic flow between populations. Conversely, the adoption of certain alternatives benefits wildlife species by providing relatively greater protection than would occur under the other alternatives. All of the alternatives described herein provide far greater benefits and fewer impacts than would occur in the absence of the HCP. The impacts discussed below for each of the alternatives is based on projections for the HCP period, and includes models that describe changes to forest communities (stand structures) and timber harvesting, planting, fertilization, and thinning schedules. Additional information regarding the impacts to wildlife species and communities is presented in the HCP, its attendant technical reports, and the HCP modification document.

It is assumed for purposes of impacts analysis that during implementation of the HCP, the Forest Service will continue to implement the Northwest Forest Plan strategies on all Federal lands under its jurisdiction in the Planning Area. Assumptions are further described in the HCP modification document, Section 2.2.3.

Due to complexities of modeling, interspersed DNR lands were modeled under assumptions made in the FEIS (1996). Instead of modeling the DNR lands according to their roles in the DNR HCP, those lands were modeled the same as all other “private” ownerships in the Planning Area. The aggressive harvests modeled for the DNR lands is an aggressive over-estimate of harvest activity and is a “worse-case scenario” for species relying on mature forest with structure, and special habitats. The management occurring under that HCP and described in the HCP modification document section 2.3 was factored into the Services’ overall assessment of impacts.

The vertebrate wildlife species that are expected or may potentially occur in the Planning Area have been prioritized by their respective legal and biological status into four groups: (1) Section 10(a) Permit Species; (2) Special Emphasis Species; (3) Species of Concern; and (4) Associated Species.

The HCP was designed to provide early protection for a large number of species and, perhaps, help prevent subsequent declines. The HCP addressed potentially all vertebrate species that may, at one time or another during their life-cycle, use or be associated with habitats occurring within the Planning Area during the life of the permit. By considering the physical and biological needs of a large combination of species that could potentially use the Planning Area, the HCP is a comprehensive ecosystem-based management plan addressing more than 285 species including at least 77 mammals, 178 birds, 13 reptiles, 13 amphibians, and considerably greater than 4 species of fish.

This approach is considered to be an “ecosystem-management” approach because it focuses on components of the ecosystem and their functions, and looked across the entire landscape to determine how these components were and would be distributed over time. It concentrated on healthy riparian systems; mature

forest with structure; availability of forest structural stages over time; and special treatments and considerations of special habitat areas such as caves, talus, wetlands, and unique forest types. In order to take this approach, it was necessary to aggregate the large number of species into a workable number of groups by similarities between the species habitat requirements, relate the needs of those groupings to habitat characteristics, and then predict the availability of those habitats over the HCP period. This EIS assessment re-evaluates the effect of the HCP upon the Lifeforms, but also focuses specific scrutiny on particular species to evaluate whether this “ecosystem-management” approach may be successful in adequately addressing the wildlife species.

4.7.1 SECTION 10(A) PERMIT SPECIES

4.7.1.1 NORTHERN SPOTTED OWL

4.7.1.1.1 Background

In the Planning Area, both direct and indirect impacts to spotted owls as a result of forest-management activities were considered. Direct impact occurs when an action causes death or injury in a proximate manner to a spotted owl. An indirect impact occurs when a nest stand is harvested outside the breeding season, displacing the owl pair that occupied the site during the nesting and fledging seasons. Indirect impact will also occur when forest-management activities in forest stands close to owl nest-sites either precludes the use of the stand for foraging and/or reduces habitat within a home range to a threshold below that which would support a pair or single owl.

Effects of forest-management activities in the Planning Area may impact the spotted owl by: (1) direct killing or injury of owls, (2) disturbing ~~actively nesting owls~~ pairs within the nesting area, (3) reducing suitable habitat within the home range of ~~an owl nesting pair~~, and (4) reducing dispersal habitat for adult and juvenile owls for travel within and between areas containing suitable habitat. The Service does not intend or anticipate the direct injury or death of any owl. The principal expected form of impact is displacement of spotted owls due to modifications of owl habitat, including areas with nest sites. Nesting, roosting, foraging, and dispersal habitat will be harvested annually in the Planning Area. Due to the favorable distribution of suitable habitat on Plum Creek lands and on adjacent National Forest lands, no significant net loss of habitat is anticipated, measured over the HCP period, because habitat will be replaced through growth of younger forest stands on both Plum Creek and National Forest lands. Plum Creek will avoid the direct injury to spotted owls, protect habitat, and facilitate dispersal of adult and juvenile owls.

This analysis focuses on the amount and distribution of habitats expected to result from implementation of the alternatives, and the resulting impacts upon the carrying capacity of the landscape in terms of spotted owl pairs. Application of the Resource Selection Probability Function (RSPF) model (Irwin and Hicks 1995) to the managed landscapes estimated by the alternatives and the Northwest Forest Plan suggest that the impacts of the alternatives on the area’s capability to support spotted owls will be minimal. To provide a “high end” and “low end” estimate of the effects of the Plan on carrying capacity, the RSPF model was applied to the Planning Area in two different ways: (1) The Planning Area and surrounding buffer area were analyzed for the number of potential pairs and single owls that may occur; and (2) The Planning Area only was analyzed for just the number of spotted owl pairs that could occur.

4.7.1.1.2 Description of HCP Conservation Measures

Modeling of spotted owl habitat in the Planning Area over the HCP period indicated that total habitat for spotted owls (i.e., NRF and FD) will be greater in the Planning Area, at the end of the HCP period (i.e., 2045). The increase in total owl habitat is due to two major factors: (1) forest in-growth following historical harvest on all ownership's which will develop into FD habitat; and (2) a substantial reduction in harvesting of NRF and FD habitat on Federal lands.

However, the modeling also suggested that habitat levels would decline slightly, and potentially affect owl populations during the first 20 years of the HCP period (i.e., until about 2016). This slight decline in owl habitat is the result of continuous harvesting of owl habitat on nonfederal ownership, and insufficient time for regrowth in old harvest-units to replace previously harvested habitat. This situation is similar to conditions predicted in both the Interagency Spotted Owl Committee Report (Thomas et al. 1990) and the final draft Recovery Plan (Lujan et al. 1992b) regarding trends of future habitat throughout the range of the spotted owl. HCP Section 3.3.1.1 provided an analysis of spotted owl habitat trends in the Planning Area.

To address this short-term reduction of owl habitat, a network of NRF harvest deferrals and FD corridors were designed in the Planning Area. The specific objectives of the NRF deferrals and FD corridors are to:

1. Support productive pair sites in the Planning Area;
2. Link Federal NRF and FD habitat in spotted owl high-density "cluster" areas;
3. Augment and connect riparian habitat areas where NRF and FD habitat currently exist; and
4. Provide dispersal opportunities for spotted owls between high-density "cluster" areas.

More than 2,600 acres of currently NRF habitat were designated as NRF deferrals to remain unharvested for at least 20 years. More than 3,200 acres of current FD or NRF habitat were designated as FD corridors with selective-harvest prescriptions employed to harvest some merchantable timber while retaining FD habitat throughout the HCP period.

To maximize the biological value of the NRF deferrals and FD corridors, Plum Creek prioritized the 107 spotted owl sites then known in the Planning Area (Herter et al. 1995) and identified 30 sites where deferrals and corridors would be essential to maintaining spotted owl productivity through the first 20 years of the HCP period. Additional information in the prioritization of owl sites can be found in Herter et al. (1995) and criteria for selecting deferrals and corridors can be found in HCP Section 3.2.1.1.

In addition to the habitat provided through deferrals and the commitments to minimum amounts of NRF and FD habitat, the HCP also includes monitoring and adaptive management. If the monitoring indicates that fewer than 80 percent of the predicted owl sites exist, the deferral strategy will be adjusted. The definition of foraging habitat may be adjusted as a result of spotted owl prey monitoring. Plum Creek conducts project-level surveys in areas likely to contain nesting owls. Plum Creek will consider conducting harvests near those sites with less biological value first, and when entering sites, will consider entering stands furthest from the site center first. Active owl nest sites also receive seasonal protection from disturbance.

The following sections describe the relative effects of the alternatives on four issues that management of the landscape will effect: 1) Deferrals, 2) Amount and type of habitat, 3) Distribution and patch size of habitat, and 4) Carrying capacity.

4.7.1.1.2.1 *Deferrals*

Alternative 1 (No Action). Plum Creek would retain over 2,600 acres as NRF habitat and 3,200 acres as FD habitat in the vicinity of over 30 owl sites to ameliorate the effects of timber harvest at the landscape level. This strategy retains the most-productive sites while NRF habitat is preserved or develops on adjacent Federal lands and in RHAs, and provides dispersal corridors to this habitat. NRF deferrals are planned for 20 years but may extend longer, have additional deferral acreage added, or be moved as a result of the validation monitoring. In addition, much of the potential harvest of some habitat adjacent to over 30 of the most-productive owl sites would continue to be deferred for at least 20 years. Upland, dispersal habitat would be retained by harvesting to FD standards and retaining the FD habitat through the remainder of the permit period. This strategy retains the most productive sites and provides dispersal corridors while NRF habitat is preserved or develops on adjacent Federal lands and in RHAs.

Alternative 2 (Partial HCP). Plum Creek would retain 474 acres as NRF habitat and 882 acres as FD habitat in the vicinity of 12 owl sites as a result of the new ownership patterns. However, NRF deferrals would continue to be planned for 20 years but may be adjusted as under the No Action Alternative in response to the validation monitoring. Validation monitoring areas would be adjusted in responses to the new ownership patterns.

Alternative 3 (Proposed Action). Plum Creek would retain 320 acres as NRF habitat and ~~1020~~1030 acres as FD habitat in the vicinity of over 11 owl sites. NRF deferrals would continue to be planned for 20 years but may be adjusted as under the no-action alternative in response to the validation monitoring. Adjustments would be made to validation monitoring areas in response to new ownership patterns. Approximately 114 acres of FD habitat will be added to an existing deferral to account for the change in ownership and management surrounding one owl site post-land exchange.

4.7.1.1.2.2 *Amount and Type of Habitat*

Alternative 1 (No Action). As displayed in DSEIS Tables 4 and 5, total spotted owl habitat (NRF and FD) in the Planning Area will increase on Plum Creek lands and on Federal lands over the HCP period. Total habitat for spotted owls will decrease during the first 20 years of the plan, from 47 percent of the total Planning Area in 1996 to ~~42~~41 percent in 2016. For the following 30 years (i.e., 2016 through 2045) total habitat for spotted owls in the Planning Area will increase from ~~42~~41 percent to ~~57~~53 percent.

The type of spotted owl habitat provided by the HCP and the ~~Northwest Forest Plan~~ **amended Forest Plans** will change as summarized in Table 4. NRF habitat will decrease slightly in the Planning Area during the first 20 years, from ~~30~~29 percent in 1996 to ~~27~~26 percent in 2016, and increase slightly during the final 30 years of the plan to ~~29~~27 percent. Similarly, FD habitat will decrease slightly in the first 2 decades, from ~~17~~18 percent in 1996 to 15 percent in 2016, but will increase significantly to ~~28~~27 percent by 2045.

The combined efforts of the ~~NWFP~~ **amended Forest Plans** and the HCP will reduce the anticipated shortfall of habitat mid-way through the HCP period and provide for more spotted owl habitat on the landscape at

the end of the HCP period, thereby reducing impacts to spotted owls by slowing a trend of habitat loss and facilitating regional recovery of the species over time.

An important contribution of the HCP to recovery of the spotted owl will be developing dispersal habitat to improve demographic interchange of spotted owls in the I-90 corridor. Dispersal habitat will more than double over the HCP period. The “filling in” of dispersal habitat will occur between NRF habitat areas. Dispersal habitat will provide “stopover” and “resting” places where adults and juveniles would find suitable cover and foraging opportunities and reduced exposure to predators while dispersing. Dispersal habitat will link Designated Conservation Areas (DCAs) and will facilitate the movement and distribution of juvenile and adult spotted owls among and between NRF areas.

Table 4. Spotted Owl Habitat in the Planning Area on all Ownerships by Decade, by Alternative (Percent).

	<u>1996</u>	<u>2006</u>	<u>2016</u>	<u>2026</u>	<u>2036</u>	<u>2045</u>
No-Action Alternative						
Foraging/Dispersal	18	15	15	19	22	26
Nesting/ Roosting / Foraging	<u>29</u>	<u>27</u>	<u>26</u>	<u>26</u>	<u>27</u>	<u>27</u>
Subtotal (Owl Habitat)	47	42	41	45	49	53
Non-Forested	13	13	13	13	13	13
Non-Habitat	<u>40</u>	<u>45</u>	<u>46</u>	<u>42</u>	<u>38</u>	<u>34</u>
Total	100	100	100	100	100	100
Partial HCP						
Foraging/Dispersal	18	14	15	19	23	25
Nesting/ Roosting / Foraging	<u>29</u>	<u>27</u>	<u>27</u>	<u>28</u>	<u>29</u>	<u>29</u>
Subtotal (Owl Habitat)	47	41	42	47	52	54
Non-Forested	13	13	13	13	13	13
Non-Habitat	<u>40</u>	<u>46</u>	<u>45</u>	<u>40</u>	<u>35</u>	<u>33</u>
Total	100	100	100	100	100	100
Proposed Plan						
Foraging/Dispersal	18	15	15	19	23	25
Nesting/ Roosting / Foraging	<u>29</u>	<u>27</u>	<u>26</u>	<u>27</u>	<u>28</u>	<u>28</u>
Subtotal (Owl Habitat)	47	42	41	46	51	53
Non-Forested	13	13	13	13	13	13
Non-Habitat	<u>40</u>	<u>45</u>	<u>46</u>	<u>41</u>	<u>36</u>	<u>34</u>
Total	100	100	100	100	100	100

Table 5. Spotted Owl Habitat on Plum Creek Lands by Decade, by Alternative

	<u>1996</u>	<u>2006</u>	<u>2016</u>	<u>2026</u>	<u>2036</u>	<u>2045</u>
No-Action alternative						
Foraging/Dispersal	17	12	10	18	27	34
Nesting/ Roosting / Foraging	<u>20</u>	<u>13</u>	<u>10</u>	<u>9</u>	<u>9</u>	<u>10</u>
Subtotal (Owl Habitat)	37	25	20	27	36	44
Non-Forested	8	8	8	8	8	8
Non-Habitat	<u>55</u>	<u>67</u>	<u>72</u>	<u>65</u>	<u>56</u>	<u>48</u>
Total	100	100	100	100	100	100
Partial HCP						
Foraging/Dispersal	14	8	8	16	27	31
Nesting/ Roosting / Foraging	<u>18</u>	<u>10</u>	<u>9</u>	<u>9</u>	<u>9</u>	<u>10</u>
Subtotal (Owl Habitat)	32	18	17	25	36	41
Non-Forested	5	5	5	5	5	5
Non-Habitat	<u>63</u>	<u>77</u>	<u>78</u>	<u>70</u>	<u>59</u>	<u>54</u>
Total	100	100	100	100	100	100
Proposed Plan						
Foraging/Dispersal	14	10	8	16	26	31
Nesting/ Roosting / Foraging	<u>18</u>	<u>9</u>	<u>6</u>	<u>6</u>	<u>6</u>	<u>7</u>
Subtotal (Owl Habitat)	32	19	14	22	32	38
Non-Forested	5	5	5	5	5	5
Non-Habitat	<u>63</u>	<u>76</u>	<u>81</u>	<u>73</u>	<u>63</u>	<u>57</u>
Total	100	100	100	100	100	100

Alternative 2 (Partial HCP). As displayed in Tables 4 and 5, total spotted owl habitat (NRF and FD) in the Planning Area will increase on Plum Creek lands and on Federal lands over the HCP period. Total habitat for spotted owls will decrease during the first 20 years of the plan, from 47 percent of the total Planning Area in 1996 to ~~44~~42 percent in 2016. For the following 30 years (i.e., 2016 through 2045) total habitat for spotted owls in the Planning Area will increase to ~~59~~54 percent.

NRF habitat will decrease in the Planning Area from ~~30~~29 percent in 1996 to ~~28~~27 percent in 2016 and increase slightly during the final 30 years of the plan to ~~31~~29 percent. Similarly, FD habitat will decrease slightly in the first 2 decades, from ~~47~~18 percent in 1996 to ~~46~~15 percent in 2016, but will increase significantly to ~~28~~25 percent by 2045 (Table 4).

Under this alternative, it is expected that all suitable habitat within 1.8-mile circles below the 40 percent habitat thresholds values on Plum Creek land acquired in the land exchange and therefore outside the HCP area would be left intact around spotted owl sites. While difficult to quantify, Plum Creek might be able to defer harvest on HCP lands until they had completed harvest on non-HCP lands by either (1) removing all suitable habitat; (2) harvesting down to the threshold level; or (3) decertification of the owl circle through standard protocols. The analysis contained herein assumes that harvesting would occur without regard to such a strategy and is, therefore, based upon growth and harvest simulations and restrictions of State and Federal regulations. Under current stand conditions, NRF habitat on the majority of non-HCP lands would be restricted from harvest because overlapping owl circles are below the 40 percent threshold level.

To avoid inadvertent “take” of an unknown owl site, Plum Creek would continue to survey areas to document “absence” of owls prior to road construction and timber harvest. Habitat outside of the regulatory circles would be harvested and would become zones of non-habitat or fragmented habitat that may attract, but would not successfully support, dispersing juvenile or adult owls. Dispersal habitat would not be deployed as strategically on non-HCP lands in this alternative. Connectivity of NRF patches would be low on the areas with interspersed non-HCP lands, but would be higher in other areas as a result of the exchange. The remainder of lands held under the original HCP would continue under HCP management, but minimum NRF habitat levels would be adjusted to 6 percent during the lowest point and deferral acreage would be reduced.

As in the other alternatives, an important contribution of the land covered under the existing HCP to recovery of the spotted owl will be developing dispersal habitat to improve demographic interchange of spotted owls in the I-90 corridor.

Alternative 3 (Proposed Action). As displayed in Tables 4 and 5, total spotted owl habitat (NRF and FD) in the Planning Area will increase on Plum Creek lands and on Federal lands over the HCP period. Total habitat for spotted owls will decrease during the first 20 years of the plan, from 47 percent of the total Planning Area in 1996 to ~~42~~41 percent in 2016. For the following 30 years (i.e., 2016 through 2045) total habitat for spotted owls in the Planning Area will increase to ~~58~~53 percent.

NRF habitat will decline slightly in the Planning Area during the first 20 years from ~~30~~29 percent in 1996 to ~~27~~26 percent in 2016 and increase the final 30 years to 30 percent. Similarly, FD habitat will decrease slightly in the first 2 decades, from ~~17~~18 percent in 1996 to 15 percent in 2016, but will increase significantly to ~~28~~25 percent by 2045 (Table 3).

As in the No Action Alternative, an important contribution of the Proposed Action to recovery of the spotted owl will be developing dispersal habitat to improve demographic interchange of spotted owls in the I-90 corridor. Dispersal habitat will increase substantially over the HCP period. The “filling in” of dispersal habitat will occur between NRF habitat areas. Dispersal habitat will provide “stopover” and “resting” places where adults and juveniles would find suitable cover and foraging opportunities and reduced exposure to predators while dispersing. Dispersal habitat will link DCAs and will facilitate the movement and distribution of juvenile and adult spotted owls among and between NRF areas. In addition, in the post-land exchange landscape, more NRF and FD owl habitat will be under Federal management for the long-term benefit of owl demographics.

4.7.1.1.2.3 *Distribution and Patch Size of Habitat*

Alternative 1 (No Action). Areas with high concentrations of habitat today continue to provide habitat throughout the HCP period, especially in the late-successional reserve and adaptive management areas where the combined retention efforts of the Forest Service and the HCP are concentrated. The future distribution of NRF and FD habitats on Plum Creek lands covered under the HCP will facilitate spotted owl dispersal. Under the No Action Alternative, NRF habitat would be provided throughout the HCP period with a minimum of 9 percent on Plum Creek lands at the lowest point. An extensive system of RHAs will be maintained and although they will contain only a small portion of the FD and NRF habitat relative to the landscape, they will serve as “stepping stones” for dispersing owls. Eight percent of the NRF on Plum Creek lands is in RHAs, and this will increase over the HCP period. Thus, a significant portion of Plum Creek’s NRF habitat will remain in upland areas throughout the permit period.

The HCP provides biologically relevant sizes of forest patches for retention of and eventual regrowth of forest habitat. Although it is impossible to specify the exact size and location of each NRF patch on landscape for 50-100 years, management units on Plum Creek land within the Planning Area will range between 2 to 120 acres and average 42 acres. These represent a biological and operational compromise, facilitating both practical commercial forest-management activities and biologically relevant habitat patches. Where adjacent to other NRF and FD on Plum Creek or other ownerships, the effective patch size will be larger.

Alternative 2 (Partial HCP). Areas with high concentrations of habitat today continue to provide habitat throughout the HCP period, especially in the late-successional reserve and adaptive management areas where the combined retention efforts of the Forest Service and the HCP are concentrated. With the land exchange, the ability of some of these areas is enhanced. The future distribution of NRF and FD habitats on Plum Creek lands covered under the existing HCP will facilitate spotted owl dispersal. Plum Creek lands not covered by the HCP will not have RHAs or deferrals and may or may not facilitate spotted owl dispersal depending on the need to implement State rules and regulations. With the land exchange, patches of owl habitat will tend to be larger over the course of the HCP as a result of larger blocks of contiguous forest managed under late-successional reserve and adaptive management area standards. As a result of the smaller Plum Creek land ownership in the Planning Area post-land exchange, NRF habitat would be provided throughout the HCP period with a minimum of 6 percent on Plum Creek lands at the lowest point. No RHAs would be implemented on the ~~10,800~~ 10,200 acres of lands acquired by Plum Creek, resulting in potentially less habitat that may act as “stepping stones” in the future once the surrounding forest plantations regain canopy closure.

Alternative 3 (Proposed Action). Areas with high concentrations of habitat today continue to provide habitat throughout the HCP period, especially in the late-successional reserve and adaptive management areas where the combined retention efforts of the Forest Service and the HCP are concentrated. With the land exchange, the ability of some of these areas is enhanced. The future distribution of NRF and FD habitats on Plum Creek lands will facilitate spotted owl dispersal. Eight percent of the NRF on Plum Creek lands is in RHAs, and this will increase over the HCP period. Thus, a significant portion of Plum Creek’s NRF habitat will remain in upland areas throughout the HCP period. With the land exchange, patches of owl habitat will tend to be larger over the course of the HCP as a result of larger blocks of contiguous forest managed under late-successional reserve and adaptive management area standards.

4.7.1.1.2.4 *Carrying Capacity for Owls*

Alternative 1 (No Action). Within the Planning Area, RSPF estimated 88 pair sites in 1996, decreasing 6 percent to 82 mid-way through the HCP period and subsequently increasing to 86 pair sites by 2045. Based on these conservative estimates, implementation of the HCP would have minimal impacts on the long-term capacity of the landscape to support spotted owls. Demographic monitoring would continue in 10 to 15 percent of the Planning Area to validate the RSPF model and effectiveness of the deferrals.

The HCP will provide short and long-term support for existing spotted owl nest-site clusters in the Planning Area. NRF habitat deferrals were prioritized for existing nest-sites in cluster areas associated with the DCA’s. The dispersal corridors will link these sites to adjacent habitat found on Federal lands, as well as riparian habitat areas, and to cluster sites across I-90. Habitat retention and restoration in existing priority clusters will further reduce impacts of the HCP on spotted owls and achieve the conservation contributions of nonfederal lands recommended in the draft Northern Spotted Owl Recovery Plan (Lujan et al. 1992).

Alternative 2 (Partial HCP). Within the Planning Area, RSPF estimated 88 pair sites in 1996, 84 mid-way through the HCP period and subsequently increasing to 86 pair sites by 2045. Based on these conservative estimates, partial implementation of the HCP would have minimal impacts on the long-term capacity of the landscape to support spotted owls. Demographic monitoring would be adjusted, but would continue to cover 10 to 15 percent of the Planning Area.

With the land exchange, the pattern of Federal lands provides potential connectivity from north to south and as habitat develops on additional Federal lands north-south connectivity will be enhanced as a result of the land exchange, in conjunction with additional connectivity obtained as a result of the HCP, but at a lower level than under the proposed modification.

Alternative 3 (Proposed Action). Within the Planning Area, RSPF estimated 88 pair sites in 1996, 84 mid-way through the HCP period and subsequently increasing to 89 pair sites by 2045. Based on these conservative estimates, implementation of the Proposed Action would have minimal impacts on the long-term capacity of the landscape to support spotted owls. Demographic monitoring would be adjusted, but would continue to cover 10 to 15 percent of the Planning Area.

The HCP will provide short and long-term support for existing spotted owl nest-site clusters in the Planning Area. NRF habitat deferrals were prioritized for existing nest-sites in cluster areas associated with the DCA's. The dispersal corridors will link these sites to adjacent habitat found on Federal lands, as well as riparian habitat areas, and to cluster sites across I-90. Habitat retention and restoration in existing priority clusters will further reduce impacts of the HCP on spotted owls and achieve the conservation contributions of nonfederal lands recommended in the draft Northern Spotted Owl Recovery Plan (Lujan et al. 1992). With the HCP extended to the lands Plum Creek will acquire, the potential connectivity from north to south is increased in the Planning Area in addition to that resulting from the land exchange. As habitat develops on acquired and pre-exchange Federal lands, north-south connectivity will be further enhanced.

4.7.1.2 MARBLED MURRELET

The current potential for murrelet activity is very low to non-existent in the Planning Area due to the small amount of suitable habitat, poor habitat quality, and its apparent non-use by murrelets (Section 3.7). The lands being discussed are at the edge of the range of murrelets because they are located far from marine waters. The potential habitat being discussed appears to be of marginal quality based upon several site visits by murrelet experts. Murrelets have not yet been detected anywhere in the Green River Watershed. Consequently, impacts to murrelets as a result of implementation of any of the alternatives are expected to be minimal.

Suitable habitat is to be defined by the Services and Plum Creek before post-land exchange surveys are conducted. For comparative purposes, suitable habitat in Table 6 below was defined as west of the Cascade crest, excluded stands containing more than 50 percent basal area of true fir and mountain hemlock, excluded stands less than 5 acres, and met the criteria for Managed Old Growth and Old Growth (HCP Section 2.3).

Table 6. Acres of Marbled Murrelet Potentially Suitable Habitat by Alternative

<u>Ownership</u>	<u>Alternative 1</u>	<u>Alternatives 2 & 3</u>
Forest Service	4,930	3,360
Plum Creek	70	1,640
Other	<u>200</u>	<u>200</u>
TOTAL	5,200	5,200

Alternative 1 (No Action). Plum Creek Lands containing potential murrelet habitat have been surveyed. No murrelets were detected and all such lands are now available for harvest. Murrelets found in the future in the Green River are protected by seasonal restrictions, but future murrelet sites discovered on Plum Creek lands would be available for harvest outside the nesting season. Murrelet habitat on Forest Service lands would be retained and would be managed for the continued benefit of murrelets. Some edge effect is to be expected in areas where National Forest lands border private lands.

Alternative 2 (Partial HCP). Murrelet habitat in the Green River transferred to the Forest Service under this proposal and existing National Forest lands which would contain habitat in the future would not be harvested. Lands acquired by Plum Creek would be surveyed according to the State Forest Practices Rules and Regulations and Pacific Seabird Group standards protocols. Following surveys, these private lands would be available for harvest.

Alternative 3 (Proposed Action). The proposed action includes the creation of a more contiguous block of future habitat that would reduce edge effects and potentially benefit murrelets by reducing potential predation rates and windthrow associated with small isolated patches of habitat. Although slightly fewer acres of potential future habitat and some of the Forest Service acquired and retained acres are a lower quality growing site, benefits for the long-term provision of future functioning habitat will be realized should murrelets colonize or recolonize the Green River subbasin. Under the proposed action in the short term, about 2,100 acres of currently suitable or potentially suitable habitat would be incorporated into the HCP. Those lands determined by the Service to be “likely to contain murrelets” will be surveyed. Those lands determined by the Service to be “unlikely to be occupied” and those lands that have been surveyed without detecting murrelets would be available for timber harvest. Murrelet habitat that is transferred to the Forest Service under this proposal in the Green River and existing National Forest lands that would contain suitable habitat in the future would not be harvested.

4.7.1.3 GRIZZLY BEAR

Although grizzly bears may not currently reside in the Planning Area, Plum Creek realizes that they may immigrate and reside in the Planning Area during the HCP period. The HCP has used the best information available to assess habitat and analyze impacts. Improper timber management may affect grizzly bears by: (1) removing thermal, resting, and security cover; (2) displacing bears during timber harvesting operations; and (3) increasing human/grizzly bear confrontation potential or disturbance factors as a result of road building and management. The degree to which these alternatives facilitate recovery of grizzly bears in the I-90 Lakes Subunit, which is included in the North Cascades Recovery Zone, is also assessed.

Alternative 1 (No Action). Implementation of the No Action Alternative would result in a series of bear protecting BMPs by Plum Creek in the I-90 Lakes Subunit, a portion of the North Cascades Recovery Zone. These BMPs would restrict and reclaim excessive open-road densities (i.e., roads open to casual public use), implement seasonal restrictions on forest operations in preferred habitat areas where bears likely occur, and restrict firearm use by company employees and contractors. These measures would reduce disturbances to bears.

In addition, implementation of the No Action Alternative would retain screening cover in riparian areas and wetlands, important foraging areas for grizzly bears. An important aspect of the HCP is that some mitigation efforts will be implemented immediately to provide security habitat for bears and other mitigation efforts would be implemented upon confirmation of actual use by resident bears. These measures would further minimize incidental “take.”

By implementing Environmental Principles, including road closures, and establishing RHAs, the HCP would have a net positive effect on grizzly bears over existing conditions. Properly managed harvesting operations can result in an increase in bear foods (e.g., forbs, berries, and grasses) through silvicultural manipulation (e.g., tree removal, riparian management, prescribed burning)(USFWS 1993). Timber harvest provides additional foraging opportunities over time, while not limiting the availability of hiding cover. In the absence of a natural fire regime, timber harvest may be an important dynamic for foraging habitat. Consequently, implementation of the HCP will be beneficial for grizzly bears. Table 27 of the HCP shows grizzly bear habitat conditions estimated for security areas within the I-90 Lakes Subunit during the HCP period. It shows a decline in foraging/prey habitat from 15 percent of the area in 1996 to 4 percent in 2045, and an increase in hiding/thermal habitat from 63 percent of the area in 1996 to 74 percent of the area in 2045. These changes reflect the general decline in early-successional habitat (favorable to prey species) and its replacement with mid- to late-successional forests. Because of the reduction in road density, it is expected that the amount of security habitat available will increase and thereby increase foraging/prey and hiding/thermal habitats beyond the amounts estimated.

Alternative 2 (Partial HCP) and Alternative 3 (Proposed Action). In these alternatives, Plum Creek would exchange much of its lands in the Recovery Zone to the Forest Service. Lack of timber harvest by the Forest Service would alter the amount of foraging habitat and hiding cover. In the two action alternatives, Plum Creek would manage only small portions of the Recovery Zone in the Planning Area and much of this at the southern extreme near the Interstate-90 corridor and in proximity to areas deemed undesirable for grizzlies. Under the Partial HCP alternative, lands acquired by Plum Creek inside the Recovery Zone would be managed according to the State Forest Practices rules and regulations. Under the Proposed Action alternative, lands acquired by Plum Creek inside the Recovery Zone would be managed according to the HCP (see No Action alternative discussion above). The Forest Service would manage the vast majority of this area and would have a greater role in determining the fate of grizzly bears in this area through the management and decommissioning of roads and the regulation of fire-management and timber-management activities.

Under all alternatives, management actions would accommodate the needs of grizzly bears. While the HCP would govern Plum Creek’s contribution to grizzly bear long-term survival in the Recovery Zone. Section 7(a)(1) of the ESA would govern the actions of the Forest Service in furthering the conservation of the species. While Forest Service management is less certain than the actions prescribed by the HCP, there is continued ability to adjust to the needs of the species in the future.

4.7.1.4 GRAY WOLF

Gray wolves are not known to currently reside in the Planning Area, although several sightings suggest that transient wolves may have used the area in recent times. Despite the fact that no Federal recovery area has been designated for the gray wolf in the Planning Area, Plum Creek recognizes the likelihood that wolves may establish residency in the Planning Area during the HCP period.

Alternative 1 (No Action). Under the No Action Alternative, the HCP will manage habitat for prey species such as deer and elk, prioritize road closures in priority areas and where possible wolf sightings have occurred to protect big game prey, and help prevent malicious shootings. Should den sites be detected during the HCP period, restrictions on operations around den sites would be implemented. BMPs implemented for grizzly bears will also benefit wolves. Therefore, implementation of the HCP will be beneficial for the gray wolves if, or when, they occur in the Planning Area.

Alternative 2 (Partial HCP) and Alternative 3 (Proposed Action). In both the Proposed Action and Partial HCP, Plum Creek would manage far fewer lands in the Grizzly Bear Recovery Zone and in key areas south of I-90 such as the Taneum. The Forest Service would obtain lands that allow them greater control of large areas and ability to manage for wide-ranging carnivores such as the gray wolf. Under both action alternatives, Plum Creek's ownership shifts from these important areas, to areas of less importance to wolves. This shift results in greater ownership and control by the Forest Service in these areas important to wolf conservation. It is expected that the management to occur under the NWFP will benefit wolves if roads are reduced and disturbances such as fire are allowed to create foraging habitat for ungulates (e.g., deer and elk). The foraging habitat and edge habitats created by Plum Creek timber harvest which support ungulates will no longer occur in these areas and so will no longer contribute to providing ungulates for prey.

4.7.2 SPECIAL EMPHASIS SPECIES

This section considers the impacts of the alternatives on 17 Special Emphasis Species of wildlife. Additional detail on life-history requirements, distribution in the Planning Area and management considerations can be found in the HCP and in Lundquist et al. (1995). The section below discusses potential impacts on two of the Special Emphasis Species. Other Special Emphasis Species are addressed under the Lifeform in which the species is placed. Section 4.7.4 addresses impacts on Lifeforms.

4.7.2.1 LARCH MOUNTAIN SALAMANDER

Larch Mountain salamanders have been documented on shaded, moss-covered talus in the Planning Area, and are also known to occur in late-successional-forest stands associated with piles of bark slabs around large trees. The species is terrestrial and has almost never been associated with open water. It is important to note that the Larch Mountain salamander is associated with cool, moist, talus slopes under a tree canopy. Such talus slopes are only a small portion of the Planning Area. Most talus slopes are steep, dry rock piles. The Larch Mountain salamander is in Lifeform 4.

Alternative 1 (No Action). Four of the seven known sites in the Planning Area would occur on Plum Creek, two would occur on National Forest lands, and one would occur on lands covered by the DNR HCP. With implementation of the No Action Alternative, suitable habitat would be the same as depicted in Table

7 for Lifeform 4. Suitable habitat would change from 51 percent to 53 percent. Timbered stands (i.e., PT to OG) around talus slopes on Plum Creek land will change (50 percent in 1996 to 53 percent in 2045, Table 7). However, retention of buffers, including larger trees, within 100 feet of talus areas, restrictions on site disturbance from log skidding and heavy equipment, and RHAs will retain habitat components near areas of known or suspected use. Consequently, the HCP addresses the needs of this species in excess of State regulations.

Alternative 2 (Partial HCP) and Alternative 3 (Proposed Action). Three of the seven known sites in the Planning Area would occur on Plum Creek and three would occur on National Forest lands as a result of the land exchange for each of these alternatives. One site would remain on State DNR lands. Under the Partial HCP alternative, one site acquired by Plum Creek and some unknown amount of potential sites would not be incorporated into the HCP. Acquired areas that could potentially harbor Larch Mountain salamanders would receive the protections associated with implementation under State forest practices regulations which do not require any buffers along talus slopes and allow roading and mining of talus slopes. Some sites will likely not receive protection and be subject to unknown impacts. With current information, the loss of even a few sites might severely impact this rare species.

Under the Proposed Action alternative, areas acquired by Plum Creek that could potentially harbor Larch Mountain salamanders would receive the protections outlined in the HCP. Talus slopes are buffered from timber harvest and protected from unrestricted roading and mining under the Proposed Action alternative. Under both Action alternatives, areas acquired by the Forest Service would receive the protections of the NWFP. Changes in suitable habitat for this species for each of these action alternatives can be found in Table 7.

4.7.2.2 NORTHERN GOSHAWK

A total of 19 goshawk site centers are known in the Planning Area, based on historical observations and recent survey data. Six of these site centers are on Plum Creek land. One new site has been discovered on National Forest lands since the HCP was signed in 1996. Additional monitoring of existing sites has occurred. The goshawk is in Lifeform 11.

Alternative 1 (No Action). Plum Creek would continue deferrals on six sites and the Forest Service would retain nest sites for 13 known goshawk sites. Habitat amounts would be consistent with those described in Table 7 for Lifeform 11. Suitable habitat would increase from 72 percent in 1996 to 81 percent in 2045.

Alternative 2 (Partial HCP). Plum Creek would retain deferrals on one goshawk site and five sites would be transferred to the Forest Service. No goshawk sites would occur on the lands newly acquired by Plum Creek which would be managed under State Forest Practice Rules and Regulations. Current state regulations do not provide any timing or harvest restrictions near active goshawk nest sites, therefore, non-HCP lands will not be managed to avoid disturbance of goshawk nest sites found on those lands or on adjacent lands. Goshawks apparently occur in greater densities on the east side of the Cascade crest so the majority of unknown sites will likely benefit from the exchange. Conversely, since fewer goshawk sites are expected on the west side, the different effects expected to occur under the HCP in comparison to State Forest Practices Rules and Regulations will matter less to unknown goshawk sites. Habitat amounts would be consistent with those described in Table 7 for Lifeform 11. Suitable habitat would increase from 72 percent in 1996 to 83 percent in 2045.

Alternative 3 (Proposed Action). Plum Creek would retain deferrals on one goshawk site and five sites would be transferred to the Forest Service. Future active goshawk nests found on newly acquired Plum Creek land or adjacent areas would be protected by a 0.25-mile no disturbance zone during the breeding season. Plum Creek would consider experimental silvicultural treatments surrounding the nest site to maintain its viability. Habitat amounts would be consistent with those described in Table 7 for Lifeform 11. Suitable habitat would increase from 72 percent in 1996 to 83 percent in 2045. Both action alternatives provide larger contiguous areas in Forest Service management as a result of the land exchange, which should benefit the goshawk given our current level of understanding of this species and its apparent need for large blocks of mature forest.

4.7.3 SPECIES OF CONCERN

This section discusses the potential impacts from implementation of the alternatives on one species of concern, the bald eagle. Other Species of Concern are addressed under the Lifeform in which the species is placed. Section 4.7.4 addresses impacts on Lifeforms.

4.7.3.1 BALD EAGLE

The single known nest site in the Planning Area occurs on Forest Service ownership in proximity to Plum Creek ownership. No additional information has become available on bald eagle use of the Planning Area since 1996. None of the alternatives are expected to result in effects that are substantially different from one another with respect to bald eagles. Each of the alternatives still provide benefits beyond what would be expected to occur under State Forest Practices Rules and Regulations in the absence of the HCP.

Alternative 1 (No Action). Plum Creek ownership adjacent to future nest sites would be managed consistently with a nest-site management plan according to the HCP. Roost and foraging disturbance provisions would continue. Protection of riparian habitats by the HCP and NWFP would help maintain a prey base.

Alternative 2 (Partial HCP) and Alternative 3 (Proposed Action). Plum Creek lands adjacent to the single currently known nest site along Cle Elum Lake would be transferred to Forest Service ownership as a result of the land exchange and be managed under the NWFP. Under both action alternatives as a result of the land exchange, Plum Creek would have substantially less habitat along lakes and major rivers on the east side of the Cascades Crest. Under the Partial HCP Alternative, lands acquired by Plum Creek will be managed according to State regulations. Management under State Forest Practices Rules and Regulations may not effect bald eagles substantially with the exception of the negative impacts expected to result to salmonids. However, on westside Cascades Plum Creek acquired lands, anadromous salmonids are less likely to be impacted in the Green River subbasin due to fish passage blockages. Plum Creek lands not managed according to the HCP under the Partial HCP Alternative would comprise only a minor portion of the landscape, especially in areas most likely to be used by wintering or nesting eagles. Under the Proposed Action Alternative, roost and foraging disturbance provisions would be implemented to future bald eagle sites on Plum Creek acquired lands in the Planning Area per the HCP.

4.7.4 ASSOCIATED SPECIES

The effects of the alternatives on the remaining wildlife species not discussed earlier in this document, expected or known to occur in the Planning Area, were evaluated using grouped assemblages or Lifeforms (see Section 3.7.5.1 in this document). All habitat figures in this analysis refer to the combination of all ownerships in the Planning Area. The discussion of habitat on a single ownership would not be biologically relevant to the species comprising these Lifeforms. In this respect, the analysis below also represents an assessment of the cumulative impacts. The HCP describes commitments made on Plum Creek ownership and is incorporated herein by reference. Additional information with regard to the No Action Alternative's effects on these Lifeforms can be found in the Service's Biological Opinion (FWS 1996) or the Unlisted Species Assessment (FWS 1996).

Current habitat information was based primarily on recent inventory data from multiple ownerships. Growth-and-yield data were available on most ownerships and were interpolated where absent. A standard forestry model, OPTIONS, was used to "future" habitats through simulated growth and harvests. Projected harvest treatments were based on the best available and conservative assumptions for other ownerships. OPTIONS outputs were aggregated and analyzed using GIS for each decade until year 50. Current conditions and likely management scenarios indicate that mature forest with structure and healthy riparian conditions will either continue to improve from year 50 to 100 or, as a worst-case scenario, would remain the same.

In comparing alternatives, two spatial scales of effects should be considered. Landscape effects will differ between the No Action and both action alternatives (Proposed Action and Partial HCP) due to the transfer of ownership and blocking of National Forest lands. The consolidation into larger blocks of lands the National Forest will acquire and manage according to the NWFP will confer in general greater benefits to all Lifeforms under the action alternatives. These larger blocks of land managed according to adaptive management area and late successional reserve guidelines will benefit species that are associated with interior forest conditions and infrequent human disturbance and a more late-successional habitat-connected landscape. These benefits are generally associated with those species that are more wide-ranging or have larger home ranges. A landscape with larger blocks and connective corridors may also benefit localized populations where they occur in these blocks and corridors and ensure their long-term viability. For these reasons and as a result of the land exchange, it is assumed that each Lifeform will benefit under either action alternative compared to the No Action Alternative.

On a smaller spatial scale, site-specific effects will differ between the Proposed Action and Partial HCP Alternatives due to whether HCP guidelines and prescriptions or State regulations are implemented on the ~~10,800~~10,200 acres Plum Creek will acquire. For example, prescriptions such as riparian buffers on perennial streams, cave and talus slope protections, and research and monitoring would not occur on Plum Creek acquired lands under the Partial HCP Alternative. Site-specific protection measures may be important for those species with rare or widely distributed local populations to ensure their continued viability in a larger landscape. The following section will describe the different management scenarios and resulting site-specific differences between the two action alternatives. Lifeform 1 includes fish that are addressed in Section 4.8.

The percentage of suitable habitat in the Planning Area for each Lifeform is given by alternative in Table 7. The 1996 values depicted in the table are the existing conditions for the land exchange and HCP

alternatives. For most Lifeforms, suitable habitat is defined as the amount of primary habitat and one half the amount of secondary habitat.

4.7.4.1 LIFEFORM 1 (SEE SECTION 4.8 FISH)

4.7.4.2 LIFEFORM 2

Species in Lifeform 2 include frogs (including the Special Emphasis Species: tailed frog, northern red-legged frog, Cascades frog, and Oregon spotted frog) and most salamanders. For purposes of analysis, primary habitat for this Lifeform was considered to be areas in riparian and wet sites occurring in later structural stages (DRF through OG), and secondary habitat was those areas occurring in the younger structural stages. Lifeform 2 species are associated mainly with aquatic habitats for breeding, rather than specific forest structural stages, but maintenance of the later structural stages adjacent to the aquatic habitats may help maintain optimum conditions (e.g., shade, water temperature, water clarity, and aquatic productivity).

Alternative 1 (No Action). ~~Changes in habitat amounts during the Permit period are presented in Table 7.~~ Suitable habitat will show an increasing trend during the 50-year HCP period. The increasing trend is due to implementation of the HCP and ~~NWFP~~ **amended Forest Plans**. The increase/improvement in habitat for these species is primarily due to the planned reduction in harvest activities near streams and wetlands on both Plum Creek and National Forest lands during the HCP period. Protection of riparian corridors with buffers and accelerated watershed analysis would limit adverse impacts to these species from siltation of stream habitat or other water-quality effects. The forested cover within the riparian buffers would continue to act as a source of large woody debris for in-stream and terrestrial habitat elements for species such as amphibians. To the extent that nonfish-bearing streams may be particularly important to amphibians, the 100-foot RHAs will be of particular benefit to these species. Wetland buffers will be particularly large and robust surrounding the larger (greater than 5 acres), more complex wetlands. Leave trees in these wetland buffers will be representative of the size of the pre-harvest stand. Forested wetlands will be retained in a forested condition (e.g., 30 percent canopy coverage). Additionally, RLTA's, harvest-unit leave trees, the Environmental Principles, and accelerated watershed analysis should address many of the remaining smaller streams that would not otherwise receive an RHA. Overall, habitat would exceed that provided without an HCP.

The percentage of suitable habitat in the Planning Area for each Lifeform is given by alternative in Table 7. The 1996 values depicted in the table are the existing conditions for the land exchange and HCP alternatives. For most Lifeforms, suitable habitat is defined as the amount of primary habitat and one half the amount of secondary habitat.

Table 7. Estimated Area for Lifeforms by Decade, by Alternative (Percent). Refer to Table 17 in DEIS.

Table 7	1996	2006	2016	2026	2036	2045
LIFEFORM 2 (frogs and salamanders)						
Suitable Habitat						
No Action	76	77	79	80	81	82
Partial HCP	75	75	77	79	80	81
Proposed Action	75	76	78	79	81	81
Primary Habitat						
No Action	66	67	71	73	76	77
Partial HCP	65	64	68	72	75	76
Proposed Action	64	65	69	72	76	76
LIFEFORM 3 (turtles and ducks)						
Suitable Habitat						
No Action	76	77	79	80	81	82
Partial HCP	75	75	77	79	80	81
Proposed Action	75	76	78	79	81	81
Primary Habitat						
No Action	66	67	71	73	76	77
Partial HCP	65	64	68	72	75	76
Proposed Action	64	65	69	72	76	76
LIFEFORM 4 (falcons and goats)						
Suitable Habitat						
No Action	53	50	51	53	54	54
Partial HCP	53	51	53	53	52	53
Proposed Action	49	46	48	52	52	53
Primary Habitat						
No Action	49	44	45	50	52	52
Partial HCP	49	45	49	53	52	53
Proposed Action	49	46	48	52	52	53
LIFEFORM 5 (grouse, hares, deer, elk, etc.)						
Suitable Habitat						
No Action	88	92	89	83	74	68
Partial HCP	88	89	85	79	73	69
Proposed Action	88	89	85	81	75	71
LIFEFORM 6 (warblers, porcupines)						
Suitable Habitat						
No Action	52	50	48	47	46	45
Partial HCP	51	50	47	47	46	45
Proposed Action	53	51	48	47	46	45
Primary Habitat						
No Action	17	15	9	8	6	4
Partial HCP	17	15	9	8	6	4
Proposed Action	19	15	9	8	6	4
LIFEFORM 7 (sparrows, blackbirds, thrushes)						

Table 7	1996	2006	2016	2026	2036	2045
Suitable Habitat						
No Action	55	54	56	55	54	52
Partial HCP	56	56	57	55	54	53
Proposed Action	57	56	57	57	55	54
Primary Habitat						
No Action	24	22	25	23	21	18
Partial HCP	26	26	28	25	23	20
Proposed Action	28	26	28	27	24	22
LIFEFORM 8 (warblers, flycatchers)						
Suitable Habitat						
No Action	53	55	58	56	53	50
Partial HCP	53	56	59	56	53	50
Proposed Action	53	56	60	57	54	51
Primary Habitat						
No Action	27	30	33	27	22	17
Partial HCP	27	31	34	27	21	16
Proposed Action	27	32	35	28	22	17
LIFEFORM 9 (waxwings, grosbeaks)						
Suitable Habitat						
No Action	51	50	54	55	54	52
Partial HCP	52	52	55	55	54	53
Proposed Action	52	53	55	57	55	54
Primary Habitat						
No Action	23	21	23	23	21	18
Partial HCP	25	25	26	25	23	20
Proposed Action	226	25	26	27	24	22
LIFEFORM 10 (squirrels, tanagers, warblers)						
Suitable Habitat						
No Action	68	67	74	78	79	78
Partial HCP	68	68	75	79	80	80
Proposed Action	68	68	75	79	81	81
Primary Habitat						
No Action	57	55	64	72	75	74
Partial HCP	57	55	65	73	76	76
Proposed Action	57	55	65	72	77	77
LIFEFORM 11 (vireos, hawks, flycatchers)						
Suitable Habitat						
No Action	72	71	76	80	81	81
Partial HCP	72	71	76	80	82	82
Proposed Action	72	71	76	80	82	82
Primary Habitat						
No Action	57	55	64	72	75	74
Partial HCP	57	55	65	73	76	76
Proposed Action	57	55	65	72	77	77
LIFEFORM 12 (herons, osprey, great horned owl)						
Suitable Habitat						

Environmental Consequences

Table 7	1996	2006	2016	2026	2036	2045
No Action	68	70	74	76	78	80
Partial HCP	67	67	72	75	77	79
Proposed Action	66	68	73	75	78	79
Primary Habitat						
No Action	66	67	71	73	76	77
Partial HCP	65	64	68	72	75	76
Proposed Action	64	65	69	72	76	76
LIFEFORM 13 (Woodpecker, nuthatch)						
Suitable Habitat						
No Action	64	61	65	70	72	72
Partial HCP	64	62	66	71	73	74
Proposed Action	64	61	66	70	74	75
Primary Habitat						
No Action	52	49	50	57	61	65
Partial HCP	52	49	50	58	63	67
Proposed Action	52	48	50	57	63	67
LIFEFORM 13a (woodpecker)						
Suitable Habitat						
No Action	46	51	60	62	62	62
Partial HCP	46	51	60	63	64	64
Proposed Action	46	50	60	62	64	64
Primary Habitat						
No Action	39	39	39	41	42	44
Partial HCP	39	40	39	42	44	46
Proposed Action	39	38	39	41	43	46
LIFEFORM 14 (owls, bluebirds)						
Suitable Habitat						
No Action	70	68	69	72	74	76
Partial HCP	70	68	69	73	75	77
Proposed Action	70	68	69	72	75	77
Primary Habitat						
No Action	52	49	50	57	61	65
Partial HCP	52	49	50	58	63	67
Proposed Action	52	48	50	57	63	67
LIFEFORM 14a (bats, owl, fisher)						
Suitable Habitat						
No Action	46	44	45	49	52	55
Partial HCP	46	45	45	50	54	57
Proposed Action	46	43	45	49	53	57
Primary Habitat						
No Action	39	39	39	41	42	44
Partial HCP	39	40	39	42	44	46
Proposed Action	39	38	39	41	46	46
LIFEFORM 15 Early (shrews, bears, voles)						
Suitable Habitat						
No Action	30	32	23	15	12	13

Table 7	1996	2006	2016	2026	2036	2045
Partial HCP	30	32	22	14	11	11
Proposed Action	30	32	22	15	10	10
LIFEFORM 15 Mid (owls, bluebirds)						
Suitable Habitat						
No Action	18	16	25	31	33	30
Partial HCP	18	15	26	31	32	30
Proposed Action	18	17	26	31	34	31
LIFEFORM 15 Late (shrews, bears, voles)						
Suitable Habitat						
No Action	39	39	39	41	42	44
Partial HCP	39	40	39	42	44	46
Proposed Action	38	39	39	41	42	46
LIFEFORM 16 (kingfisher, otters)						
Suitable Habitat						
No Action	76	77	79	80	81	82
Partial HCP	75	75	77	79	80	81
Proposed Action	75	76	78	79	81	81
Primary Habitat						
No Action	66	67	71	73	76	77
Partial HCP	65	64	68	72	75	76
Proposed Action	64	65	69	72	76	76

No-Action Alternative = No Land Exchange, Current HCP
Proposed Action = Land Exchange, HCP for all Plum Creek land

4.7.4.3 — LIFEFORM 2

~~Species in Lifeform 2 include frogs (including the Special Emphasis Species: tailed frog, northern red-legged frog, Cascades frog, and Oregon spotted frog) and most salamanders. For purposes of analysis, primary habitat for this Lifeform was considered to be areas in riparian and wet sites occurring in later structural stages (DR through OG), and secondary habitat was those areas occurring in the younger structural stages. Lifeform 2 species are associated mainly with aquatic habitats for breeding, rather than specific forest structural stages, but maintenance of the later structural stages adjacent to the aquatic habitats may help maintain optimum conditions (e.g., shade, water temperature, water clarity, and aquatic productivity).~~

Alternative 1 (No Action). ~~Changes in habitat amounts during the Permit period are presented in Table 7. Suitable habitat will show an increasing trend during the 50 year HCP period. The increasing trend is due to implementation of the HCP and NWFP. The increase/improvement in habitat for these species is primarily due to the planned reduction in harvest activities near streams and wetlands on both Plum Creek and National Forest lands during the HCP period. Protection of riparian corridors with buffers and accelerated watershed analysis would limit adverse impacts to these species from siltation of stream habitat or other water quality effects. The forested cover within the riparian buffers would continue to act as a source of large woody debris for in-stream and terrestrial habitat elements for species such as amphibians. To the extent that nonfish bearing streams may be particularly important to amphibians, the 100 foot RHAs will be of particular benefit to these species. Wetland buffers will be particularly large and robust~~

surrounding the larger (greater than 5 acres), more complex wetlands. Leave trees in these wetland buffers will be representative of the size of the pre harvest stand. Forested wetlands will be retained in a forested condition (e.g., 30 percent canopy coverage). Additionally, RLTA's, harvest unit leave trees, the Environmental Principles, and accelerated watershed analysis should address many of the remaining smaller streams that would not otherwise receive an RHA. Overall, habitat would exceed that provided without an HCP.

Alternative 2 (Partial HCP). ~~Changes in habitat amounts during the Permit period are presented in Table 7.~~ Localized impacts to species in Lifeform 2 may result in the Partial HCP alternative due to site-specific measures not being implemented on ~~40,800~~10,200 acres Plum Creek will acquire. These lands would be instead treated according to State Forest Practices Rules and Regulations. Nonfish-bearing streams that are important to stream-breeding amphibians (e.g., tailed frog) would not receive protection without the HCP. Amphibians in these areas would be potentially subject to direct mortality, compression of interstitial spaces, removal of coarse woody debris, and indirect effects of solar radiation and fluctuations in microclimate as a result of implementation of minimum State regulations. Non-HCP lands would not receive the 30-foot ground-equipment exclusion zone within the 100-foot RHA and may receive no buffer at all. Removal of the dense vegetation near the waters edge and removal of the source of downed woody debris could impact species such as the northern red-legged frog. Nonfish-bearing buffers, when sufficiently robust, can serve as refugia for future colonization of adjacent upland areas for terrestrial members of this Lifeform such as the northwestern salamander; however, without the HCP, there may be no refugia from which to colonize future upland stands. As these non-HCP perennial streams are harvested, there would also be downstream effects that could impact additional members of this Lifeform (Lifeform 2) associated with fishbearing streams, such as the Pacific Giant Salamander. Lakes will be protected by establishing buffers as specified by Standard Forest Practice Rules and Regulations and should be adequate for the subject species in Lifeform 2; however, special habitats such as mineral springs, seeps, and forested wetlands would not be protected on the non-HCP lands. Fish-bearing streams would receive minimal buffers of 25-50 feet comprised of relatively fewer and smaller trees than provided by either the NWFP or the HCP. Perennial nonfish-bearing streams and seasonal streams would generally not receive buffers. It is likely however, because of the interspersed of the newly acquired lands with existing HCP lands, that the newly acquired lands would receive the benefits of accelerated watershed analysis from implementation of the HCP which would place additional buffers on smaller streams in excess of standard forest practices regulations. Additionally, should these lands be constrained by State and Federal regulations pertaining to the northern spotted owl, areas adjacent to some small streams may receive "de facto" buffering.

Alternative 3 (Proposed Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Plum Creek's HCP guidelines and mitigation measures would be applied to all ~~40,800~~10,200 acres acquired by Plum Creek. This protection would provide site-specific measures as outlined under the No Action Alternative above and would benefit species in this Lifeform that are associated with riparian areas, wetlands, spring and seeps. A greater number of small streams are afforded riparian buffers under this alternative compared to the Partial HCP Alternative, especially nonfish-bearing perennial types, which may be particularly important for amphibians.

4.7.4.3 LIFEFORM 3

Species in Lifeform 3 include turtles, some reptiles, waterfowl, shorebirds, and some passerines. Lifeform 3 includes one Special Emphasis Species (i.e., harlequin duck) and two Species of Concern (i.e., western pond turtle and black tern). Availability of suitable habitat for species in Lifeform 3 through the first 50-years of the HCP period was analyzed in the same way as for species in Lifeform 2. Species in this group breed on the ground around water and feed on the ground in shrubs, trees, or water. Primary habitat is similar to Lifeform 2 in that it is generally the more mature forest stages along riparian and wetland areas.

Alternative 1 (No Action). ~~Changes in habitat amounts during the HCP period are presented in Table 7.~~ Suitable habitat will show an increasing trend during the 50-year HCP period. The increasing trend is due to implementation of the HCP and ~~NWFP~~ [the amended Forest Plans](#). With implementation of the HCP, habitat conditions for Lifeform 3 will improve as forest structural classes along streams and wetlands advance to more-complex conditions. The increase/improvement in habitat for these species is primarily due to the planned reduction in harvest activities near streams and wetlands on both Plum Creek and National Forest System lands during the HCP period. The forested cover within the riparian buffers would continue to act as a source of large woody debris. Overall, no adverse impacts to Lifeform 3 would be expected for the Planning Area, and habitat for this Lifeform would exceed that provided in the absence of an HCP.

Alternative 2 (Partial HCP). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Suitable and primary habitat amounts will be similar to those described in the No Action Alternative because the majority of the lands would be managed under the Plum Creek HCP, ~~NWFP~~ [the amended Forest Plans](#), and the DNR HCP. However, in this alternative, the newly acquired Plum Creek lands would be treated according to State Forest Practices Rules and Regulations and localized effects to species in this Lifeform may occur. Fish-bearing streams on Plum Creek acquired lands would receive minimal buffers and perennial nonfish-bearing streams and seasonal streams would generally not receive buffers. Without the HCP, narrower buffers on streams could impact species such as waterfowl in this Lifeform by failing to provide coarse wood and nesting cover and protection from disturbance. It is likely however, because of the interspersed nature of the newly acquired lands with existing HCP lands, that the newly acquired lands would receive the benefits of accelerated watershed analysis from implementation of the HCP which would place additional buffers on smaller streams in excess of standard forest practices regulations. Additionally, should these lands be constrained by State and Federal regulations pertaining to the northern spotted owl, areas adjacent to some small streams may receive “de facto” buffering.

Alternative 3 (Proposed Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Plum Creek’s HCP guidelines and mitigation measures would be applied to all ~~10,800~~ [10,200](#) acres acquired by Plum Creek. This protection would provide site-specific measures such as riparian buffers on fishbearing and perennial nonfish-bearing streams, larger buffers on wetlands greater than five acres in size, and maintaining forest cover in forested. For instance, common loons would be expected to inhabit the larger bodies of water during the spring and summer breeding months. Protection of large, open-water habitats in the Planning Area with 200-foot buffers will provide visual screening of nesting areas and measures to maximize protection of stream fish habitat and water quality will benefit food resources such as fish. Impacts to these species on all ownerships is more likely to occur from human disturbance of potential nesting areas by recreational activities (e.g., boating, fishing, camping). Harlequin ducks are

generally found along fast-moving mountain streams where they nest on the ground or in holes in cliffs or trees, often using coarse woody debris or dense undergrowth for nesting cover. Provision for 100- to 200-foot RHAs (with 30-foot, no-harvest zones on fish-bearing streams, and 30-foot, no-equipment zones on nonfish-bearing streams) along perennial streams on Plum Creek's lands in the Planning Areas with retention of snags and large, old trees adjacent to streams will provide adequate loafing and nesting sites for these ducks. In addition, reduced harvesting in riparian areas and reductions in siltation, to protect prey items such as macroinvertebrates, will provide conservation benefits on HCP.

4.7.4.4 LIFEFORM 4

Species in this Lifeform include the Larch Mountain salamander and Townsend's big-eared bat (Special Emphasis Species), golden eagle and peregrine falcon (Species of Concern), mountain goats, and mountain lion. The search area for habitat for this Lifeform was a quarter mile surrounding inventory polygons containing substantial rock and talus. Primary habitat for this Lifeform (breeding in rocks and talus) was analyzed as the percentage of the area occurring as canopied forest (pole-timber through old-growth). The percentage containing earlier structural stages was considered secondary habitat. Because a number of the species use a variety of structural stages as primary habitat, whereas, other species use mainly non-forested rock and cliff areas, the potential impacts of the HCP on these species is highly variable.

Alternative 1 (No Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ The 100-foot buffers around talus areas in the HCP would protect this Lifeform on Plum Creek lands. Retention of large trees within 100 feet at the time of regeneration harvest will provide shade and future coarse woody debris for adjacent talus areas. Should a cave be discovered within the Planning Area, the Service would be notified, and would be responsible for mapping the cave and cave passages, recommending prescriptions to avoid compromising the integrity of those passages, and identifying other key concerns. A buffer will be established based on site-specific considerations but will not be less than 100 feet from the cave entrance. This buffer will be managed to the same foraging and dispersal standards as the riparian buffers. Locations of caves will not be divulged to the public to ensure the confidentiality that will reduce disturbance.

Alternative 2 (Partial HCP). ~~Changes in habitat during the HCP period are presented in Table 7.~~ HCP guidelines and mitigation measures would not be implemented on the ~~40,800~~ 10,200 acres Plum Creek would acquire. Caves and talus slopes are not regulated or protected by State Forest Practices Rules and Regulations and therefore, no site-specific protection would be afforded to the newly acquired Plum Creek lands containing talus and cliffs. Talus areas would not receive shading and a source of downed wood, cave entrances would not be buffered, and additional impacts may occur from rock extraction or road construction. However, while these impacts might be locally severe, they would only impact a minor proportion of lands within the Planning Area under any of the alternatives. On the other hand, because some of these special habitat types (i.e., caves) are so rare in this landscape, lack of protection on any lands could result in serious impacts to certain species. Cave species are sometimes only known to occur in one or a few caves.

Alternative 3 (Proposed Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ HCP guidelines for restricting operations and retaining forest habitat around talus slopes and caves (HCP Section 3.4.2) will reduce localized impacts on species in this Lifeform on the ~~40,800~~ 10,200 acres Plum Creek would acquire. Measures to maintain the integrity of these areas by retaining green trees and snags in close proximity will allow these areas to continue functioning as denning and loafing areas. Cliff, rock

outcrops, and steep rocky slopes typically restrict harvesting because of safety considerations for logging personnel or timber removal difficulties and are often excluded from harvest units. The retention of forested cover adjacent, among, and between these areas will benefit species such as mountain goats by maintaining foraging and cover conditions. Retention of patches of trees and residual larger trees within 100 feet of talus areas and restrictions on site disturbance from log skidding and heavy equipment will retain habitat components for species in Lifeform 4. Steps taken in the HCP as well as those steps taken under the NWFPP and DNR HCP to protect cave security and restrict public access should provide benefits to these species.

4.7.4.5 LIFEFORM 5

Species in Lifeform 5 include several reptiles, grouse, quail, larks and other birds, elk, deer, lynx ([currently proposed for inclusion on the permit](#)), and hares, among others. This Lifeform contains the California wolverine, a Special Emphasis Species. A number of the species in Lifeform 5 tend to use edges between cover and forage habitats. For purposes of analysis, a 0.5-mile “moving window” analysis was performed across the entire Planning Area using the stand-structural databases to quantify the number of analysis units containing two groups of stages: “forage,” made up of any of the first three structural stages (stand initiation, shrub saplings, or young forest); and “cover,” comprised of the later structural stages (pole-timber through old-growth). If a “window” contained both a forage and a cover structural class, then it was counted. The number of “windows” meeting these criteria was then tracked over the HCP period across the Planning Area. This analysis provides an indication of the suitability of habitats in the Planning Area over time.

Alternative 1 (No Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Under all alternatives, the decreasing trend in the Planning Area is due to the reduction of edge habitat on National Forest lands from a conscious effort to provide larger blocks of mature forest. The reduction in edge habitat across all alternatives would reduce the potential suitability of the area for a number of species, such as deer and elk. However, there are species within Lifeform 5 that do not use edges as readily as others. The species that occupy earlier structural stages would be more likely to undergo a reduction in suitable habitat than those species that use primarily the middle or later stages.

Wolverines exhibit a preference for edges between cover and forage areas similar to other species in Lifeform 5; although they den in areas similar to grizzly bears. The impact of the expected reduction in edge habitat on wolverines would be lessened to the extent that wolverines use high-elevation alpine (i.e., non-forested) habitat in the Planning Area, including open, park-like “subalpine” forests. The edge habitat and open areas would be affected less by implementation of the alternatives than would lower and mid-elevation forests. Road-management efforts to provide secure habitat for grizzly bears and gray wolves will also meet the most important limiting factors for wolverines in the Planning Area, which are remoteness and protection from human disturbance and poaching.

Lynx populations and range are associated with their most common prey, the snowshoe hare. The Planning Area is not generally considered to fall within the range of “classic lynx habitat”. Analysis of habitat conditions (edge habitat) for the snowshoe hare through the HCP period projected a decrease in suitable habitat. This decrease is a result of the growth of earlier structural stages and a decreased rate of harvest, and therefore, less creation of hare habitat on National Forest lands. Lynx may find adequate prey levels in certain portions of the Planning Area where natural or managed conditions of the landscape provide for suitable prey levels for periods of time. Lynx should continue to find adequate travel corridors along

riparian areas, hiding and denning habitat in older stands, and ample amounts of foraging habitat in younger stands (albeit, these stands may not all be immediately adjacent to distinct edges).

All alternatives are expected to provide sufficient edge for healthy elk and deer populations. In addition, it should be noted that elk and deer do have requirements for sufficient cover; there is value associated with mature forests as foraging habitat late in the growing season; there is value to maintaining security and thermal cover; and that vulnerability would be reduced as a result of road management implemented in association with Plum Creek's HCP and the ~~NWFP~~ [amended Forest Plans](#). Road densities may be of more importance where hiding cover is a limiting factor. The availability of quality forage and hiding cover contribute to the year-round distribution of deer and elk; during some times of the year, these species (elk in particular) often seek larger, more-secure, blocks of cover. These habitat attributes will likely improve under all alternatives because the majority of the lands will be managed under the HCP or ~~NWFP~~ [the amended Forest Plans](#). Elk and deer also show preferences for moist sites during portions of the year, such as spring parturition and lactation periods and later summer/fall. Many of the special habitat provisions for wetlands and forested wetlands, as well as HCP provisions to avoid road-building near meadows during the spring in the Grizzly Bear Recovery will benefit elk and deer.

Many of the innovative silvicultural applications being used by Plum Creek and those expected to be applied in association with the DNR HCP and by the Forest Service for reduction of fire risk will provide within-stand structure that will likely enhance the use of early-seral stages by deer and elk, and other wildlife in Lifeform 5. Alder, as a stand component, will be retained on the majority of lands within the Planning Area. Reduced burning of harvest units will result in less alder regeneration; but, because this will reduce the need to spray, this will ultimately result in a much healthier and abundant alder component in regenerated stands (which should yield incidental benefits of nitrogen fixation). Protection of riparian areas is also expected to provide an alder component and should maintain a source of downed logs as well to benefit some Lifeform 5 species such as ruffed grouse.

Alternative 2 (Partial HCP). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Changes are similar across all alternatives due to the landscape effects of the HCP and ~~NWFP~~ [the amended Forest Plans](#) and the variety of structural stages that many of the species in this Lifeform utilize (see No Action Alternative above). Because this alternative will not implement HCP guidelines and measures on ~~10,800~~ [10,200](#) acres Plum Creek will acquire from the Forest Service, species that might use forested cover in or adjacent to riparian areas, seeps or springs, rock and talus areas, or larger wetlands will not benefit as greatly under this alternative when compared to the Proposed Action.

Alternative 3 (Proposed Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Site-specific HCP measures implemented on the ~~10,800~~ [10,200](#) acres Plum Creek will acquire will add localized benefits to those species in this Lifeform that use forested cover in or adjacent to riparian areas, seeps or springs, rock and talus areas, or larger wetlands. Retained forested cover adjacent to these resources are more likely to be distributed across the landscape after even-aged harvesting and will benefit species such as deer, elk, lynx, wolverine, grouse, and snowshoe hares that use a variety of structural stages for foraging and protection from predators and disturbance.

4.7.4.6 LIFEFORM 6

Species in this Lifeform include some warblers and the porcupine. For purposes of analysis, primary habitat was considered to include the percentage of land in riparian and wet sites occurring in the earlier structural stages (stand initiation, shrub/sapling, and young forest), whereas secondary habitat was the percentage of those units occurring in the later structural stages (PT through OG). Impacts are likely over-estimated for all alternatives because no stochastic events were modeled. Timber harvest was the only stand-regenerating event that was modeled. Additional habitat will occur as a result of yarding corridors, fire, blowdown, insect infestations, beaver, and other natural and man-made disturbances. These events are likely to occur and would create openings conducive to species in this Lifeform.

Alternative 1 (No Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Since primary habitat decreases to 1 percent in the later periods, the Fish and Wildlife Service conducted an in-depth analysis for each of the species contained in this Lifeform prior to issuing the permit. The analysis contained within the Service's Unlisted Species Analysis (USFWS 1996) is herein incorporated by reference.

The expected decrease in primary habitat is due to the modeled reduction in timber harvest activity anticipated within RHAs across all ownership's in the Planning Area, as a result of management focused on late-successional and aquatic species, which requires retention of later structural stages of forest development. As might be expected, different species in this Lifeform may be affected differently over the HCP period. Many species will also find suitable habitat outside RHAs and therefore, the HCP analysis may have underestimated the amount of suitable habitat by only searching for the appropriate structural stages in RHAs. Additionally, species that find primary breeding habitat in early structural stages within riparian areas, may also use open forests and nonforested habitats, and therefore, may also be less affected than predicted by the models. For example, species such as the Lincoln's sparrows are typically associated more with aquatic habitats than with structural stages and thus would not be as affected. Other species, such as common nighthawk, find their primary breeding habitat in these early stages and would likely be affected to a larger degree, leading to possible reductions in local populations or changes in their local distribution. Common Porcupines occur in a wide variety of forest structural stages. The foraging strategy for common nighthawks and common poorwills does not tie them to riparian areas. Openings in the forest canopy for foraging will continue to exist above larger-width streams and rivers and nonforested wetlands, as well as talus slopes and associated open forests. Townsend's solitaire and Nashville warbler are not necessarily associated with wetlands or other aquatic habitats, and would likely continue to use early structural stages outside of the riparian areas. Wilson's warbler uses well-developed shrub layers in older structural stages and wet habitats; and the orange-crowned warbler uses a wide variety of habitats with a well-developed shrub component, and can be found in suitable upland stands.

Alternative 2 (Partial HCP). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Under this alternative, Lifeform 6 would find additional habitat on the non-HCP lands due to implementation of State Forest Practices Rules and Regulations. Resulting timber harvests along nonfish-bearing streams and in forested wetlands would benefit some of these species by providing early seral stages in and around streams and wetlands. In the absence of natural events initiating succession (e.g., wildfires, beaver foraging), these habitats may rely on timber harvest for their creation. However, with the larger blocks of habitat managed by the Forest Service, it is possible that fire-management policies conducive to initiation

of succession in riparian areas may occur to a greater extent than would have occurred in the absence of the land exchange.

Alternative 3 (Proposed Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ The decreasing trend in both suitable and primary habitat as observed in the No Action and Partial HCP Alternatives occurs under this alternative as well. This result is, as mentioned above, due to the modeled reduction in timber harvest activity anticipated within RHAs across all ownerships in the Planning Area, as a result of management focused on late-successional and aquatic species. Early successional stages will be found in proximity to RHAs and wetlands in the form of harvest units and areas altered by other forest-management activities. Openings in RHAs from natural disturbances or created by yarding corridors will provide habitat for these species. Although the analysis of the earlier structural stages within RHAs showed a decrease through time, the resultant habitat conditions within RHAs may reflect more natural conditions at the end of the HCP period.

Most Lifeform 6 species inhabiting the Planning Area historically would have evolved with the natural landscape. They are adept at pioneering new and transient habitat patches resulting from disturbances, generally having good dispersal abilities. They also tend to be able to capitalize on opportunities to reproduce when and where these habitats are available. Many such species also use the more open habitat types east of the Planning Area and are only occasional visitors within the more-densely forested landscapes.

Should any species associated with these stages appear to be affected from the cumulative effects of forest management by Plum Creek and the Forest Service, appropriate management options (e.g., controlled burns or small harvests) for these species would be evaluated. Should concern for the welfare of any of these species develop in the future, adaptive-management strategies as outlined in the HCP may be used as a tool to address the biological needs of species of concern.

4.7.4.7 LIFEFORM 7

Species in this Lifeform include sparrows, blackbirds, and thrushes. The little willow flycatcher, a Special Emphasis Species, is included in this Lifeform. For purposes of analysis, primary habitat included the analysis units in riparian and wet sites in the early to mid-stages (SI/SS, YF, PT, DF). Secondary habitat included those units in the other stages (SI/SS, MF, MOG, and OG).

Alternative 1 (No Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Primary habitat will decrease slightly. Thus, species that find primary breeding habitat in the early to middle stages grouped as primary habitat, such as the calliope hummingbird, may be adversely affected under this alternative, leading to a possible reduction in local populations or changes in local distribution. However, retention of existing deciduous components of riparian areas (which are currently limited within the Planning Area) or within partial harvest areas in the RHAs would help mitigate potential adverse effects. In addition, forest edges created through partial harvests in RHAs may provide willow flycatcher habitat as the woody cover develops, particularly if some deciduous components (e.g., vine maple, elderberry) are retained. Retention of deciduous shrubs and small trees within 200-foot or 100-foot RHAs, and RLTA along perennial streams in the Planning Area will provide appropriate habitat. Those species more-typically associated with aquatic habitats, regardless of forest structural stage, would likely be less affected, because of the protection afforded to aquatic habitats.

Alternative 2 (Partial HCP). ~~Changes in habitat during the HCP period are presented in Table 7.~~ A similar decreasing trend is observed as in the No Action Alternative. Additional harvesting adjacent to riparian areas that would occur due to implementation of State forest practices under this alternative may provide some benefits to selected species in this Lifeform by initiating forest succession. However, some benefits such as more extensive forested cover along streams for nesting green herons would be less, since no HCP RHA's or more extensive buffers on larger wetlands would be implemented under this alternative.

Alternative 3 (Proposed Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ A similar decreasing trend is observed as in the No Action and Partial HCP Alternatives. HCP measures would be implemented on the lands Plum Creek will acquire and effects to species in this Lifeform will be as described under the No Action Alternative.

4.7.4.8 LIFEFORM 8

Species in this Lifeform include some warblers and flycatchers. For purposes of analysis, primary habitat was defined as the percentage of land throughout the Planning Area occurring as SS, YF, and PT. Secondary habitat was defined as the percentage of land occurring as the later stages (DF through OG). As a group, the species in Lifeform 8 occupy a wide range of structural stages, and riparian and aquatic areas as primary habitat.

Alternative 1 (No Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Selective harvest in RHAs and occasional yarding corridors will open the tree canopy in some areas that will encourage more vigorous understory shrub growth providing foraging and nesting opportunities for species such as yellow-billed cuckoos. Additional habitat will occur as a result of fire, blowdown, insect infestations, beaver, and other natural and man-made disturbances. These events are likely to occur in the landscape and would create openings conducive to species in this Lifeform.

Availability of primary habitat for species that find primary breeding habitat mainly in the early structural stages, such as the bushtit or American goldfinch, would decrease over the HCP period. Those species that can use a wider range of structural stages as primary habitat or are more typically associated with riparian or other aquatic habitats, would not be as affected.

Alternative 2 (Partial HCP). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Under this alternative, Lifeform 8 may find additional habitat on the non-HCP lands. Timber harvests along nonfish-bearing streams and in forested wetlands would create early forest stages associated with Lifeform 8 in these special habitats. In the absence of natural events initiating succession (e.g., wildfire), these habitats may rely on timber harvest for their creation.

Alternative 3 (Proposed Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Effects are similar under this alternative as the No Action Alternative (see above). The quality of habitats expected to occur under the HCP are in excess of what would be expected without the HCP, especially for those species requiring structure (e.g., snags, down logs) in early-successional stages.

4.7.4.9 LIFEFORM 9

Species in this Lifeform include waxwings and grosbeaks. For purposes of analysis, primary habitat was defined as the percentage of lands in riparian areas and wet sites occurring as YF, PT, and DF. Secondary habitat included those units occurring as MF, MOG, and OG.

Alternative 1 (No Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Suitable habitat remains constant over the HCP period. The amount of primary habitat, analyzed as the combined total of YF, PT, and DF in riparian zones, is expected to decrease through the HCP period. The collective needs of species in this Lifeform, which nest primarily in deciduous trees, are generally accommodated in the riparian habitat areas and no adverse impacts are expected. Limited removal of trees from RHAs would retain and provide species and structural diversity. The HCP will likely retain more large deciduous trees than would have occurred without the HCP.

Alternative 2 (Partial HCP). ~~Changes in habitat during the HCP period are presented in Table 7.~~ On non-HCP lands, it is not obvious how the more aggressive riparian harvest may ultimately affect the amounts of mid-aged forest available for this Lifeform. The greater harvest expected to occur in forested wetlands would most likely result in less diverse stands on non-HCP lands. Treatment of riparian and wetland areas without the HCP would be expected to result in fewer mature deciduous trees in these areas.

Alternative 3 (Proposed Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ To the extent that deciduous trees (where present) are retained in riparian zones, the collective needs of the species in this Lifeform, which nest primarily in deciduous trees, can be accommodated in the RHAs and would benefit from applying the HCP riparian strategy to the ~~10,800~~ 10,200 acres Plum Creek will acquire.

4.7.4.10 LIFEFORM 10

Species included in this Lifeform are squirrels, tanagers, and some warblers. The olive-sided flycatcher, a Special Emphasis Species, is included in this Lifeform. For purposes of analysis, primary habitat was defined as the percentage of lands occurring in the middle to later stages (PT through OG), with secondary habitat as the percentage of units occurring as shrub/sapling and young forest stages.

Alternative 1 (No Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ The combination of middle to later structural stages considered primary habitat for species in this Lifeform is expected to increase over the course of the HCP period. Secondary habitat (shrub/sapling and young forest) is expected to decrease. Overall, the total suitable habitat for these species is expected to increase. Thus, the needs of these species, which nest primarily in coniferous trees, should be well-accommodated.

Alternative 2 (Partial HCP). ~~Changes in habitat during the HCP period are presented in Table 7.~~ On the non-HCP lands, leave trees are apt to be less robust, additional trees will not be retained when snags are lacking, and trees in riparian areas would be counted as leave trees thereby resulting in many harvest units devoid of leave trees in the uplands. Resulting stands developing from such harvest units would not contain the same structural diversity as stands developing under the Plum Creek HCP, DNR HCP, or the NWFP. Species diversity, including mature and young hardwoods, would be expected to be less on these non-HCP lands as well.

Alternative 3 (Proposed Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ The needs of most of these species, which nest primarily in coniferous trees, should be accommodated under all alternatives. Components of the HCP and NWFP will protect streamside corridors, certain spotted owl nesting locations, and forests on unstable slopes. Under this alternative and implementation of HCP measures and guidelines on the ~~40,800~~ **10,200** acres Plum Creek would acquire from the Forest Service, maintenance of streamside corridors with large trees and snags, retention of snags and “green” leave-trees in the harvest units, and measures to maintain spotted owl habitat will help provide forest-habitat elements to benefit Lifeform 10 species, such as the olive-sided flycatcher. Trees retained within the above management areas will provide perching and nesting sites, and forest edges and openings within the RHAs will result in structural variety for foraging.

4.7.4.11 LIFEFORM 11

Species in this Lifeform include vireos, some thrushes and sparrows, and some hawks (e.g., the northern goshawk, a Special Emphasis Species). For purposes of analysis, primary habitat was defined as the percentage of lands occurring as pole-timber through old-growth. Secondary habitat included the younger stages created after the first decade of the HCP period to reflect those that include some residual trees retained during harvest.

Alternative 1 (No Action). ~~Changes in habitat during the Permit period are presented in Table 7.~~ Similar to Lifeform 10, suitable habitat for species in Lifeform 11, which also nest in trees, is expected to increase over the course of the HCP period. The expected reduction in earlier structural stages may reduce at least a portion of the primary habitat (either nesting or foraging) for some species, such as the chipping sparrow or American robin, which use edges or earlier stages. The NWFP and both HCPs are expected to address the needs of Lifeform 11 through their leave tree strategies and through measures taken to address mineral springs and seeps (HCP Section 3.4.5). Species in this Lifeform, such as the band-tailed pigeon may also use forested wetlands and edges. Band-tailed pigeon use of the Planning Area is expected to be concentrated on the westside and primarily at lower elevations during the nesting season. The limited use of herbicides as indicated in Section 1.2.3 of the HCP, would serve to preserve the usefulness of early-successional habitats as forage production areas. Similar benefits are expected to occur on DNR HCP lands as well as under the NWFP. Under all alternatives, the ~~NWFP~~ [amended Forest Plans](#) will protect special sites such as mineral springs and seeps, but will not likely result in the creation of much edge habitat in the absence of stochastic events.

Alternative 2 (Partial HCP). ~~Changes in habitat during the HCP period are presented in Table 7.~~ The Partial HCP Alternative on non-HCP lands does not protect forested wetlands, which are used by a large number of species within this Lifeform and would not retain leave trees in upland areas. Springs, seeps, and perennial non-fishbearing streams may or may not be protected under State Forest Practices Rules and Regulations to benefit species in this Lifeform.

Alternative 3 (Proposed Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Effects are similar under this alternative as the No Action Alternative (see above) due to the implementation of HCP measures and guidelines to the ~~40,800~~ [10,200](#) acres of land Plum Creek would acquire as a result of the land exchange. The quality of habitats expected to occur under the HCP are in excess of what would be expected without the HCP, especially those species using wetlands, springs and seeps, riparian areas, and those benefits from retained trees in harvest units, talus buffers, and spotted owl deferrals.

4.7.4.12 LIFEFORM 12

Species in this Lifeform include herons, osprey, great horned owl, and the bald eagle (a Species of Concern). The species in Lifeform 12 use large trees, but often near water. Primary habitat for the Lifeform was considered to be the percentage of lands in riparian and wet sites occurring in the later structural stages (DF through OG), whereas secondary habitat was the percentage of those units occurring in the PT structural stage.

Alternative 1 (No Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ The total amount of primary habitat in the Planning Area that includes riparian areas is expected to increase over the

course of the HCP period. Suitable habitat (which adds only PT to that already present under primary habitat) shows a similar increasing trend. Habitat trends for Lifeform 12 reflect the protection extended to riparian areas and wetlands by the Federal RCAs- [Riparian Reserves](#), the DNR RMZs, and Plum Creek's RHAs. The riparian habitat areas would retain sufficient forest structure to serve as a source of large nest trees for species in this Lifeform. Although not counted in the Lifeform analysis, foraging habitats in the earlier structural stages (e.g., SI) for some species, such as great horned owls and red-tailed hawks, would decrease in area across the Planning Area, particularly on National Forest lands. Nevertheless, because these species forage in a variety of structural stages, as well as special habitats (such as wetlands, meadows, and talus), sufficient foraging habitat should remain in the Planning Area. Natural openings in higher elevation areas (i.e., meadows, talus slopes) and timber-harvest areas should provide foraging habitat for the great grey owl. Great grey owls may also use higher-elevation wetlands.

Alternative 2 (Partial HCP). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Special habitat areas on non-HCP lands such as high-elevation wetlands and meadows would not receive the same protections without the HCP. However, the total number of acres to be acquired in these habitat types is expected to be very low.

Alternative 3 (Proposed Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ The implementation of HCP guidelines and mitigation measures on the ~~40,800~~[10,200](#) acres Plum Creek would acquire will benefit these species in the form of larger riparian buffers to be managed toward a late successional stage, providing future nest trees and cover.

4.7.4.13 LIFEFORM 13

Species in this Lifeform include the primary cavity excavators that nest in snags and defective trees. Woodpeckers are the major group of species included in this Lifeform. Because of differing needs among the species for snags of suitable size, this Lifeform was partitioned into two subgroups, "13," and "13a." The primary habitats for both subgroups 13 and 13a were thought to be those structural stages most conducive to providing snags and defective trees of suitable size. Lundquist and Hicks (1995) stated that the number and distribution of suitable snags and downed logs in the forested stands throughout the Planning Area is generally a more-important predictor of woodpecker habitat than is the amount and distribution of particular structural stages. Nevertheless, the primary habitats were thought to be those structural stages most-conducive to providing snags of suitable size.

4.7.4.13.1 *Lifeform 13a*

Several species, including the pileated, white-headed, and Lewis' woodpeckers (which are each Species of Concern), were included in subgroup "13a." For purposes of evaluating habitat conditions through the 50-year HCP period, Lifeform 13a was considered to have primary habitat affinity for forests from mature through old-growth structural stages, with secondary habitat occurring as the younger structural stages. Secondary habitat included young forests but only after a delay of 10 to 20 years for 13a.

4.7.4.13.2 *Lifeform 13*

Primary habitat for the majority of the species in Lifeform 13 was considered to be structural stages from dispersal forest through old-growth. Secondary habitat included young forest and pole timber. Under all alternatives, the majority of the Planning Area will be managed with attention to providing for the needs of

cavity-excavators. The Plum Creek HCP and DNR HCP both provide for high-quality snags and leave trees within the harvest units. Forest Service management is expected to focus on thinnings from below in both LSRs and in AMAs which should improve habitat conditions for these species.

Alternative 1 (No Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Suitable habitat would increase for Lifeform 13 and Lifeform 13a in the Planning Area over the HCP period. The increase in suitable habitat reflects the general aging of forests in the Planning Area and the elimination of the even-age harvest on Federal lands. RHAs, deferred owl cores and dispersal corridors, and retention of larger trees in areas of only partial harvest will improve habitat conditions for these species. HCP provisions and Environmental Principles employed by Plum Creek normally require the retention of larger trees and snags in harvest units. The trees and snags retained will contribute to the structural diversity of the forests and this structural diversity would be maintained throughout the HCP period.

Species in this Lifeform rely on concentrations of snags and coarse woody debris that are usually not found within a managed forest. Plum Creek's commitment to experiment with new forestry techniques that retain high percentages of existing trees with very high retention of snags and defect may provide key habitat for these species. This is also true of stands that develop after shelterwood harvest where Plum Creek retained the shelterwood trees throughout the rotation. Retention of stands following fire or insect infestations would be consistent with the goals of the late-successional reserves or adaptive-management areas under the NWFP but would be unlikely to occur under the Plum Creek HCP. Therefore, significant amounts of such timber is most likely to occur on Federal lands, but salvage logging may have significant impacts upon these species and their habitats if it were to occur on those lands.

Recent analysis of snag levels on nonfederal forested lands in Washington and Oregon (Ohmann et al. 1994) suggests that the required number of suitable snags for several species are not being met in all structural stages at or near maximum population levels under current and past Forest Practices Rules and Regulations. Moreover, this varies by forest type. For example, stands in the early structural stages (e.g., SI/SS and YF) tend to provide relatively fewer snags for some woodpecker species than later stages, and ponderosa pine was the least capable of providing required snag densities among the types analyzed (Ohmann et al. 1994). This largely reflected the relative lack of snag and live tree retention using traditional silvicultural practices. Differences in the use of structural stages and requirements for specific habitat elements, underscores the importance of retaining large snags and live trees during harvesting operations, as provided for in the HCP, which exceeds those required under State Forest Practices Rules and Regulations, to provide current nesting habitat in early structural stages and to provide a source of future nesting habitat.

Black-backed woodpecker and three-toed woodpeckers will benefit from actions such as snag and green tree retention of larger diameter trees in harvest units, selective harvest of ponderosa pine stands east of the Cascades, and maintenance of RHAs. Older structural stages will exist in all forest classes throughout the HCP Planning Area during the Permit period (See HCP Table 306). Black-backed woodpeckers may utilize the lower-elevation forest classes to a somewhat greater extent than three-toed woodpeckers; however, both of these species key in on unusual concentrations of standing dead and dying timber.

Other species, such as the pygmy nuthatch, rely on the ponderosa pine forest type. Older structural stages in the ponderosa pine/Lodgepole pine forest class will increase during the HCP period, on both Plum Creek lands and the entire Planning Area as a whole (see HCP Table 30b). The use of selective harvesting by

Plum Creek in ponderosa pine stands will result in multi-aged stands over the HCP period, providing a diverse structure to meet the foraging and nesting needs of these species. Additional habitat will be provided in RHAs through the retention of large diameter trees and maintenance of spotted owl habitat, wetland buffers and retention of forested wetlands, and snag and green tree retention in harvest units.

Lewis' woodpeckers are likely to occur in limited locations, such as riparian areas with shrub understories where Lewis' woodpeckers engage in "hawking" behavior in search of flying insects. Recently harvested or burned coniferous forest is an important part of the Lewis' woodpecker habitat, but only during the shrub stage. White-headed woodpeckers rely on maintenance of older, more-complex structural stages and retention of broken-topped snags, leaning logs, and high-cut stumps in harvest units and riparian areas. These efforts would be particularly effective in open areas dominated by ponderosa pine, where partial- or selective-harvesting techniques retained tall (e.g., up to eight feet) and large (e.g., over 20 inches DBH) ponderosa pine and Douglas-fir stumps. The Planning Area does not include large acreages of the ponderosa pine timber type (5,020 acres within current Plum Creek HCP ownership, and 18,075 acres within the Planning Area). In addition, the HCP contains specific provisions for maintenance of large snags and uneven-aged management in ponderosa pine stands.

Alternative 2 (Partial HCP). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Only 65 acres of ponderosa pine habitat would be acquired under the action alternatives. Application of State Forest Practices Rules and Regulations to newly acquired lands under the Partial-HCP Alternative would provide fewer benefits to these species, but the amount of acreage of non-HCP lands would be small in comparison to the entire Planning Area.

Alternative 3 (Proposed Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ The implementation of HCP guidelines and mitigation measures on the ~~10,800~~ **10,200** acres Plum Creek would acquire will benefit these species in the form of larger riparian and wetland buffers to be managed toward a late successional stage, protecting additional snags and future snags sources. Additional foraging areas would occur in special habitat buffers (e.g., talus slopes, spotted owl deferrals) and in greater numbers of retained trees in harvest units.

4.7.4.14 LIFEFORM 14

Species in this Lifeform include bats and other secondary cavity nesters. Because of slightly differing habitat requirements between species in this group, species were subdivided into two subgroups based on structural stages. The primary habitats of both Lifeforms are those structural stages most conducive to providing cavities and hollow trees of suitable size.

4.7.4.14.1 *Lifeform 14a.*

The Pacific fisher (Special Emphasis Species), flammulated owl (Species of Concern), and Vaux's swift (Species of Concern), which are discussed in further detail in Lundquist and Hicks (1995), were included in Lifeform 14a. For purposes of evaluating habitat conditions through the HCP period, Lifeform 14a was considered to have primary habitat affinity among the later structural stages (MF through OG), with secondary habitat occurring as DF.

4.7.4.14.2 Lifeform 14.

The western bluebird (Species of Concern) and 5 myotis species (Special Emphasis Species) are included in Lifeform 14. Primary habitat included the later structural stages, from DF through OG, and secondary habitat included the younger stages.

Alternative 1 (No Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Suitable habitat would increase for Lifeform 14 and Lifeform 14a in the Planning Area over the HCP period. RHAs, NRF, and FD habitats each contribute areas where old trees are retained. Environmental forestry retains larger trees and snags in harvest areas. These measures combine with measures on National Forest land managing for late-successional forest characteristics to result in the increase in habitats for these Lifeforms. Although not contained in the modeling, the presence of NRF-management areas and Dispersal-management areas within the DNR's HCP in the Planning Area will also contribute to the retention of suitable habitat for this Lifeform.

Secondary cavity-nesters such as western bluebirds use cavities created by other birds (e.g., Lifeform 13), especially in snags located next to openings. Maintenance of riparian corridors with large trees and snags, and the retention of snags and "green" leave trees in harvest units and younger stands will maintain a supply of suitably sized trees for potential nesting cavities. Continued timber harvesting across the Planning Area would provide some forest openings, which, together with other structural stages, would result in a mixture of stands in various stages of regeneration.

In order to meet the needs of species that require large natural cavities such as Lifeform 14a, appropriate snags and defective live trees with natural cavities can be targeted in identifying trees to retain in each harvest unit. As mentioned previously, RHAs and set-asides for spotted owls on Plum Creek's lands, and RCAs [Riparian Reserves](#) retained on National Forest lands, should enhance the capability of the Planning Area to provide nesting and foraging habitat for cavity-dwelling species, including secondary cavity-nesters.

For instance, the primary limiting factor for Pacific fisher appears to be availability of denning sites in older, more-complex, forest-structural types. Den sites consist of "hollows" in live trees, snags, and logs. Habitat measures taken in the HCP to increase or maintain more-advanced, forest-structural classes (e.g., DF, MF, MOG, OG) for spotted owls will benefit the fisher. Management practices proposed in the HCP to retain representative green trees, snags, and downed logs in harvest units and to retain similar structural components in RHAs and wetlands will reduce impacts and adequately address the biological needs of this species by providing travel corridors, denning sites, canopy cover, and a prey base. Riparian corridors along nonfish-bearing streams are expected to be more robust on the Eastside Cascades and at lower elevations on the Westside, which should incidentally correspond with areas of lower snow depth used by fishers. National Forest RCAs [Riparian Reserves](#) are expected to be robust in all areas and harvest operations, scheduled to occur on National Forest lands, are expected to be beneficial or have little effect on this and other Lifeform 14 species.

Myotis bats are considered to have primary habitat affinity among the later structural stages (i.e., MF through OG), similar to Vaux's swift. Primary habitats are the stages thought to be most conducive to providing cavities and hollow trees suitable as roosting areas.

Under the HCP, 100-foot buffers would be provided at cave entrances, and additional actions will be evaluated on a case-by-case basis to protect the integrity of cave passages. An emphasis will be placed on retaining large, hollow snags. OG will be retained at approximately current levels on Plum Creek lands.

Management options, which will maintain older forests, retain structural elements (e.g., large snags and large green trees) throughout the various successional stages, and maintenance of riparian corridors will provide suitable roosting and foraging habitat for bats. Avoiding activities near talus slopes and developing buffers around caves and abandoned mines, and restricting human access to cave and mine entrances would ~~minimize~~ **reduce** human impacts, and also help preserve existing bat habitats. Bat species in the Planning Area would also benefit from management of Federal lands for the northern spotted owl, including retention of late-successional forests, riparian corridors, and buffering of caves and mines used by bats.

However, flammulated owls occur in timber stands dominated by ponderosa pine within the Planning Area. The Planning Area does not include large acreages of the ponderosa pine timber type (5,020 acres within Plum Creek's current HCP ownership, and 18,075 acres within the Planning Area) and it is only located east of the Cascade crest. Flammulated owls nest in large pines in mid- to late-seral stages. Primary habitats for the species will increase from about 39 percent to ~~42~~**44** percent. MOG increases from ~~8~~**13** percent to ~~27~~**36** percent, and OG increases from ~~less than 14~~ percent to ~~2~~**9** percent. In addition, the HCP contains specific provisions for maintenance of large snags and uneven-aged management in ponderosa pine stands.

Alternative 2 (Partial HCP). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Application of State Forest Practices Rules and Regulations to newly acquired lands under this alternative would provide fewer benefits to these species, but the amount of acreage of non-HCP lands would be small in comparison to the entire Planning Area. Only 65 acres of ponderosa pine habitat would be acquired by the Forest Service under the action alternatives.

Alternative 3 (Proposed Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ All the benefits associated with the retention of habitat structures important for this Lifeform will be realized on the lands Plum Creek will acquire through implementation of HCP guidelines and mitigation measures on these ~~10,800~~**10,200** acres. These benefits are described more fully under the No Action Alternative above for Lifeform 14.

4.7.4.15 LIFEFORM 15

Species in this Lifeform include shrews, bears, and voles. Species in this Lifeform may use a variety of structural stages and special habitats or elements as primary breeding habitat and as foraging habitat. The habitat analysis for Lifeform 15 displays the relative amounts of young-, middle-, and late-structural stages, as defined in Section 3.7.5.

Alternative 1 (No Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ With implementation of the HCP, early-aged habitat for Lifeform 15 would decrease, while middle- and late-aged habitat would increase. Although early-successional habitat would decrease, many species in the category would also use wetlands, meadows, rock slopes, and other non-forested habitats, which account for, about another ~~42~~**13** percent of the Planning Area.

Given the diversity of wildlife species in this Lifeform, it is reasonable to expect widely different responses among the species to changes in structural stages throughout the HCP period. For example, for species that find primary habitat in the early structural stages, such as the broad-footed and least moles, vagrant shrew, creeping and Townsend's vole, and the northern pocket gopher; primary habitat will become less prevalent as a result of current stands in early stages developing into canopied stands, as well as the relatively low level of harvest assumed on National Forest lands. These actions would make the Planning Area generally less suitable for populations of these species under all alternatives. Species dependent on early successional habitats in this landscape generally fall into two categories: those that have developed mechanisms to pioneer and disperse in a manner consistent with these ephemeral stages, or those that are at the fringe of their range and utilize adjacent ecotypes to a greater extent. The Services believe that abundant opportunities will exist to create early successional habitat if necessary and believe that these species have mechanisms to compensate for the apparent decline. More importantly, the Services note that there will be a greater abundance of these habitat types on the landscape than would occur in the absence of timber harvest. Lastly, the Services note that 12.13 percent of the Planning Area is in a nonforested condition such as meadows, shrub fields, and alpine tundra. Much of this habitat is also used by species in Lifeform 15 (early), but was not included in the models.

The acreage of the late stages is expected to remain relatively stable during the first 20 years, then gradually rise during the remainder of the HCP period, for a slight net increase by the end of the HCP period. For species finding primary habitat mainly in the later structural stages (MF through OG), such as the shrew-mole, there is little impact to these species based upon landscape-level amounts of structural stages under these alternatives.

Species adapted to a wider range of structural stages, or whose primary habitat includes the middle stages (PT and DF), such as the masked and Trowbridge's shrews, ermine, and Townsend's chipmunk, would likewise be relatively unaffected (or perhaps, benefit) under the HCP, in terms of the available structural stages, under any of the alternatives.

Alternative 2 (Partial HCP). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Additional harvesting near riparian areas and special habitats such as talus slopes and springs as a result of implementing State Forest Practices Rules and Regulations on non-HCP lands may benefit some species in this Lifeform at site-specific areas, but may impact others negatively. However, since the non-HCP lands are a small proportion of the Planning Area, the landscape level scale used in this analysis masks localized effects.

Alternative 3 (Proposed Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Effects are expected to be similar for this alternative as the No Action Alternative for Lifeform 15 and are described more fully above.

4.7.4.16 LIFEFORM 16

Species in this Lifeform include kingfisher, water shrews, river otter, beaver, and muskrat and are all associated with aquatic habitats. Primary habitat was considered to be the percentage of lands in riparian and wetland sites occurring in the later structural stages (DF through OG), whereas secondary habitat was the percentage of those units occurring in the earlier structural stages. These species would be associated mainly with the aquatic habitats for breeding, rather than specific forest structural stages. For instance,

beavers use a variety of forest structural stages that are adjacent to riparian areas and are more dependent on the type of water course, amount of flow, topography, and soil conditions that are conducive to creating open water bodies and deciduous vegetation for foraging. Nevertheless, maintenance of the later structural stages adjacent to the aquatic habitats would help maintain optimum conditions.

Alternative 1 (No Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ With implementation of the HCP, habitat conditions for Lifeform 16 will improve as forest structural classes along streams and wetlands advance to more-complex conditions. The increase/improvement in habitat for these species is primarily due to the planned reduction in harvest activities near streams and wetlands on both Plum Creek and National Forest lands during the HCP period. Similar results are expected to occur on lands managed under the DNR HCP. Road BMPs, in conjunction with the protection and buffering of riparian and other aquatic habitats should provide for the needs of species in Lifeform 16 in the Planning Area.

Alternative 2 (Partial HCP). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Localized impacts to species in Lifeform 16 may result in the Partial HCP Alternative due to site-specific measures near aquatic habitats not being implemented on ~~10,800~~ 10,200 acres Plum Creek would acquire. These riparian and wetland areas would be instead treated according to State Forest Practices Rules and Regulations and benefits to these species may or may not occur.

Alternative 3 (Proposed Action). ~~Changes in habitat during the HCP period are presented in Table 7.~~ Plum Creek's RHAs and Forest Service RCAs Riparian Reserves would be applied to each new land base affording species in this Lifeform greater protection than the Partial HCP Alternative.

4.7.5 CONCLUSION

Suitable habitat amounts for the various Lifeforms were based upon the eight stand structure stages. Examining the amount of change in these stand structural stages provides direct insight into the small changes observed for each of the Lifeforms. When using a "search area" that includes the entire Planning Area, there are no ~~the only~~ differences greater than 2 percent between the No Action Alternative and the action alternatives. ~~was a 4 percent decrease at year 2045 for YF (5 percent vs. 9 percent for the No Action Alternative) and a 3 percent increase at year 2045 for MF (24 percent Vs 21 percent for the No Action Alternative).~~ When using a "search area" of RHAs and RCAs Riparian Reserves, the only difference was a ~~6 percent increase at year 2045 for DF (15 percent Vs. 9 percent for the No Action Alternative)~~

The special habitats (caves, cliffs, talus, springs, seeps, wetlands, forested wetlands, and lakes and ponds) have also been addressed in the HCP. For instance, forested wetlands, which would be otherwise unprotected, will retain forest cover as a result of the HCP. These special habitats are particularly important for many species. As an example, western bluebirds use open habitats but require cavities in snags or other structures for nesting. Each of these special habitats will be better protected under the HCP than under current State Forest Practice Rules and Regulations, but the differences at a landscape level are generally small due to the relatively small amount of acreage acquired by Plum Creek in comparison to the size of the Planning Area as a whole.

National Parks and Wilderness areas adjacent to the Planning Area provide suitable habitat for some species. The checkerboard ownership pattern provides an interspersed pattern of Federal lands with opportunities

for patch sizes as large as 640 acres. However, perhaps the largest differences between all the alternatives is the spatial relationship of forest types. Barriers to spotted owl movement and distribution has been cited as a major impediment to recovery (Lujan et al. 1992) and providing unimpeded movement for spotted owls is a major objective of the Snoqualmie Pass Adaptive Management Area. SPAMA cited the need for land exchange in order to create and manage larger blocks of contiguous old forest habitat, which would benefit certain species. Under the No Action Alternative, such National Forest lands, generally comprised of 640 or fewer acres would seldom be solely older forest. This would limit the size of old forest stands. The HCP would ensure that the amount of forest that is either in the DF Stage or older would increase over the HCP period. The amounts of Dispersal and older forest, in conjunction with the amounts of uneven-aged management, are expected to increase the effective sizes of patches of MF. Interior forest conditions should result in many stands further than 100-300 feet from younger stands. Plum Creek's average management unit size under the HCP would be about 40-50 acres. Voluntary actions described in the HCP, as well as the logistics involved with roading and access, are intended to increase the proximity of recent harvest units within the constraints of State "green-up" regulations, which should result in larger patch sizes overall during the course of the HCP. Larger patch sizes should contribute to better connectivity, especially in conjunction with the RHAs and landscape levels of dispersal forest. Specific Foraging/Dispersal corridors established for owls should also aid in connectivity. The checkerboard landscape contributes to the ability of habitats to provide connectivity.

Under the action alternatives, the potential for much larger blocks of old forest habitat exists, especially over time. The Forest Service is acquiring lands that will result in almost complete ownership of all but the southern portion of the Grizzly Bear Recovery Zone within the Planning Area (I-90 Lakes Area), and significant blocks of ownership elsewhere. The amount of National Forest lands increase especially in the high and mid-elevation areas on the eastside of the Cascade crest. Ownership patterns generally become more contiguous, but due to the small amount of land acquired by Plum Creek within the Planning Area, no particularly sizable portion of the landscape becomes exclusively industrial forestry lands.

Excessive road densities may limit use of areas by wildlife. Road densities and densities of open roads were already addressed in the HCP with special regard to grizzlies and wolves. The action alternatives now provide an opportunity for the Forest Service to further reduce road densities in areas of contiguous National Forest lands that are no longer being managed primarily for timber production. Many of the otherwise needed access roads across existing Federal ownership would no longer be needed. On the other hand, some of the newly acquired Plum Creek lands would require road construction to become fully accessible from the ground and therefore easily manageable.

4.8 FISH AND FISH HABITAT

4.8.1 ALTERNATIVE 1 (NO ACTION)

Habitat conditions and life-history requirements for both resident and anadromous fish in the Planning Area would be maintained or improved under all alternatives. Under the No Action Alternative, Plum Creek and the Forest Service would utilize similar but different strategies for managing riparian areas and protecting fish and fish habitat on lands in the Planning Area. Plum Creek would manage riparian areas and protect fish and fish habitat in accordance with its Riparian Management Strategy (Section 2.3.3; DEIS 1996), riparian habitat and fish habitat on National Forest Service lands would be managed under the NWFP and

its ACS. The riparian protection and fish and fish habitat strategies used by Plum Creek and the Forest Service have many elements in common. For example, they both use stream classification, regulatory BMPs, and riparian management areas to classify and protect stream beneficial uses such as fish-bearing streams, domestic water supplies, and nonfish-bearing perennial and seasonal streams. They differ mainly in riparian width and activities allowed in these zones.

The primary objectives of Plum Creek's strategy are to provide watershed and water quality protection, and to implement specific prescriptions to minimize impacts to resident and anadromous fish resources in the streams within the Planning Area. Under Plum Creek's Riparian Management Strategy, the Company would implement interim and minimum guidelines to protect riparian areas along fish-bearing and most large nonfish-bearing streams. These guidelines would also be provided to eastside sensitive, perennial, nonfish-bearing streams, west side perennial nonfish-bearing streams, and seasonal streams. Measures that would be implemented to protect fish habitat include the creation of RHAs of up to 200 feet on each side of fish-bearing streams, 100 foot RHAs on some nonfish-bearing streams interspersed within or adjacent to in federally designated LSRs, and 25 RLTA's along nonfish-bearing streams that contribute significant quantities of water to downstream fish-bearing streams. Prescriptions developed through watershed analysis would be also used to address potential impacts of forest management on small, nonfish-bearing streams. Both small and large nonfish-bearing streams are important sources of water, nutrients, wood, and other vegetative materials for downstream reaches that support fish and other aquatic organisms.

Both RHAs and RLTA's would maintain vegetation adjacent to streams. This riparian vegetation would provide shading to maintain cool water temperatures, forest floor debris to filter sediment, thereby decreasing the likelihood of sediment delivery to streams, and large and small woody debris to improve instream fish habitat. The growth of forest stands and active management to accelerate vegetative growth in RHAs, especially in riparian areas that were harvested or otherwise disturbed in the past, would improve fish habitat conditions in the Planning Area.

Potential surface erosion from management activities near nonfish-bearing streams would be addressed under the No Action Alternative. Riparian buffers would be placed along all streams that may be prone to landslides and debris flows. Specific prescriptions, such as requiring suspension of logs at stream crossings, minimizing the amount of area disturbed, and minimizing delivery of sediment from roads would be implemented. Watershed analysis would consider shade and large woody debris requirements for small, nonfish-bearing streams in the Planning Area.

The ACS provisions required for National Forest System lands in the Planning Area would provide the microclimate and shading necessary to maintain cool water temperatures by maintaining wide stream buffers. These wide buffers would also ensure the availability of LWD for recruitment to fish- and nonfish-bearing streams and minimize reduce delivery of sediment to stream channels. The wide buffers provided by Plum Creek's Riparian Management Strategy would also provide adequate shading for fish-bearing streams and buffering for unstable slopes. Plum Creek's would also implement prescriptions resulting from watershed analysis, thereby ensuring adequate LWD supplies from riparian corridors and minimizing sediment delivery to stream channels. As a result of measures being implemented on National Forest System lands as part of the ACS, and measures being implemented on private lands as part of Plum Creek's HCP, water quality, quantity, and fish habitat should improve throughout the Planning Area and cumulative effects should be minimal.

4.8.2 ALTERNATIVE 2 (PARTIAL HCP)

Plum Creek would continue to implement its Riparian Management Strategy on all lands managed by the HCP. However, riparian areas and fish-bearing streams on new lands acquired from the Forest Service would not be managed following the Riparian Management Strategy, but instead, would be managed following State Forest Practices Rules and Regulations. Thus, fish-bearing streams flowing through the lands acquired by Plum Creek would receive neither the same level of protection that would have been provided by the ACS nor would they receive the protection provided under Plum Creek's Riparian Management Strategy. The overall level of protection that would be provided in riparian areas and along fish-bearing streams would depend upon habitat needs and regulatory restrictions required to protect the spotted owl. Also, under Alternative 2, a larger portion of the Planning Area would be managed under the NWFP than under the No Action Alternative. Thus, more stream miles would be managed under the provision of the ACS. Overall, Alternative 2 would have a slightly greater potential to affect fish and fish habitat because of the reduction in protection of streams on lands acquired by Plum Creek, and adherence to State Forest Practices Rules and Regulations and BMPs for timber harvesting and road construction on these lands in the Planning Area.

4.8.3 ALTERNATIVE 3 (PROPOSED ACTION)

Habitat conditions and life-history requirements for both resident and anadromous fish in the Planning Area would be maintained or improved under the Proposed Action Alternative. The Proposed Action Alternative is similar to the No Action Alternative in regard to riparian protection for fish and fish habitat. Under the Proposed Action Alternative, Plum Creek and the Forest Service would utilize similar but different strategies for managing riparian areas and protecting fish and fish habitat on lands in the Planning Area. Plum Creek would manage riparian areas and protect fish and fish habitat in accordance with its Riparian Management Strategy (Section 2.3.3; DEIS 1996). Riparian habitat and fish habitat on National Forest Service lands would be managed under the NWFP and its Aquatic Conservation Strategy.

4.9 ECONOMIC AND SOCIAL ENVIRONMENT

4.9.1 ALTERNATIVE 1 (NO ACTION)

Harvesting activities allowed under the No Action Alternative would result in additional employment and income for communities affected by Plum Creek's timber operations. The timber volume allowed under the No Action Alternative would also benefit Plum Creek's export yard, and mills that depend on Plum Creek's logs as a source of supply to produce timber and wood products. ~~The timber produced on Plum Creek's lands would help offset the reductions in timber derived from Federal lands.~~

In addition to creating additional employment opportunities, Plum Creek's timber management activities would generate a significant amount of tax revenues for the State, and King and Kittitas Counties. The largest source of tax revenue would be from the timber excise tax.

4.9.2 ALTERNATIVE 2 (PARTIAL HCP) AND ALTERNATIVE 3 (PROPOSED ACTION)

Under Alternative 2 and the Proposed Action Alternative, there would be a reduction in Plum Creek's ownership in the Planning Area and a subsequent decrease in total harvestable lands. Total timber volumes produced from the Planning Area would continue to benefit Plum Creek's export yard, and mills that depend on Plum Creek's logs as a source of supply to produce timber and wood products. ~~However, the expected reductions in timber volume produced on Plum Creek's lands would help offset the expected reductions in timber volume planned for Federal lands.~~

Under both alternatives, fewer employment opportunities would be created and Plum Creek's timber-management activities would generate a slight increase in tax revenues in King County, but a substantial decrease in tax revenues in Kittitas County. Plum Creek's land ownership in King County would increase from 51,300 to approximately ~~54,000~~**52,100** acres, whereas, in Kittitas County, the Company's land ownership would decrease from 118,600 acres to approximately ~~73,400~~**79,000** acres. Employment opportunities and tax revenues in Kittitas County would depend largely upon the amount of Plum Creek's land base that would be precluded from harvesting operations because of habitat and other restrictions required to protect the spotted owl.

4.10 CULTURAL RESOURCES

(This section replaces the applicable section in the DSEIS in its entirety and the redline/strikeout format is not used.)

4.10.1 POTENTIAL EFFECTS OF FORESTRY MANAGEMENT

Archaeology

Any ground-disturbing activity has the potential to affect archaeological resources. Therefore, forest-management activities having the most effect include road construction and, to a lesser degree, timber harvest. Effects to archaeological resources range from disturbance, destruction, or loss of part or all of the resource. The greater the number of known or potential cultural sites or use areas that fall within areas that may be affected by forest management, the greater is the risk of adversely impacting archaeological resources.

Activities associated with timber sales may have potential effects upon archaeological resources that may result in a loss of information and cultural heritage. These include the following: (1) Potential rearrangement and destruction of archaeological remains from heavy equipment in logging; (2) Potential erosion/deposition from haul roads and skid trails leading to the rearrangement and destruction of archaeological sites through freeze-thaw and water-flow processes; (3) Potential rearrangement or destruction of archaeological remains through the construction and use of roads and landings; (4) Potential obscurement of ancient trails; and (5) Potential damage or destruction of ancient homesites and campsites.

It is possible that some archaeological resource sites may be inadvertently or unavoidably disturbed or destroyed by forest-management activities. This can be especially true for road construction activities and subsurface sites that cannot be located through surface surveys.

Historical Properties

Effects from forest management to historic properties may include the inadvertent destruction of recorded historic properties from logging operations, road construction, and other activities. The greater the number of historic properties that fall within areas that may be affected by forest management, the greater is the risk of adversely impacting historic properties.

Activities associated with timber sales have potential effects upon historic properties that may result in a loss of information and cultural heritage. These include the following: (1) Potential rearrangement and destruction of historic properties from heavy equipment used in logging; (2) Potential erosion/deposition from haul roads and skid trails leading to the rearrangement and destruction of historic properties through freeze-thaw and water-flow processes; (3) Potential rearrangement or destruction of historic properties through the construction and use of roads and landings; and (4) Potential obscurement of historic trails.

Traditional Places

Effects from forest management may include loss of seclusion from road construction, or loss of access from road obliteration or closure. Forest-management activities also affect traditional places by altering their character and appearance. Timber harvest typically either removes the majority of over-story trees thus re-initializing secondary succession, or removes only select trees accelerating succession and differentiation within the stand. Both of these activities can affect the values of traditional places. Traditional places can be affected by the influences of forest management on the fish, wildlife, plants, and water quality; but also by the introduction of visible signs of human presence. Timber-harvesting practices can, in some cases, drastically affect the "natural appearance" of the forest. Substantiality altered canopies, disturbed soils, displaced wildlife, and the impact of roads and skid trails upon the forest's scenic character can be caused by timber-harvesting activities.

Vegetation-management activities, particularly timber harvest, can affect scenery. Visual quality can be lowered by the presence of slash debris and openings created by timber harvesting. Burning of harvest units would also affect the visual quality for a short time. These adverse effects would eventually be reduced by regrowth of the vegetation and decomposition of slash. Other impacts on the natural appearance of the landscape would include roads that would be apparent despite efforts to carefully blend them with the landscape. Additional impacts of harvest activities include increases or decreases in structure and diversity of the vegetation. With timber harvest, the greater the amount of removal, the greater the visual contrast created by timber harvest. Roads, necessary to accommodate forest-management activities, are visible on the landscape. Roads and associated gravel borrow sources create horizontal form, line, and color contrast on the landscape by redistributing dirt and gravel permanently from its natural setting. Generally, as miles of road increase, the visual change to the landscape becomes more severe.

Cultural Resources

Activities associated with forest management can have potential effects upon cultural resources such as: (1) Potential damage or obliteration, particularly in the case of foods and medicines, from tree falling, skidding, and heavy equipment; (2) Potential erosion from haul roads or skid trails which affect water quality, fisheries, and openings containing foods and medicines; (3) Potential damage or obliteration of cultural resources through the construction and use of roads and landings; and (4) damage, destruction, or

alteration of ancient and contemporary use areas. Potential adverse effects would vary directly with the acres of land impacted by harvest units and miles of road constructed. Huckleberry fields/meadows important to the Muckleshoot Indian Tribe have contracted in response to conifer encroachment and fire-suppression. Old forest, which is also important, has become less prevalent as a result of timber harvest and a large basin-wide fire approximately 80 years ago. Forest-fringe ("tupusnukit") areas are special to the Yakama people. They have long recognized this environmental transition zone differs from the interior forest and that it contains an extremely wide array of resources. This zone is also impacted by both harvest and fire suppression.

4.10.2 EXISTING CONSERVATION MEASURES IN THE PLANNING AREA

Consequences to cultural resources are less likely to be severe under both the Northwest Forest Plan and the HCP, than under general State Forest Practices regulations. The Northwest Forest Plan will provide a mix of stand conditions with large trees, and, over time, an increased proportion of climax species and much older forest. Minimal landscape changes from timber-harvest activities or road building would occur under the Northwest Forest Plan. However, there would also be a more-visible incidence of insect and disease problems over time unless these conditions are addressed by re-introducing a fire regime, conducting risk-reduction silvicultural treatments, or both. Under the Northwest Forest Plan, cultural resources will be considered in decisions regarding land management and a host of Federal laws and policies will protect those resources. Whenever any management activity on National Forest System lands is proposed in the vicinity of a cultural or religious site, the Forest Service consults with potentially affected Tribes.

State regulations require the appropriate handling of culturally significant sites on private lands, and access to religious sites on private land may be closed to public entry (WAC 222-16-050, 222-20-100, and 222-20-120). The HCP is expected to not only comply with State regulations, but to also provide additional ancillary protection for cultural resources. With the HCP, harvest units are generally small, an average of 42 acres. Uneven-aged management forms the majority of harvests east of the Cascade Crest and about a third of the harvests west of the Crest. In general, the HCP will help maintain a natural appearance in the forest with large-diameter trees, small harvest openings, and stands with diversity in species, size class, and structure. As mentioned, east of the crest, uneven-aged management has become the dominant silvicultural treatment. All species, age classes, and sizes would be well-represented. However, seral species would dominate all size classes. Riparian and special habitat buffers are also utilized as habitat protection. Together, these HCP measures will result in a diversity of conditions on the landscape, and will protect resources associated with these special habitats. Current road maintenance, repair, improvement, and closure is accomplished according to the HCP conservation measures.

The HCP forest-management practices reflect a concern for maintaining productivity of all resources. Practices that would be detrimental to plant growth -- those resulting in soil compaction, erosion, or loss of nutrients -- will generally be avoided or minimized. This should minimize the degradation of habitats associated with food and medicinal plants. As long as timber harvests occur within the forest fringe, such places will be impacted to some degree; but, Ponderosa pine management will help restore natural vegetative conditions in these forest-fringe areas. Under the HCP there will be longer periods between scheduled harvests, generally with relatively light harvests and silvicultural prescriptions. New roads will be located away from meadows, serpentine soils, and other special habitats whenever possible. Additional

mitigation measures for meadows and special habitats included in the HCP conservation measures, are expected to benefit cultural resources and help maintain integrity of these places.

4.10.3 COMPARISON OF ALTERNATIVES

Cultural resources in the HCP Planning Area would receive special measures under all alternatives, regardless of land ownership. In addition to the numerous Federal laws protecting historic properties (including traditional cultural properties), State Forest Practices Rules and Regulations prohibit private landowners from knowingly damaging prehistoric archaeological resources or sites and specifically protect “still unrecognized” resources as well as NHPA-eligible and listed properties. State Forest Practices Rules and Regulations also direct the DNR to notify Tribes of applications involving heritage resources, including “traditional, religious, ceremonial, and social uses and activities” identified by the Tribe. All landowners are required to meet with affected Tribes with the objective of agreeing on a plan for protecting the heritage resource or value. The DNR may condition the application in accordance with the heritage resource protection plan (WAC 222-20-110). Therefore, heritage resources that are discovered on Plum Creek’s lands in the Planning Area and that would be directly or indirectly affected by the proposed land exchange would receive protections afforded by State laws.

Under the existing HCP, the Services are authorizing the incidental take of listed species and not the underlying activities. The authorization of incidental take under the modified HCP is also not authorization for land-use practices. The underlying actions of forest management and road construction require State and local permits that are outside the scope of the proposed action and are required actions regardless of whether the proposed HCP modification or any of the alternatives occur. The proposed HCP modification and alternatives also are not authorization for an exchange of Federal and private lands. The proposed land exchange is a Federal action which may have potential effects upon cultural resources, and the Forest Service will take account of its potential effects on historic properties eligible for or listed on the National Register of Historic Places. The impacts of the land exchange upon cultural resources of interest to the Tribes and others is also addressed in the DEIS and FEIS for the land exchange, which are incorporated herein by reference.

The indirect impacts of the proposed action (modifying the HCP) could include impacts to some cultural resources. For that reason, this document considers whether potential impacts to cultural resources would occur as a result of the proposed action. The proposed action is to discontinue take authorization on lands being donated or exchanged to the Forest Service and to extend take authorization to the lands acquired by Plum Creek within the Planning Area. As this action is not directly related to the land exchange or ongoing forest management, the majority of impacts are indirect effects. The partial alternative is to discontinue take authorization on lands being donated or exchanged to the Forest Service, but not to extend take authorization to the lands acquired by Plum Creek within the Planning Area. Instead, newly acquired Plum Creek lands would be subject to section 9 of the ESA and State regulations. As this action is also not directly related to the land exchange or ongoing forest management, the majority of impacts are also indirect effects.

The areas have been previously covered by an appropriate field inventory and adequate records exist documenting the work by the Forest Service. Forest Service is not exchanging lands containing historic properties which are listed or eligible for listing under NHPA section 106. State Forest Practices regulations provide further protection. There are unlikely to be any direct effects on cultural resources that

would occur as a result of the modification of the HCP. Effects resulting from the land exchange have already been covered in a separate action. In fact, because of the additional protection of special habitats and because culturally rich areas are being transferred from Plum Creek to the Forest Service, it is likely that there is a net benefit to cultural resources as a result of the combination of the exchange and subsequent modification of the HCP. Indirect effects of this action are discussed below.

Archaeological Sites

Indirect effects to archaeological sites will depend on the type and distribution of such sites, and whether these sites will be managed under the Northwest Forest Plan or under Plum Creek management. The Final EIS for the I-90 Land Exchange addresses the distribution of these resources and that description of the resources and effects is herein incorporated by reference with respect to the no-action alternative and the action alternatives.

Indirect effects of the proposed modification include the harvest of timber in the vicinity of archeological sites where section 9 prohibitions to take would otherwise have restricted or eliminated harvesting. The effects also include the benefits of limited harvests under the HCP where State forest practices regulations would have allowed greater amounts of harvest, e.g., such as the buffers surrounding special habitats. Another impact could be the inadvertent destruction of artifacts by logging, road construction, and other land-management activities (on lands traded to Plum Creek) which would not have otherwise been able to occur in the absence of the HCP.

Indirect effects would differ somewhat between the partial HCP alternative and the proposed modification in that the proposed modification would provide enhanced protection where archaeological resources are found in association with special habitats and topographical features (e.g., talus slopes or meadows), but the partial alternative would not provide such protection.

Heritage resources associated with Kelly Butte, presently on National Forest System lands in the Green River watershed, would not be traded to Plum Creek and would remain under Federal protection under all alternatives. These include features such as historic trail segments and prehistoric lithic scatters. The action alternatives would result in greater land in Federal ownership in the Yakima River Basin where the concentration of known sites is greater. In the Green River Basin, less land would be under Federal management, but the difference in amount of land is relatively small. State protection for such sites would continue and coordination of such issues is expected to continue through the State Forest Practices Application process and the involvement provided through the Timber, Fish, and Wildlife Group.

Historic Properties

Washington State Forest Practices Regulations prohibit landowners from knowingly damaging historic properties and specifically protect "as-yet unrecognized resources" as well as National Register-eligible and listed properties. State rules also direct landowners to consult with affected Indian Tribes regarding the identification and treatment of historic properties in conjunction with forest practice applications. Therefore, properties transferred from National Forest System status to private ownership would receive some level of protection.

The actual effect of each alternative on historic properties depends not only on the number of properties affected, but on the particular qualities of individual affected properties with respect to the National

Register criteria (e.g., the potential for individual historic properties to yield information important in prehistory or history). These properties (unknown sites due to topography or duff layers) may be inadvertently destroyed or otherwise affected under all alternatives. The effect to unrecorded historic properties will remain unknown and unmitigated for all alternatives.

Action Alternatives

All lands to be transferred have been examined under the Forest Service's I-90 Land Exchange compliance with section 106 of the NHPA (Report to Plum Creek and Other NHPA Consulting Parties; USFS April 16, 1999). Only 2 historic properties (includes those properties listed or determined eligible for listing on the National Register for Historic Places) are proposed for exchange to Plum Creek at this time. Both of these are located outside the HCP Planning Area and are not a part of this action. This action of modifying the HCP will not extend authorization for incidental take of threatened or endangered species to any lands containing or abutting known historic properties which are listed or determined eligible for listing on the National Register of Historic Places.

No Action

Under the No-action Alternative, effects to documented historic properties are likely to result from the construction of Plum Creek's proposed access roads along National Forest System easements if the proposed land exchange does not occur. However, under both action alternatives, many such proposed access projects will be unnecessary.

Traditional Places

According to the Forest Service, no traditional cultural places have been identified on the proposed exchange lands to date. As discussed in USFS DEIS, an ethnographic study of the proposed project areas did not identify any traditional cultural properties. However, government-to-government consultation by the Forest Service is ongoing with federally recognized Indian Tribes with an interest in the project. Identified adverse effects to traditional cultural places of religious, spiritual, or ceremonial significance may be difficult to avoid or reduce because they may be strongly tied to specific locales whose integrity is critical to their value as traditional cultural places.

The Yakama have indicated in general terms that National Forest System parcels proposed for exchange are "culturally important and frequently used areas" within the Tribe's ceded and usual and accustomed area for hunting, berry picking, root gathering, etc. The Yakama have not identified specific hunting, gathering, root digging, berry picking, or medicinal plant gathering areas that would be affected by the proposed exchange. Members of the Muckleshoot Indian Tribe continue to use open and unclaimed lands in the Upper Green River area and consider this area to be one of their key watersheds. The Muckleshoot also have not identified specific areas of concern that would be affected by the exchange, but they have expressed a general concern for treaty rights and privileges and other interests in the Green River watershed.

All Alternatives

Under each of the action alternatives, Kelly Butte will be part of a new designated area, the Kelly Butte Special Management Area, which will be accessible to Muckleshoot and other Native People. This area

will be managed consistent with the values of cultural resources and traditional places. However, this special management area will not be established under the no-action alternative.

In addition, under all alternatives, the Planning Area can provide scenic views that remind many long-term residents and Native Peoples of their cultural roots, and thus have the effect of connecting them with their past. A "natural appearance" may serve as a type of heritage, then, and an important one at that. Such effects were also discussed under Visual Resources.

Cultural Resources

Most of the types of activities undertaken by Tribal members, e.g., hunting and gathering, cannot be physically bounded but are tied to habitats or plant communities. As the habitat and/or access to suitable plant communities changes and through judicious use of the resources through rotation, the hunting and gathering places change. Cedar and medicine plants are resources that are exhausted in one place. Bark is taken from trees not more than 12-25" in diameter and the tree cannot be stripped again. Medicine plants in old growth and second growth settings are reported to decline after clear cuts are established. Headwater streams may also change and impact use for spiritual activities. However, the cultural activity continues as Tribal members encounter a place that has been degraded and move to other places within the Planning Area. Unfortunately, those places are now limited.

In the No-action Alternative, there will be no change from the current situation. Plum Creek's management would continue under the HCP and impacts to cultural resources would be slight, albeit more activity would occur than under the Northwest Forest Plan. Forest management of Federal lands would continue under the Northwest Forest Plan and amended Forest Plans. Under the action alternatives, acquired Plum Creek lands would be managed according to either the HCP or State regulations. In both cases, State regulations will protect some resources. With the HCP, sensitive habitats are more likely to receive incidental protection.

4.11 RECREATION

The HCP Planning Area encompasses the central Cascades Mountain Range. This area is readily accessible for recreational use by residents from the Seattle metropolitan area and from communities in eastern Washington. Within the Planning Area, the Mt. Baker-Snoqualmie and Wenatchee National Forests provide numerous opportunities for recreation including: hiking, camping, picnicking, horseback riding, fishing, hunting, off-road vehicle use, mushrooming and berry picking, scenic driving, wildlife viewing, rock climbing, cross country and downhill skiing, snowshoeing, and snowmobiling. Off-road vehicle use and snowmobiling take advantage of the roads maintained by the Forest Service and Plum Creek.

Plum Creek's lands are an intricate part of the recreational resources within the central Cascades. Because of the "checkerboard" configuration of land ownership in the Planning Area, many of the trails and roads used by recreationists traverse Plum Creek's lands. Plum Creek maintains an "open" land policy for recreational use of its lands. In areas designated as "grizzly bear" subject to public closure to vehicles and gating to help prevent human encounters with grizzly bears.

Under all alternatives, Plum Creek's forest-management activities may affect access to recreational opportunities and or the perceived quality of the recreational experience within the Planning Area. The quality of a recreational experience could be affected by modifications of the "natural-appearing" landscape

by harvesting activities. Harvesting activities would reduce the wild, primitive, and remote experience for many recreationists. Conversely, roads constructed and maintained for forest-harvesting activities would provide access to many remote hiking and fishing trailheads, and during the winter, these roads would extend the network of roads for use by snowmobilers and cross-country skiers.

Each alternative proposes varying degrees of riparian protection, forest management, upland harvest deferrals, and road closures, all of which directly or indirectly enhance wildlife habitat. In turn, these measures may enhance some aspects of the recreational experience while diminishing others. In fact, regardless of the alternative considered, enhancing recreational opportunities for some may degrade the experience for others.

4.11.1 ALTERNATIVE 1 (NO ACTION)

Under the No Action Alternative, Plum Creek would not change its basic policy of permitting public use of its lands for recreational activities except in areas designated as “grizzly bear roads on these lands would be closed to the public and gated to prevent human encounters with grizzly bears. Road use would be restricted to Plum Creek staff for administrative and management operations. Therefore, the No Action Alternative would not effect recreational opportunities in the Planning Area.

4.11.2 ALTERNATIVE 2 (PARTIAL HCP) AND ALTERNATIVE 3 (PROPOSED ACTION)

Alternative 2 and the Proposed Action Alternative are similar to the No Action Alternative. Under both alternatives Plum Creek would maintain its basic policy of permitting public use of its lands for recreational activities except in areas designated as “grizzly bear country”. However, a large portion of the Planning Area formerly owned by Plum Creek and designated as “grizzly bear country” would be exchanged to the Forest Service and managed under the ~~NWFP~~ [amended Forest Plans](#) and their standards and guidelines for providing recreational opportunities in the Planning Area. ~~Therefore, Alternative 2 and the Proposed Action Alternative would have no effect on recreational opportunities in the Planning Area.~~ [In some areas of the National Forest, there could be restrictions in the level and type of recreation use permitted based upon the particular land allocations in effect.](#)

4.12 VISUAL RESOURCES

The visual quality of the Cascade Range is important to many individuals when viewing the landscape from I-90 or when participating in recreational activities such as cross-country skiing, and hiking. A landscape moderately or heavily altered by humans can be perceived by some individuals to have a “low” visual quality.

The existing visual condition of Snoqualmie Pass, within the Mt. Baker-Snoqualmie National Forest has been classified as Moderately Altered in some areas and Heavily Altered in others. Within the Wenatchee National Forest, the Little Naches River, Cle Elum Valley, and Cle Elum and Kachess Lakes have been classified as Slightly Altered; Keechelus Lake has been classified as Moderately Altered; and Lost and Cooper Lakes have been classified as Natural Appearing.

The current landscape patterns observable from I-90 reflect timber-management practices conducted by Plum Creek, the Forest Service, and other landowners. However, forest practices in Washington have

changed dramatically in the last two decades and the signs of past practices will diminish rapidly. Replanted harvest units will mature and the linear patterns exhibited by harvest units and roads will become less evident and past disturbances in the Planning Area will begin to blend into the natural environment. Additionally, current and future forest-management practices in the Planning Area would eliminate large rectilinear harvest units, thereby improving the visual quality of the landscape.

Under all alternatives, implementation of the ~~NWFP~~ amended Forest Plans on Federal lands and implementation of the HCP and Environmental Principles on Plum Creek's lands would ~~minimize~~ reduce visual impacts and current visual impacts would diminish in the future.

4.13 TRUST RESPONSIBILITY AND TREATY RIGHTS

The Services recognize the Trust responsibilities owed to Tribes concerning treaty resources. Effects to specific resources and protection of those resources are addressed in Plum Creek's HCP and in the accompanying DEIS and FEIS. The Services believe that Plum Creek's HCP increases the amount of protection to resources of concern to Tribes when compared to proceeding under State Forest Practices Rules and Regulations. Tribal representatives have participated on every watershed analysis conducted in the Planning Area and continued Tribal participation is explicitly guaranteed by Plum Creek's HCP. The FEIS for Plum Creek's HCP clarifies that nothing in the HCP, incidental take permit, or IA is intended to limit the Services' Trust responsibilities to Native Americans. Further, consistent with Secretarial Order No. 3175, dated November 8, 1993, and the President's memorandum regarding Government-to-Government Relations with Native American Tribal Governments, published in the Federal Register on May 4, 1994, the Services are continuing to consult with the affected Tribes. The Services intend to ensure the involvement of the affected Tribes in the continued implementation of the HCP.

For all Federal lands, the American Indian Religious Freedom Act (AIRFA) of 1978, Public law 95-431, establishes as United States policy, the protection and preservation of American Indians' "freedom to believe, express, and exercise the traditional religions...including but not limited to access to sites, use, and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites" (42 USC 1996). In 1981, in response to the passage of the AIRFA, the Forest Service produced an inventory of Native American religious uses, practices, localities, and resources on the Mt. Baker-Snoqualmie National Forest. In 1997, an ethnographic study was completed in the vicinity of the HCP recognized Tribes regarding additional uses in the vicinity of the HCP Planning Area was initiated in July 1997, and is ongoing (see Section 3.8.2.1, Reserved Indian Rights and the Forest Service Trust Responsibilities, FEIS, Green River Access Requests, 1998).

A variety of resources can be considered as Treaty or Trust resources. Impacts described elsewhere in this document for fish and wildlife, as well as vegetation, are also impacts to Trust resources. Those sections are incorporated by reference.

No Action Alternative

Under the No-action Alternative, there would be no net loss, gain, or geographic shift to open and unclaimed lands in any of the treaty ceded areas, however, there may be effects to fish, wildlife, and plant resources from the construction of Plum Creek's proposed access roads on Forest System easements if the proposed land exchange does not occur. Under the No-action Alternative, Plum Creek would require Forest

Service easements to construct timber access roads across National Forest Lands. There would be no net loss, gain, or geographic shift to open and unclaimed lands in any of the treaty ceded areas from the No-action Alternative. Effects to fish, wildlife populations, and plant resources that may indirectly affect the meaningful exercise of treaty rights and privileges of the Yakama and Muckleshoot are addressed in Sections 4.5, 4.6, 4.7, and 4.8.

Action Alternatives

There would be no violation of the treaty rights of Indian Tribes under either alternative involving the proposed land exchange. The treaty-reserved right to take fish from "usual and accustomed grounds and stations" within the project areas is a property right or encumbrance on the land which transfers with the land from federal to private ownership. This right would not be directly affected by the land exchange. However, previous court decisions have ruled that treaty-reserved privileges to hunt and gather on open and unclaimed lands defease if the lands are transferred out of public ownership. Therefore, access for hunting and gathering to National Forest System open and unclaimed lands cannot be guaranteed if those lands are transferred to Plum Creek. Access to treaty resources has an important issue for several Indian groups. To the degree that Plum Creek grants access to Indian groups with treaty-reserved privileges on open and unclaimed land, this effect may be reduced or avoided.

Under the action alternatives, there would be a net loss of National Forest System lands considered to be open and unclaimed within the Green River. There would be a net gain of National Forest System lands considered to be open and unclaimed within Yakima River Basin. In addition to the effects of changes in open and unclaimed lands, there could be indirect effects to the meaningful exercise of Indian treaty rights and privileges under the action alternatives. In particular, there could be some effects to fish, wildlife, and plant resources within the Green River watershed, which would have the most direct effect on Tribes. Conversely, there could be beneficial effects to these resources on the east side of the Cascade Crest within the Yakima Treaty ceded area, which would probably have the most direct effect on the Yakama Indian Nation.

4.14 CUMULATIVE EFFECTS

Cumulative effects (as defined by NEPA) of the No Action Alternative and of a land exchange such as the exchange analyzed in Alternatives 2 and 3 have been addressed in the HCP, HCP DEIS, and FEIS; and (as defined by ESA) in the U.S. Fish and Wildlife Service and National Marine Fisheries Service Biological Opinions. The U.S. Fish and Wildlife Service concluded that, "After reviewing the current status of northern spotted owl, marbled murrelet, grizzly bear, gray wolf, bald eagle, and peregrine falcon; the environmental baseline for the action area; the effects of the proposed plan (*i.e.*, *Plum Creek's HCP*); and the cumulative effects; it is the Service's biological opinion that the issuance of the ITP, and execution of the IA implementing the proposed HCP are not likely to jeopardize the continued existence of the aforementioned species, and is not likely to destroy or adversely modify designated critical habitat." (Intra-Service Biological Opinion, June 24, 1996). The National Marine Fisheries Service concluded that, "Considering the possible cumulative effects to anadromous salmonids, the conservation measures identified in this HCP either minimize, or mitigate these effects to the maximum extent practicable. Habitat for sensitive life stages of anadromous salmonids will be increased by the measures identified in this HCP. (NMFS Unlisted Species Analysis, June 25, 1996)."

Under Alternative 2 (Partial HCP) and Alternative 3 (Proposed Action) the Forest Service would exchange approximately ~~17,000~~ **15,800** acres of National Forest System lands for approximately ~~53,400~~ **50,000** acres of lands owned by Plum Creek. The direct indirect and cumulative effects of the land exchange have been addressed in the DEIS for the land exchange (USDA DEIS 1998). Among these lands, approximately ~~10,800~~ **10,200** acres of the National Forest System lands and all of Plum Creek's lands offered in the land exchange are within the HCP Planning Area. Neither alternative requires a change in the boundaries of the HCP Planning Area, nor do they result in an increase in the level of "incidental take" authorized under the existing Incidental Take Permit. Furthermore, Plum Creek would continue to receive regulatory assurances pursuant to its properly implemented HCP for all species that are "adequately covered" in the HCP.

As a direct result of implementation of the Partial-HCP or the Proposed Action Alternative, National Forest System lands would be consolidated in the central Cascades region and managed under the Northwest Forest Plan for late-successional, old growth, or Matrix forest characteristics. A large portion of lands acquired by the Forest Service would be managed in accordance with the SPAMA. Under SPAMA, the newly acquired Federal lands would be managed to provide habitat for organisms associated with late-successional forests, and to contribute to critical wildlife connectivity objectives of the AMA. ~~the lands would be managed to provide a distribution of forest age and structural classes and stream environments that provide habitat for late successional and old growth plant and wildlife species on National Forest System lands.~~ The increased land base of National Forest System lands in the Planning Area would enhance connectivity between north/south habitats in the central Cascades through a combination of Federal management guidelines and habitat deferrals on private lands. Improved landscape connectivity would increase the size of habitat reserves in the central Cascades, allow them to function more effectively as an interconnected system, and enhance long-term viability of wildlife populations.

Lands acquired by Plum Creek within the Planning Area would be managed in accordance with the Company's HCP under the Proposed Action Alternative, and in accordance with both the HCP and State Forest Practice Rules and Regulations under the Partial-HCP Alternative. The larger National Forest System land base in the Planning Area would reduce the harvestable area and therefore, reduce cumulative effects associated with harvest operations. The management strategy that the Forest Service would implement on National Forest Service lands would be supplemented by implementation of Plum Creek's HCP Alternative 3 (Proposed Action) and a combination of management regimes including the HCP and State Forest Practice Rules and Regulations (Alternative 2; Partial-HCP). Implementation of either strategy (i.e., Partial-HCP or Proposed Action) would increase the potential success of the NWFP, would be consistent with final Draft Recovery Plan for the Northern Spotted Owl, would be consistent with the objectives of SPAMA, and would minimize cumulative effects by ensuring that management in accordance with the HCP is compatible with management on adjacent National Forest System lands.

Past actions include fires, logging, road building, and previous land exchanges. These actions and natural events have resulted in the current condition. Cultural resource surveys are being conducted for the proposed access roads in the Mt. Baker-Snoqualmie and Wenatchee National forests and were completed on parcels within National Forest System lands included in the Huckleberry Land Exchange. Surveys were apparently not conducted for past land exchanges. There could have been be additional unrecorded historic properties transferred out of Federal protection or impacted by past Forest Service or private actions (e.g., subsurface properties or those obscured by forest duff or heavy undergrowth during field surveys).

Many of the archaeological resources of the area are unique. They may provide the sole record of a former environment or past way of life. However, these sites are part of a diminishing, nonrenewable resource

Environmental Consequences

base. Cumulative adverse effects on the archaeological resource could result from a combination of impacts resulting from natural deterioration, road construction, and repeated logging of an area. The exact extent of this loss has not been determined.

Land-management strategies implemented by the various ownerships in the Planning Area provide differing levels of protection to important sites/habitats, including openings, meadows, rivers and riparian zones, woodlands, and huckleberry fields.

Resources would be at risk of impact on Federal lands from proposed access rights-of-way across Federal lands. Impacts would also occur from logging and other activities on lands transferred to Weyerhaeuser (Huckleberry Land Exchange). Furthermore, only very limited surveys of heritage resources have been completed on Plum Creek and Weyerhaeuser lands that would be transferred to the National Forest System. Therefore, the cumulative beneficial effects to cultural resources that would be brought into Federal protection cannot be quantified.

While more-recent, land-management practices such as clearcut logging have been implemented widely, the data suggest that culturally significant plants remain available throughout the vicinity, some species are especially available on Federal lands where road building and timber harvest has been delayed. Like fire, timber harvesting effects the nature of the forest and thus has impacted the abundance of foods and medicines. During the last century or so, the introduction of livestock and the active suppression of fires combined to give the forest a new appearance. Stands of trees became heavily stocked, for the lack of fire helped to maintain the forests' density. Today, heavily stocked stands are typical in the eastern Cascades. As a result of timber harvest, more sunlight penetrates the forest canopy resulting in changes in the composition of plant communities. Roads may introduce edge effects to penetrated stands and serve as an avenue for introduction of exotic weeds which may impact native plants. In the past, meadows may have dried out and seeps and springs may have been altered or destroyed due to poorly planned roads. Taken as a whole, foods and medicines are probably less abundant today than they were in the past.

Native People burned areas such as meadows to encourage huckleberries, blackberries, and browse for deer and horses. These may have been intentional aspects of traditional harvest practices designed to enhance the conditions and populations of plants and animals. It is know for example, that many traditional huckleberry gathering areas were customarily managed by controlled burning. Traditional human-induced effects could also be a direct result of harvest practice, such as peeling bark from trees, removal of plants from populations through digging up roots (or other underground parts or entire aerial parts, as well as collecting flowers and leaves. These might reduce the availability of the resources or enhance them through thinning. Many of the meadows have diminished in size or disappeared with the cessation of burning. Historic, modern, and recent logging activity has produced cleared areas, most replanted with native trees by the Federal government or private timber companies.

The botanical record indicates that, even today, after extensive non-Indian use impacts, populations of culturally significant plant species remain in pockets of old-growth coniferous forest, high-elevation dry meadows, small deciduous wetlands, rocky non-forested outcrops, and even in some mid-successional forests. The ecological record tells the story of changes to habitats over time. These include natural disturbances, primarily fire. Other types of natural disturbances relevant to a middle-elevation, montane environment include wind, lightning, avalanche, ice storm, and infestation events. These can significantly alter soil, light, and topographic conditions as well as change the composition and structure of plant communities.

Since traditional harvest/gathering locations may have moved as a result of natural disturbance (such as avalanche, wind storms, and fire) as well as human disturbance (such as cumulative effects of previous harvesting or conscious "conservation" strategy), disturbances in one area could instigate either temporary or permanent moves to other areas perhaps with similar habitats and plant communities. In this way, an adequate supply of plant material could be maintained and harvest sites could regenerate. A certain resiliency is demonstrated here both ecologically and culturally. As sustainable harvest is implemented, new appropriate areas are located and cultural tradition is maintained.

4.15 CONCLUSION

The HCP modification is a product of the I-90 Land Exchange. The potential effects of the land exchange are significantly ameliorated by the existence of the HCP. However, the distribution of lands being exchanged, in conjunction with the differences between management scenarios, induces a series of benefits and impacts. Management of Federal lands under the NWFP and Plum Creek's management under the HCP are different. They both share many common objectives, while some objectives are different. Plum Creek's management east of the Cascade Crest is more like Federal management than its management west of the Cascade Crest. Relatively speaking, management on the west side includes shorter rotations, more even-aged management, and slightly smaller buffers on some nonfish-bearing streams. On the east side, rotations tend to be longer, additional silvicultural options are available and utilized, and all perennial streams receive at least 100-foot buffers. Specifically, management within the I-90 Lakes area is also constrained by management for the grizzly bear, including road density targets and road closures.

Land exchange concerns seem to focus on the species, which utilize mature forest with structure and healthy riparian systems. On the east side, the exchange will affect many acres in a marginally positive manner. Even here, some tradeoffs exist. Not all species will benefit from Federal management. Ungulates such as deer and elk may not enjoy the same mixture of forage and hiding cover that would have been expected without the exchange. Given the management, which was expected to occur on these lands under the HCP, any benefits expected from this exchange will be slight. However, those slight benefits would be multiplied across many thousands of acres.

On the west side, where the difference between Federal and HCP management is somewhat more distinct, the effects of the exchange would be viewed as impacts. These impacts are not severe for any resource category in any location, partially due to the ameliorating effects of the HCP. However, there are resource categories that may not be as "well off" after the land exchange as they were before the exchange. The impacts expected on the west side are expected on relatively fewer acres than the benefits expected on the east side. Here, too, there are tradeoffs. There will be a net gain of about 3,000 acres (including a net gain of 6 miles of streams) in Plum Creek's ownership on the west side. While Plum Creek is acquiring land on the west side, the Forest Service will also acquire some lands on the west side, such as lands around Kelly Butte. There are resource categories that will benefit from the more-conservative management of the Kelly Butte Special Management Area, which will offset, somewhat, minor impacts, which may occur elsewhere.

Another difficulty is the subtlety of impacts/benefits. Federal lands contain Riparian Reserves, which are slightly wider than Plum Creek's RHAs. If it were not for the HCP, one could easily conclude there would be substantial impacts. For instance, nonfish-bearing perennial streams have 150-foot buffers measured on the slope under the NWFP, yet these same streams would not be protected under State Forest Practices Rules and Regulations. In contrast, the HCP would generally leave buffers of 100 feet measured horizontally on such streams. In most situations, this will be close to the buffer widths left under Federal

management because of the slope. Federal buffers are “no harvest” buffers until adaptive management is applied. HCP buffers allow management, which is expected to be almost negligible to beneficial, however, adaptive management under the HCP could make riparian treatments even more conservative. In this context, it must be acknowledged that buffers and other actions or lack of actions are more conservative on Federal lands. This cannot be denied. However, these differences do not automatically result in impacts, especially not measurable or quantifiable impacts. The final result is more a matter of probability. The question is what are the probabilities of having impacts on resources such as water quality as a result of timber harvest where the buffer is 150 feet up the slope, as opposed to when it is 125-130 feet up the slope. The greatest benefit from buffers generally comes from the area closest to the stream with a decreasing rate of return as the distance from the stream increases.

This HCP modification embodies the same tradeoffs created by the land exchange. Some near-inconsequential decreases in protection will occur on a relatively small amount of land. Even fewer benefits will accrue on a significantly larger amount of land. This will be the situation for most resource categories and for wildlife which depend on mature forest with structure, whether such stands are in the uplands, riparian areas, or surrounding special habitats. However, some resource topics and wildlife, which rely on early successional stages or a juxtaposition of early and late successional stages, will not benefit.

The land exchange modification will not eradicate the checkerboard pattern from the Green and Yakama River Basins. Some areas will become large blocks of contiguous ownership, some areas will become small blocks, and other area will remain in checkerboard. If one pattern is viewed as detrimental and another beneficial for certain species, those species will likely still have available the most advantageous combinations of ownership patterns in some portions of the Planning Area.

All of these factors considered, the HCP is still a single document dealing with a single Planning Area. The amount of mature forest with structure and healthy riparian systems seem to remain neutral at best or improve slightly. The HCP document remains a “living document” by incorporating the principles of flexibility and cooperation, as well as the explicit use of adaptive management. The ability to “go where the science leads” will continue to be an integral part of the HCP regardless of the ownership pattern.

LIST OF PREPARERS

DSEIS

William Vogel, Interdisciplinary Team leader
Wildlife Biologist
U. S. Fish and Wildlife Service
Olympia, Washington

Jon Hale
Wildlife Biologist/NEPA Analyst
U.S. Fish and Wildlife Service
Olympia, Washington

Susan Meyer
Environmental Planner
Foster Wheeler Environmental Corporation
Bellevue, Washington

Steven T. White, Ph.D.
Principal Scientist,
Bellevue, Washington

FSEIS

William Vogel
Wildlife Biologist
U. S. Fish and Wildlife Service
Olympia, Washington

Steven T. White, Ph.D.
Scientist/Technical Writer
Bellevue, Washington

DSEIS DISTRIBUTION LIST

March, 1999

1.1 FEDERAL

DEPARTMENT OF AGRICULTURE

U.S. Forest Service

Sonny O'Neal

Catherine Stephenson

Rudy Edwards

John Lemkuhl

Dennis Bschor

Jim Pena

Floyd Rogalski

U.S. ENVIRONMENTAL PROTECTION AGENCY

Region 10

Andrew Smith

U.S. DEPARTMENT OF COMMERCE

NOAA

U.S. DEPARTMENT OF INTERIOR

USFWS

FEDERAL LEGISLATORS

1.2 STATE

DEPARTMENT OF FISH AND WILDLIFE

Timothy Quinn

Cindy Confer

Ken Bevis

Don Nauer

DEPARTMENT OF NATURAL RESOURCES

John Edwards

Chuck Turley

STATE LEGISLATORS

1.3 COUNTY

KITTITAS COUNTY COMMISSIONERS

Max Galloday

Mary Stubert

William Hinkle

1.4 CITY

CITY OF CLE ELUM

Bary Berndt

CITY OF SOUTH CLE ELUM

Jim Devere

CITY OF ELLENSBURG

Larry Mattson

CITY OF ROSLYN

Jack Denning

1.5 TRIBAL

MUCKLESHOOT INDIAN TRIBE

Virginia Cross

Rod Malcolm

Patrick Reynolds

Chantal Stevens

NORTHWEST INDIAN FISHERIES

Janet Burcham

PUYALLUP TRIBE OF INDIANS

Jeff Thomas

TULALIP TRIBE

Paul Kennard

YAKAMA INDIAN NATION

Carrol Palmer

Jim Stevenson

Jim Mathews

1.6 ORGANIZATIONS: ENVIRONMENTAL AND RECREATIONAL

ALPS

Len Gardner

AUDUBON SOCIETY

Beverly Blinn

Timothy Cullinan

Marianne Gordon

David Jennings

Bonnie Philips-Howard

Helen Engle

CENTRAL CASCADES ALLIANCE

Jay Letto

DEFENDERS OF WILDLIFE

William Snape III

ENVIRONMENTAL DEFENSE FUND

Michael Bean

**FOUNDATION FOR HABITAT
CONSERVATION**

Gary Smith

**KETTLE RANGE CONSERVATION
GROUP**

Timothy Coleman

MOUNTAINEERS

Norm Winn

Craig Rowley

NATIONAL WILDLIFE FEDERATION

Sybil Ackerman

1.7 INDUSTRIAL

NORTHWEST FOREST ASSOCIATION

Bob Dicks

WASHINGTON FOREST PROTECTION ASSOCIATION

Bill Wilkerson

NORTHWEST ECOSYSTEM ALLIANCE

David Werntz

Liz Tanke

**NORTHWEST MOTORCYCLE
ASSOCIATION**

Scott Taylor

AMERICAN LANDS ALLIANCE

Daniel Hall

RIVER COUNCIL OF WASHINGTON

Brook Drury

**SIERRA CLUB—CASCADE
CHECKERBOARD PROJECT**

Charlie Raines

EARTH JUSTIC LEAGUE

Kristin Boyles

**WASHINGTON ENVIRONMENTAL
COUNCIL**

Toby Thaler

Becky Kelley

**WASHINGTON NATIVE PLANT
SOCIETY**

Jerry Davison

WILDERNESS SOCIETY

Steve Whitney

1.8 UNIVERSITIES/LIBRARIES

UNIVERSITY OF WASHINGTON

- Dr. Jerry Franklin (Forest Resources)
- Dr. Gordon Orians (Zoology)
- Dr. Estella Leopold (Paleobotany)

UNIVERSITY OF IOWA

Andy Asell

UNIVERSITY OF NORTH TEXAS

Sarita Bhatia

- UNIVERSITY OF MONTANA LIBRARY
- UNIVERSITY OF WASHINGTON LIBRARY
- WENATCHEE PUBLIC LIBRARY
- SEATTLE PUBLIC LIBRARY, GOV. PUBLICATIONS DEPT.
- EVERGREEN STATE COLLEGE LIBRARY
- CENTRAL WASHINGTON UNIVERSITY LIBRARY
- KING COUNTY LIBRARY SYSTEM – BELLEVUE
- KING COUNTY LIBRARY – NORTH BEND
- ENUMCLAW PUBLIC LIBRARY

1.9 INDIVIDUALS

Mitch Baker	Becky Herbig	Donald Seaman
Ellie Belew	Lucie Huong	Wade Sewell
John Bigas	Will Johnson	Stan Sovern
Melanie Bojanowski	Keith Kistler	Brenda Senturia
Brian Booth	Mark Lawler	Edward Syrjala
Mark Boyar	Joe Leysath	Don Theoe
Brad Carlquist	Troy Locati	Cindy Thieman
Jim Chapman	Donald & Linda Parks	John Titus
Arthur Day	Suzan Parr	Mike Town
Henry Fraser	Randy Payne	Moris Ubelacker
Bob Harns	William Scott	Robert Watter
Stan Hays	Edward Schullywest	Bob Weeks
Ben Hayward		

1.10 CONTRIBUTORS TO THE HCP MODIFICATIONS

- PLUM CREEK TIMBER COMPANY, L.P.
- FOSTER WHEELER ENVIRONMENTAL CORPORATION
- BRODIE GROUP
- PERKINS-COIE

FSEIS DISTRIBUTION LIST

March, 1999

1.1 FEDERAL

DEPARTMENT OF AGRICULTURE

U.S. Forest Service

Sonny O'Neal
Catherine Stephenson
Rudy Edwards
John Lemkuhl
Dennis Bschor
Jim Pena
Floyd Rogalski

U.S. ENVIRONMENTAL PROTECTION AGENCY

Region 10

Anna Marie Muñoz

FEDERAL LEGISLATORS

Senator Patty Murray

1.2 STATE

DEPARTMENT OF FISH AND WILDLIFE

Joe Buchanan
Timothy Quinn
Cindy Confer
Ken Bevis
Don Nauer

DEPARTMENT OF NATURAL RESOURCES

John Edwards
Chuck Turley

1.3 COUNTY

KITTITAS COUNTY COMMISSIONERS

Max Galloday
Mary Stubert
William Hinkle

1.4 CITY

CITY OF CLE ELUM

Bary Berndt

CITY OF SOUTH CLE ELUM

Jim Devere

CITY OF ELLENSBURG

Larry Mattson

CITY OF ROSLYN

Jack Denning

1.5 TRIBAL

MUCKLESHOOT INDIAN TRIBE

John Daniels, Jr.

David Vail

Laura Weeks

Isabel Tinoco

Karen Walters

Roderick Malcom

Patrick Reynolds

Chantal Stevens

PUYALLUP TRIBE OF INDIANS

Jeff Thomas

TULALIP TRIBE

Paul Kennard

YAKAMA INDIAN NATION

Carrol Palmer

Jim Stevenson

Jim Mathews

1.6 ORGANIZATIONS: ENVIRONMENTAL AND RECREATIONAL

ALPS

Len Gardner
Jim Chapman

AUDUBON SOCIETY

Timothy Cullinan

DEFENDERS OF WILDLIFE

William Snape III

ENVIRONMENTAL DEFENSE FUND

Michael Bean

**FOUNDATION FOR HABITAT
CONSERVATION**

Gary Smith

**KETTLE RANGE CONSERVATION
GROUP**

Timothy Coleman

MOUNTAINEERS

Norm Winn

NATIONAL WILDLIFE FEDERATION

Sybil Ackerman

NORTHWEST ECOSYSTEM ALLIANCE

David Werntz

AMERICAN LANDS ALLIANCE

Daniel Hall

RIVER COUNCIL OF WASHINGTON

Brook Drury

SIERRA CLUB—CASCADE

CHECKERBOARD PROJECT

Charlie Raines

EARTH JUSTICE LEAGUE

Kristin Boyles

**WASHINGTON ENVIRONMENTAL
COUNCIL**

Toby Thaler

Becky Kelley

WASHINGTON FOREST LAW CENTER

Peter Goldman

WILDERNESS SOCIETY

Steve Whitney

1.9 INDUSTRIAL

NORTHWEST FORESTRY ASSOCIATION

Bob Dick

WASHINGTON FOREST PROTECTION ASSOCIATION

Bill Wilkerson

1.10 UNIVERSITIES/LIBRARIES

UNIVERSITY OF WASHINGTON

Dr. Jerry Franklin (Forest Resources)

UNIVERSITY OF IOWA

Andy Assell

UNIVERSITY OF NORTH TEXAS

Sarita Bhatia

UNIVERSITY OF MONTANA LIBRARY

UNIVERSITY OF WASHINGTON LIBRARY

WENATCHEE PUBLIC LIBRARY

SEATTLE PUBLIC LIBRARY, GOV. PUBLICATIONS DEPT.

EVERGREEN STATE COLLEGE LIBRARY

CENTRAL WASHINGTON UNIVERSITY LIBRARY

KING COUNTY LIBRARY SYSTEM – BELLEVUE

KING COUNTY LIBRARY – NORTH BEND

ENUMCLAW PUBLIC LIBRARY

1.9 INDIVIDUALS

David Adams

Ben Hayward

Donald and Linda Parks

Robert Watz

1.10 CONTRIBUTORS TO THE HCP MODIFICATIONS

PLUM CREEK TIMBER COMPANY, L.P.

FOSTER WHEELER ENVIRONMENTAL CORPORATION

BRODIE GROUP

PERKINS-COIE

ABBREVIATIONS, ACRONYMS, AND DEFINITIONS

ABBREVIATIONS AND ACRONYMS

ACS	Aquatic Conservation Strategy	NAAQS	National Ambient Air Quality Standards
AIRFA	American Indian Religious Freedom Act	NEPA	National Environmental Policy Act
AMA	Adaptive Management Area	NHPA	National Historic Preservation Act
BMP	Best Management Practice	NMFS	National Marine Fisheries Service
DBH	Diameter at Breast Height	NRF	Nesting, Roosting, and Foraging
DCA	Designated Conservation Area	NWFP	Northwest Forest Plan
DF	Dispersal Forest	OG	Old Growth
DNR	Washington State Department of Natural Resources	PT	Pole Timber
DEIS	Draft Environmental Impact Statement	RHA	Riparian Habitat Area
DSEIS	Draft Supplemental Environmental Impact Statement	RLTA	Riparian Leave Tree Area
EA	Environmental Assessment	RM	River Mile
EIS	Environmental Impact Statement	RMZ	Riparian Management Zone
ESA	Endangered Species Act	ROD	Record of Decision
FD	Foraging/Dispersal	RSPF	Resource Selection Probability Function Model
FEIS	Final Environmental Impact Statement	RVD	Recreation Visitor Days
FWS	U. S. Fish and Wildlife Service	SEIS	Supplemental Environmental Impact Statement
HCP	Habitat Conservation Plan	SI/SS	Stand Initiation/Shrub Sapling
IA	Implementation Agreement	SIP	State Implementation Plan
ITP	Incidental Take Permit	SPAMA	Snoqualmie Pass Adaptive Management Area
LSR	Late Successional Reserve	WAU	Watershed Administrative Unit
MF	Mature Forest	WDFW	Washington Department of Fish and Wildlife
MOG	Managed Old Growth	YF	Young Forest

DEFINITIONS

Services - The U. S. Fish and Wildlife Service and National Marine Fisheries Service

Permit - Authorization (Incidental Take Permit) which allows nonfederal entities to take federally listed wildlife species if such taking is “incidental to, and not the purpose of, the carrying out of an otherwise lawful activity”.

Habitat Conservation Plan - Under Section 10(a)(2)(A) of the Endangered Species Act (ESA) any applicant applying for and incidental take permit must submit a "conservation plan" that specifies, among other things, the impacts that are likely to result from the taking and measures the applicant will undertake to minimize and mitigate such impacts. In the context of this document, it is the Plan submitted by Plum Creek in partial fulfillment of the requirements for an incidental take permit.

Watershed Analysis - Standard methodology developed by the Washington State Forest Practices Board that involves detailed evaluation of hydrology, streams, fish habitat, riparian habitat, landslides, erosion, and road-building constraints.

LITERATURE CITED

- Almack, J.A., W.L. Gaines, R.H. Naney, P.H. Morrison, J.R. Eby, G.F. Wooten, M.C. Snyder, S.H. Fitkin, and E.R. Garcia. 1993. North Cascades Grizzly Bear Ecosystem Evaluation: Final Report to the Interagency Grizzly Bear Committee, Denver, Colorado. 156 pp.
- Brown, E.R. (tech. ed.). 1985. Management of Wildlife and Fish Habitats in Forests of Western Oregon and Washington. USDA, Forest Service, Publ. No. R6-F&WL-192. Portland, Oregon.
- BIA and YIN. 1993. Environmental Assessment for the proposed Yakima Indian Reservation Forest Management Plan 1993-2002. Bureau of Indian Affairs and Confederated Tribes and Bands of the Yakama Indian Nation. September 1993.
- Easterbrook, D.J. and D.A. Rahm. 1970. Landforms of Washington. 156 p., illus. Bellingham, Washington. Union Printing Company.
- Eloheimo, M. 1999. Muckleshoot Indian Tribe Plum Creek Land Exchange Ethnobotanical Resource Gathering: Places, Practices, & Patterns. Initial Report of Findings, Supplemental to LAAS Traditional Cultural Places Report. Muckleshoot Indian Tribe. 27 pgs.
- Forsman, E.D., S.G. Soren, D.E. Seaman, K.J. Maurice, M. Taylor, and J.J. Zisa. 1996. Demography of the Northern Spotted Owl on the Olympic Peninsula and East Slope of the Cascades Range, Washington. Studies in Avian Biology. No. 17: 21-30.
- Herter, D.R., L.L. Hicks, and B.D. Melton. 1995. Review Process for Spotted Owl Site Centers in the Plum Creek Cascades HCP Project Area. Plum Creek Timber Co., L.P., Tech. Rept. No. 3. Seattle, Washington.
- Irwin, L. and L.L. Hicks. 1995. Estimating Potential Impacts of Timber Harvesting on Spotted Owl in the Plum Creek Cascades HCP Project Area. Plum Creek Timber Co., L.P., Tech. Rept. No. 6. Seattle, Washington. 38 pp.
- Jensen, S. 1995. Ecological Habitat Classification, HCP Project Area. Plum Creek Timber Company, L.P., Tech. Report No. 7. Seattle, Washington. 134 pp.
- Larson, L.L. 1999. The Muckleshoot Indian Tribe Huckleberry and Plum Creek Land Exchanges Traditional Cultural Places Study: Initial Report of Findings. Larson Anthropological Archaeological Services Limited and Muckleshoot Indian Tribe. February 26, 1999. 35 pgs.
- Leonard, W.P., H.A. Brown, L.L. Jones, K.R. McAllister, and R.M. Storm. 1993. Amphibians of Washington and Oregon. Seattle Audubon Soc., Seattle, Washington. 168 pp.
- Lujan, M., D.R. Knowles, J. Turner, and M. Plenart. 1992b. Recovery Plan for the Northern Spotted Owl - Final Draft. USDI, Fish and Wildlife Service, Portland, Oregon.

- Lundquist, R.W. and L.L. Hicks. 1995. Development of a Wildlife-Habitat Relationship Matrix for the Plum Creek Habitat Conservation Plan. Plum Creek Timber Company, L.P., Tech. Rept. No. 9. Seattle, Washington. 119 pp.
- Lundquist, R.W., V.S. Kelly, S.T. White, and R. Fleming. 1995. Assessment of Special Emphasis Wildlife Species and Other Wildlife Species of Concern for the Plum Creek Habitat Conservation Plan. Plum Creek Timber Company, L.P., Tech. Rept. No. 8. Seattle, Washington. 74 pp.
- Muckleshoot Indian Tribe. 1999. Muckleshoot Indian Tribe Huckleberry and Plum Creek Land Exchanges Traditional Cultural Places Study, Initial Report of Findings.
- NOAA National Marine Fisheries Service. 1996. Anadromous Salmonid Unlisted Species Analysis and Findings for the Plum Creek Timber Company's Habitat Conservation Plan and Unlisted Species Agreement. USDC, NOAA, NMFS Environmental and Technical Services Division, Portland, Oregon.
- Nussbaum, R.A., E.D. Brodie, Jr., and R.M. Storm. 1983. Amphibians and Reptiles of the Pacific Northwest. Univ. Press Idaho, Idaho Res. Found., Moscow, Idaho. 331 pp.
- Ohmann, J.L., W.C. McComb, and A.A. Zumrawi. 1994. Snag abundance for primary cavity nesting birds on nonfederal lands in Oregon and Washington. *Wildlife Soc. Bull.* 22:607-620.
- Parker, P.L. and T.F. King. 1990. Guidelines for Evaluating and Documenting Traditional Cultural Properties. National Register Bulletin No. 38. U.S. Department of the Interior. 22 pp.
- Plum Creek Timber Company, L.P. 1996. Multi-Species Habitat Conservation Plan on Forestlands owned by Plum Creek Timber Company, L.P. in the I-90 Corridor of the Central Cascades Mountain Range, Washington. Plum Creek Timber Company, L.P., Seattle, Washington.
- Plum Creek Timber Company. 1998. Draft Description and Analysis of Minor Modifications to Plum Creek Timber Company's Central Cascades Habitat Conservation Plan. Plum Creek timber Company, Seattle, Washington.
- Tacoma Public Utilities. 1998. Tacoma Water Habitat Conservation Plan - Green River Water Supply Operations and Watershed Protection. Working Draft. November 3, 1998.
- Thomas, J. (tech. ed.). 1979. Wildlife Habitats in Managed Forests: the Blue Mountains of Oregon and Washington. USDA, Forest Service Agri. Handbook No. 553. 512 pp.
- Thomas, J., E.D. Forsman, J.B. Lint, E.C. Meslow, B.R. Noon, and J. Verner. 1990. A Conservation Strategy for the Northern Spotted Owl. Interagency Scientific Committee to Address the Conservation of the Northern Spotted Owl. USDA, Forest Service, USDI, Bureau of Land Management, USDI, Fish and Wildlife Service, and National Park Service. Portland, Oregon. U.S. Government Printing Office 791-171/20026, Washington, D.C.

- Thomas, J.W., M.G. Raphael, R.G. Anthony, (and others). 1993. Viability Assessment and Management Considerations for Species Associated with Late-successional and Old Growth Forests of the Pacific Northwest. The Report of the Scientific Analysis Team. USDA Forest Service, National Forest System, Forest Service Research, Portland, Oregon. 530 pp.
- USDA Forest Service. 1990. Final Environmental Impact Statement and Land and Resource Management Plan. Mt. Baker-Snoqualmie National Forest. Pacific Northwest Region. USDA Forest Service, Portland, Oregon.
- USDA Forest Service. 1990b. Final Environmental Impact Statement and Land and Resource Management Plan. Wenatchee National Forest. Pacific Northwest Region. USDA Forest Service, Portland, Oregon.
- USDA Forest Service and USDI Fish and Wildlife Service. 1995. Snoqualmie Pass Adaptive Management Area, current conditions and alternatives. Wenatchee and Snoqualmie/Mount Baker National Forest and Fish and Wildlife Service. Western Washington Office of the President's Forest-management Plan Program. June 1995.
- USDA Forest Service. 1996c. Final Environmental Impact Statement, Huckleberry Land Exchange, Mt. Baker-Snoqualmie National Forest. USDA, Forest Service, Pacific Northwest Region, Washington.
- USDA Forest Service. 1998. Final Environmental Impact Statement, Green River Road Access Requests, Mt. Baker-Snoqualmie National Forest. USDA, Forest Service, Mt. Baker-Snoqualmie National Forest, Mountlake Terrace, Washington.
- USDA Forest Service. 1998. Draft Final Environmental Impact Statement, Plum Creek Checkerboard Access Project, Wenatchee National Forest. USDA, Forest Service, Wenatchee National Forest, Wenatchee, Washington
- USDA Forest Service. 1998. Final Final Environmental Impact Statement, Plum Creek Checkerboard Access Project, Wenatchee National Forest. USDA, Forest Service, Wenatchee National Forest, Wenatchee, Washington
- USDA Forest Service; Wenatchee, Mt. Baker-Snoqualmie, and Gifford Pinchot National Forests (USFS). 1998a. I-90 Land Exchange, USDA Forest Service/Plum Creek Timber Company, L.P., Draft Environmental Impact Statement. Wenatchee National Forest, Wenatchee, WA; Mt Baker-Snoqualmie National Forest, Mountlake Terrace, WA; and Gifford Pinchot National Forest, Vancouver, Washington.
- USDA Forest Service; Wenatchee, Mt. Baker-Snoqualmie, and Gifford Pinchot National Forests (USFS). 1998b. I-90 Land Exchange, USDA Forest Service/Plum Creek Timber Company, L.P. Final Environmental Impact Statement. Wenatchee National Forest, Wenatchee, WA; Mt. Baker-Snoqualmie National Forest, Mount Lake Terrace, WA; and Gifford-Pinchot National Forest, Vancouver, Washington.

- USDA Forest Service and USDI Bureau of Land Management. 1994. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl; Standards and Guidelines for Management of Habitat for Late-successional and Old-growth Forest Related Species Within the Range of the Northern Spotted Owl. USDA, U.S. Forest Service and USDI, Bureau of Land Management, Portland, Oregon.
- USDI Fish and Wildlife Service. 1992. Protocols for Surveying Proposed Management Activities that May Impact Northern Spotted Owls. Unpublished report. March 7, 1991, revised March 17, 1992. 11 pp.
- USDI Fish and Wildlife Service. 1996. Unlisted Species Assessment: Analysis of Effects on Unlisted Species From Implementation of the Plum Creek I-90 HCP. Habitat Conservation Planning Team, U.S. Fish and Wildlife Service, Olympia, Washington.
- USDI Fish and Wildlife Service. 1996. Intra-Service Biological Opinion on the Proposed Issuance of an Incidental Take Permit (PRT-808398) for Northern Spotted Owls, Marbled Murrelets, Grizzly Bears, and Gray Wolves to Plum Creek Timber Company (FWS Reference 1-3-96-FW-190) and the Approval of an Unlisted Species Agreement for all Vertebrate Species. USDI Fish and Wildlife Service, North Pacific Coast Ecoregion, Western Washington Office, Olympia, Washington.
- USDI Fish and Wildlife Service and USDC National Marine Fisheries Service. 1996. Record of Decision: Proposed Issuance of a Permit to Allow Incidental Take of Threatened and Endangered Species to Plum Creek Timber Company, L.P. for Lands in the I-90 Corridor of King and Kittitas Counties, Washington.
- USDI Fish and Wildlife Service and USDC National Marine Fisheries Service. 1996a. Draft Environmental Impact Statement for the Proposed Issuance of a Permit to Allow Incidental Take of Threatened and Endangered Species, Plum Creek Timber Company, L.P.; Lands in the I-90 Corridor, King and Kittitas Counties, Washington. Prepared by Raedeke Associates, Inc., Seattle, Washington.
- USDI Fish and Wildlife Service and USDC National Marine Fisheries Service. 1996b. Final Environmental Impact Statement for the Proposed Issuance of a Permit to Allow Incidental Take of Threatened and Endangered Species, Plum Creek Timber Company, L.P.; Lands in the I-90 Corridor, King and Kittitas Counties, Washington. Prepared by Raedeke Associates, Inc., Seattle, Washington.
- USDI Fish and Wildlife Service and USDC National Marine Fisheries Service. 1996c. Habitat Conservation Planning Handbook. November 1996.
- USDA. 1998. I-90 Land Exchange: Draft Environmental Impact Statement. Wenatchee, Mt. Baker-Snoqualmie, and Gifford Pinchot National Forests. April 1998.
- Washington Department of Fish and Wildlife. 1997. Letter dated January 21, 1997 from Tom Cyra, Wildlife Diversity Division, regarding Review of Spotted Owl Surveys for Historic (Status 5) Classification.
- Washington Department of Natural Resources. 1993. State of Washington Smoke Management Plan. WDNR, Division of Fire Control, Olympia, Washington.

Abbreviations, Definitions, and Literature Citations

Washington Department of Natural Resources. 1995. Washington Forest Practices: Rules - WAC 222, Board Manual, and Forest Practices Act - RCW 76.09. Department of Natural Resources, Olympia, Washington.

Washington Employment Security Department, Labor Market and Economic Analysis Branch. 1995. Employment Payrolls in Washington State by County and Industry. Olympia, Washington.

Williams, G.D. and W.A. Babcock. 1983. The Yakima Indian Nation Forest Heritage: A History of Forest Management on the Yakima Indian Reservation, Washington. Heritage Research Center and Bureau of Indian Affairs. September 1983.

YIN, Washington Department of Fisheries. 1990. Yakima River Subbasin Salmon and Steelhead Production Plan.

FSEIS INDEX

A

Adaptive Management.....	1-4, 1-8, 1-9, 2-1, 4-9, 4-22, 4-26, 4-27, 4-34, 4-58, 4-74, 5-10, 5-14
Adaptive Management Areas.....	1-4, 1-8, 4-26, 4-27
Administratively Withdrawn Areas.....	1-8
Air Quality.....	3-1, 3-4, 4-14, 5-10
AMAs, see Adaptive Management Areas	
Amphibians.....	3-10, 4-20, 4-35, 4-39, 4-40, 5-12, 5-13
Anadromous Fish.....	2-2, 3-12, 4-6, 4-15, 4-58, 4-59, 4-60
Aquatic.....	1-8, 1-10, 2-2, 3-18, 3-27, 4-6, 4-9, 4-11, 4-15, 4-16, 4-35, 4-39, 4-45, 4-46, 4-47, 4-56, 4-57, 4-59, 4-60, 5-10
Aquatic Conservation Strategy.....	2-2, 4-9, 4-60, 5-10
Associated Species.....	3-11, 4-20, 4-34
Assumptions.....	1-5, 1-9, 2-1, 4-20, 4-34

B

Bald Eagle.....	1-9, 3-7, 4-5, 4-33, 4-50, 4-70
Bat.....	3-10, 4-42, 4-55
Bull Trout.....	3-7, 3-12, 4-6, 4-15

C

Canopy Closure.....	4-27
Caves.....	4-21, 4-42, 4-55, 4-57
Clean Air Act.....	3-4
Coarse Woody Debris.....	4-40, 4-42, 4-52
Connective Corridors.....	4-34
Connectivity.....	1-9, 4-9, 4-26, 4-28, 4-58, 4-71
Critical Habitat.....	1-11, 3-8, 3-9, 4-71
Cumulative Effects.....	1-12, 4-9, 4-10, 4-11, 4-46, 4-60, 4-70, 4-71, 4-73

D

DCAs, see Designated Conservation Areas	
Deferrals.....	2-2, 4-4, 4-5, 4-17, 4-19, 4-22, 4-23, 4-27, 4-28, 4-32, 4-33, 4-50, 4-53, 4-68, 4-71
Designated Conservation Areas.....	2-2, 4-24
Dispersal Corridors.....	2-2, 4-23, 4-27, 4-28, 4-52, 4-58
Dispersal Habitat.....	4-21, 4-23, 4-24, 4-26

E

Ecosystem.....	1-8, 4-15, 4-20, 5-12
Employment.....	3-13, 3-14, 4-60, 4-61, 5-16
Endangered Species Act.....	1-3, 1-11, 3-13, 3-37, 5-10, 5-11
Environmental Consequences.....	1-12, 2-1, 2-3, 4-1, 4-16
ESA, see Endangered Species Act	

F

FD, see Foraging and Dispersal Habitat	
FIBRPLAN.....	2-3
Forest Practices Rules and Regulations.....	4-1, 4-9, 4-10, 4-11, 4-12, 4-13, 4-15, 4-16, 4-29, 4-33, 4-40, 4-41, 4-42, 4-45, 4-50, 4-52, 4-53, 4-55, 4-56, 4-57, 4-60, 4-64, 4-69, 4-74
Forest Service.....	1, 2, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, 2-1, 2-2, 2-3, 3-2, 3-3, 3-8, 3-10, 3-12, 3-17, 3-19, 3-20, 3-21, 3-27, 3-29, 3-30, 3-31, 3-32, 3-33, 3-34, 3-35, 3-36, 3-37, 3-39, 4-1, 4-2, 4-7, 4-9, 4-10, 4-12, 4-13, 4-14, 4-16, 4-20,

FSEIS Index

..... 4-26, 4-27, 4-29, 4-30, 4-31, 4-32, 4-33, 4-44, 4-45, 4-46, 4-49, 4-52, 4-55,
..... 4-57, 4-58, 4-60, 4-63, 4-64, 4-66, 4-67, 4-68, 4-69,
..... 4-70, 4-71, 4-72, 4-74, 5-2, 5-6, 5-12, 5-13, 5-14
Fragmentation..... 3-2

G

Goshawk..... 2-2, 4-5, 4-32, 4-33, 4-50
Gray Wolf..... 1-9, 2-2, 3-7, 3-10, 3-13, 4-5, 4-31, 4-43, 4-70, 5-15
Grizzly Bear..... 1-9, 2-2, 3-7, 3-9, 3-13, 4-4, 4-7, 4-29, 4-30, 4-31, 4-43, 4-44, 4-58, 4-67, 4-68, 4-70, 4-73, 5-12, 5-15

I

IA, see Implementation Agreement

Impacts..... 1-3, 1-5, 1-7, 1-12, 3-8, 3-9, 3-35, 3-37, 4-1, 4-4, 4-7, 4-8, 4-11,
..... 4-13, 4-14, 4-15, 4-17, 4-18, 4-19, 4-20, 4-21, 4-24, 4-27, 4-28,
..... 4-29, 4-31, 4-32, 4-33, 4-34, 4-35, 4-39, 4-40, 4-41, 4-42, 4-45,
..... 4-48, 4-52, 4-54, 4-55, 4-57, 4-59, 4-62, 4-64, 4-67, 4-69, 4-70,
..... 4-72, 4-73, 4-74, 5-11, 5-12
Implementation..... 1, 1-4, 1-6, 1-8, 1-9, 3-4, 3-10, 3-12, 3-37, 4-10, 4-20, 4-21, 4-27,
..... 4-28, 4-30, 4-31, 4-32, 4-33, 4-35, 4-39, 4-40, 4-41, 4-43, 4-45, 4-47, 4-49,
..... 4-50, 4-51, 4-53, 4-55, 4-57, 4-69, 4-71, 5-10, 5-15
Implementation Agreement..... 1, 1-4, 3-12, 5-10
Incidental Take Permit..... 1, 1-3, 1-4, 1-8, 1-9, 3-7, 3-12, 4-9, 4-69, 4-71, 5-10, 5-11, 5-15
ITP, see Incidental Take Permit

L

Land Exchange..... 1, 1-4, 1-5, 1-6, 1-8, 1-9, 2-1, 2-2, 2-3, 3-2, 3-8, 3-10, 3-12, 3-14, 3-19,
..... 3-20, 3-27, 3-31, 3-34, 3-35, 4-1, 4-9, 4-25, 4-27, 4-28, 4-32, 4-33, 4-34, 4-35,
..... 4-39, 4-46, 4-50, 4-58, 4-64, 4-65, 4-66, 4-70, 4-71, 4-72, 4-73, 4-74, 5-12, 5-13, 5-14, 5-15
Landscape..... 2-3, 3-6, 3-12, 3-15, 3-17, 3-18, 3-22, 3-23, 3-25, 3-26, 3-29, 3-30,
..... 3-37, 4-15, 4-16, 4-20, 4-21, 4-23, 4-24, 4-26, 4-27, 4-28, 4-34, 4-42, 4-44,
..... 4-46, 4-47, 4-56, 4-57, 4-58, 4-62, 4-63, 4-68, 4-69, 4-71
Large Woody Debris..... 4-35, 4-39, 4-41, 4-59
Late-Successional Reserves..... 1-4, 1-8, 4-52
Lifeforms..... 2-3, 3-11, 4-21, 4-31, 4-33, 4-34, 4-35, 4-36, 4-53, 4-54, 4-57
LSR, see Late-Successional Reserves
LWD, see Large Woody Debris

M

Marbled Murrelet..... 2-2, 3-7, 3-8, 3-9, 3-13, 4-28, 4-29, 4-70, 5-15
Matrix..... 1-4, 1-8, 1-9, 3-8, 3-11, 4-2, 4-9, 4-71, 5-13
Mitigation..... 1-10, 2-2, 2-3, 3-22, 3-35, 3-36, 4-11, 4-12, 4-30, 4-40, 4-41, 4-42, 4-51, 4-53, 4-55, 4-64
Monitoring..... 2-2, 2-3, 3-7, 3-8, 4-15, 4-22, 4-23, 4-27, 4-28, 4-32, 4-34

N

National Environmental Policy Act..... 1-5, 3-34, 5-10
National Marine Fisheries Service..... 1, 1-3, 3-39, 4-70, 5-10, 5-11, 5-13, 5-15
NEPA, see National Environmental Policy Act
NMFS, see National Marine Fisheries Service
Northern Spotted Owl..... 1-8, 3-7, 3-13, 4-9, 4-21, 4-28, 4-40, 4-41, 4-55, 4-70, 4-71, 5-12, 5-13, 5-14, 5-15
Northwest Forest Plan..... 1-4, 1-8, 1-9, 2-1, 3-26, 4-20, 4-21, 4-23, 4-63, 4-65, 4-67, 4-71, 5-10
NRF, see Nesting, Roosting, and Foraging Habitat
NWFP, see Northwest Forest Plan

P

Peregrine Falcon..... 1-9, 3-7, 3-13, 4-42, 4-70
Permit Period..... 2-3, 3-7, 4-23, 4-26, 4-35, 4-39, 4-40, 4-50, 4-52

Planning Area 1-4, 1-5, 1-7, 1-8, 1-9, 1-10, 1-11, 2-1, 2-2, 2-3, 3-1, 3-2, 3-3, 3-4, 3-5, 3-6, 3-7, 3-8,
 3-9, 3-10, 3-11, 3-12, 3-13, 3-14, 3-16, 3-17, 3-18, 3-19, 3-20, 3-21, 3-24, 3-26,
 3-28, 3-29, 3-30, 3-31, 3-32, 3-33, 3-34, 3-37, 4-1, 4-2, 4-4, 4-9, 4-10, 4-11, 4-12,
 4-13, 4-14, 4-15, 4-16, 4-17, 4-19, 4-20, 4-21, 4-22, 4-23, 4-24, 4-25, 4-26, 4-27,
 4-28, 4-29, 4-30, 4-31, 4-32, 4-33, 4-34, 4-35, 4-41, 4-42, 4-43, 4-44, 4-45, 4-46,
 4-47, 4-50, 4-51, 4-52, 4-53, 4-54, 4-55, 4-56, 4-57, 4-58, 4-59, 4-60, 4-61, 4-63,
 4-64, 4-66, 4-67, 4-68, 4-69, 4-71, 4-72, 4-74
 Public Comment 2, 1-6, 1-9, 3-12, 3-35

R

Recovery Plan for the Northern Spotted Owl 4-9, 4-71, 5-12
 Recreation 3-1, 3-2, 3-3, 3-5, 3-37, 4-7, 4-67, 4-68, 5-10
 Reptiles 4-20, 4-41, 4-43, 5-13
 Research 1, 3-18, 3-22, 3-27, 3-34, 3-35, 4-34, 5-13, 5-16
 Resource Selection Probability Function Model 5-10
 Restoration 1-3, 1-10, 4-27, 4-28
 RHAs, see Riparian Habitat Areas
 Riparian Habitat Areas 2-2, 4-11, 4-22, 4-27, 4-28, 4-48, 4-51
 Riparian Leave Tree Areas 2-2, 4-11, 4-15
 Riparian Reserves 1-8, 4-51, 4-54, 4-57, 4-74
 Riparian Zone 4-48
 RLTAs, see Riparian Leave Tree Areas
 Road Access 3-9, 5-14
 Road Building and Maintenance 4-12, 4-13
 Road Closures 4-12, 4-13, 4-30, 4-31, 4-68, 4-73
 Roadless Areas 4-1, 4-9, 4-10
 RSPF, see Resource Selection Probability Model

S

Salmon 1-10, 3-7, 3-12, 5-16
 Scoping 1-6, 1-7, 1-11, 2-1
 Section 10(a) Permit Species 4-20, 4-21
 Sensitive Species 3-10
 Snoqualmie Pass Adaptive Management Area 1-8, 1-9, 4-9, 4-58, 5-10, 5-14
 SPAMA, see Snoqualmie Pass Adaptive Management Area
 Special Emphasis Species 3-7, 3-10, 3-12, 4-20, 4-31, 4-35, 4-39, 4-41, 4-42, 4-43, 4-46, 4-48, 4-50, 4-53, 4-54
 Special Habitats 1-9, 2-2, 3-6, 3-11, 4-20, 4-40, 4-47, 4-51, 4-55, 4-56, 4-57, 4-74
 Species of Concern 3-7, 3-10, 4-20, 4-33, 4-41, 4-42, 4-46, 4-50, 4-51, 4-53, 4-54, 5-13
 Spotted Owl Habitat 4-4, 4-22, 4-23, 4-24, 4-25, 4-26, 4-49, 4-53
 Surveys 1, 2-2, 3-7, 3-8, 3-9, 3-10, 3-19, 3-30, 3-32, 3-34, 3-35, 3-36, 4-22, 4-28, 4-29, 4-61, 4-72, 5-15

T

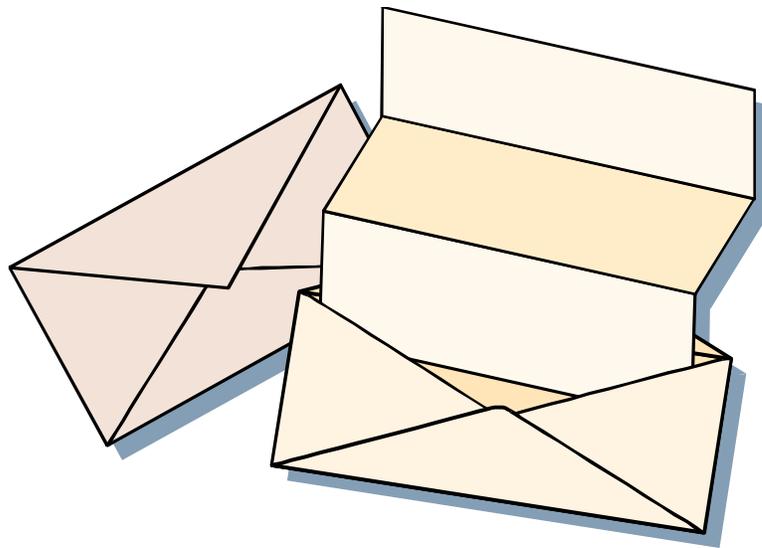
Talus Slopes 2-2, 3-10, 4-5, 4-17, 4-18, 4-31, 4-32, 4-42, 4-45, 4-51, 4-53, 4-55, 4-56, 4-65
 Thinning 4-20, 4-73
 Threatened Species 1-3
 Timber, Fish, and Wildlife 4-65

W

Water Quality 3-1, 3-4, 4-3, 4-6, 4-11, 4-15, 4-16, 4-41, 4-59, 4-60, 4-62, 4-74
 Watershed Analysis 2-2, 3-3, 4-3, 4-11, 4-12, 4-13, 4-15, 4-16, 4-35, 4-39, 4-40, 4-41, 4-59, 4-69, 5-11
 Wetlands 4-4, 4-6, 4-21, 4-30, 4-35, 4-39, 4-40, 4-41, 4-44, 4-45, 4-46, 4-47, 4-48, 4-50, 4-51, 4-53, 4-54, 4-55, 4-57, 4-73

APPENDIX A

FINAL
COMMENTS ON THE DSEIS
FOR APPROVAL OF
MODIFICATIONS TO PLUM CREEK TIMBER COMPANY'S
CENTRAL CASCADES HABITAT CONSERVATION PLAN



April, 1999

CONTENTS

CONTENTS	1
LETTERS	3
A. U.S. ENVIRONMENTAL PROTECTION AGENCY.....	3
B. U.S. FOREST SERVICE — WENATCHEE NATIONAL FOREST.....	4
<i>B.I General Comments.....</i>	4
<i>B.II Specific Comments.....</i>	4
Chapter One	4
Chapter Two	5
Chapter Three.....	6
Chapter Four.....	6
Draft Modifications to Cascades Habitat Conservation Plan.....	10
C. MUCKLESHOOT INDIAN TRIBE.....	11
<i>C.I Comments on the Draft Supplemental Environmental Impact Statement portions relative to fish and wildlife.....</i>	11
<i>C.II Comments on Draft Description and Analysis of Modifications to Plum Creek Timber Company’s Cascade Habitat Conservation Plan.....</i>	47
<i>C.III Comments on the Draft Supplemental Environmental Impact Statement portions relative to Cultural Resources.....</i>	66
D. WASHINGTON DEPARTMENT OF FISH AND WILDLIFE	69
E. ALPINE LAKES PROTECTION SOCIETY	77
F. SIERRA CLUB — CASCADE CHAPTER	83
G. MOUNTAINEERS.....	95
H. WASHINGTON FOREST LAW CENTER	98
I. AMERICAN LANDS ALLIANCE.....	100
<i>I.I Summary.....</i>	100
<i>I.II Detailed Comments.....</i>	107
J. DONALD AND LINDA PARKS.....	122
K. CHARLES A. PHILIPS.....	125
Chapter 4 Environmental Consequences	128
L. ROBERT WATTEZ.....	139
PUBLIC MEETINGS.....	141
M. ISSAQUAH MEETING.....	141
N. ELLENSBURG MEETING.....	142
O. MEETINGS WITH TRIBES	142
<i>O.I Meeting of December 16, 1998:.....</i>	142
<i>O.II Meeting of January 13, 1999:</i>	144
<i>O.III Meeting of May 7, 1999:.....</i>	147

LETTERS

A. U.S. ENVIRONMENTAL PROTECTION AGENCY

1. **Comment:** The Environmental Protection Agency indicates that it has no objections to the subject document.

Services' Response: The Services appreciate the diligence of EPA staff in reading not only the DSEIS but other documents incorporated by reference.

B. U.S. FOREST SERVICE — WENATCHEE NATIONAL FOREST

B.I GENERAL COMMENTS

- 1. Comment on Legislative Package:** Because the HCP modification is in response to changes precipitated by the I-90 Land Exchange, it is very important that the numbers and figures used in your DSEIS reflect those described in the Legislative package for the exchange. The DSEIS presently has several discrepancies in these figures and ownership maps. We are thus enclosing a complete package of the legislation, plus maps, for your use in revising the DSEIS.

Services' Response: Thank you for the information regarding the legislated land exchange. The DSEIS evaluated the preliminary HCP modifications submitted by Plum Creek. At the time the HCP modification document was prepared the legislative package was neither completed nor enacted. For this reason, Plum Creek was forced to make a "best estimate" of the Planning Area ownership following legislative approval of the land exchange. The "best estimate"—was conservative and assumed fewer parcels transferred to the Forest Service. Ownership in the Planning Area was updated in a subsequent draft of the HCP modification document, which accompanies this FSEIS. The final land exchange package will be negotiated over the next few weeks. The FEIS for the land exchange will address the legislated package which will be different than the final land exchange package after taking into consideration appraisal values and cultural resource issues. The two documents—will address different ownership in the Planning Area. Ideally, the NEPA process for the land exchange (i.e., FEIS) would be completed prior to completion of the NEPA process for the HCP modification (i.e., FSEIS). However, to comply with the legislated deadline of 270 days to complete the land exchange, the NEPA process for the land exchange and the HCP modification had to be prepared concurrently. Any differences between ownership assumptions in this document and the final land exchange are expected to be small as the proposed ownership patterns in the FSEIS reflect the latest information and appraisal results. The Record of Decision for the HCP modification will reflect the final land exchange package. The ROD for the modifications will reflect actual lands.

- 2. Comment on NWFP:** We note also a reliance on the Northwest Forest Plan as the source of management direction for the National Forest lands. However, the Northwest Forest Plan is actually an amendment to the Wenatchee National Forest Land and Resource Management Plan. Throughout the DSEIS, please replace the use of "NWFP" with "the amended Forest Plans," unless the reference is specific to the Northwest Forest Plan, which would only be occasional.

Services' Response: "NWFP" has been replaced with "amended Forest Plan" where appropriate throughout the document, and where the NWFP is more appropriate it has been left unchanged.

B.II SPECIFIC COMMENTS

CHAPTER ONE

- 3. Comment on Legislative Package:** Page 1-2: As stated above, please be sure the figures used conform to the Legislative package.

Services' Response: See response to Forest Service Comment 1 (B.I, 1).

- 4. Comment on SPAMA:** Page 1-5: (1.4.2) At the end of the 1st paragraph state: {A part of the National Forest System lands within the HCP Planning area are also managed under the Snoqualmie Pass

AMA, prepared under the direction of the Northwest Forest Plan,} to provide context for the following AMA discussions.

Services' Response: The statement has been added.

5. **Comment on NWFP designations:** Page 1-5: (1.4.2) Add Managed Late Successional Areas to the list of Northwest Forest Plan allocations, and drop Key Watersheds, which is not an allocation.

Services' Response: “Managed Late Successional Areas” has been added and “Key Watersheds” has been deleted.

6. **Comment on SPAMA Management:** Page 1-6: Revise last sentence of 1st paragraph to state: *Under SPAMA, newly acquired federal lands would be managed to provide habitat for organisms associated with late successional forests, and to contribute to critical wildlife connectivity objectives within the AMA.*

Services' Response: The last sentence on Page 1-6 has been revised as requested.

7. **Comment on MAP:** Figure 1: Make sure this map matches the legislated package (see enclosure).

Services' Response: Figure 1 reflects the ownership in the HCP modification which represents a “best estimate” of the final land exchange package as described in the response to Forest Service Comment 1.

CHAPTER TWO

8. **Comment on Amended Forest Plans:** Page 2-2: 1st paragraph, Instead of “of the NWFP” it would be better to state: *key areas identified by the amended Forest Plan*, to make it clear the HCP isn't providing supplemental habitat to be included under the Forest Plan (which applies only to federal lands). The Forest Plan can identify key areas regardless of ownership, however the “of the NWFP” implies lands actually subject to the management direction of the NWFP.

Services' Response: As requested, “of the NWFP” has been changed to “key areas identified by the Northwest Forest Plan.”

9. **Comment on “Within:”** Page 2-2: 2nd paragraph, Instead of “within” use “adjacent to.” Again, we do not want to give the impression that National Forest direction applies to private lands.

Services' Response: Where appropriate, the word “within” has been changed to “interspersed.” The Services' believe that “interspersed” better describes the relationship among landowners in the HCP Planning Area. In the case of Plum Creek's HCP, the NWFP designations in which their lands are interspersed are important for several reasons. First, actions it has committed to conducting vary by NWFP designation. For instance, in the Green River Basin, perennial nonfish-bearing streams receive 100-foot buffers if they are in AMA or LSR below 5,000 feet in elevation. Also, designations are important for analysis purposes. Because the intent is to compliment the NWFP and amended Forest Plans, it is important to analyze landscape level effects by NWFP designation. Such landscape levels amount of habitat need to be addressed across all ownerships. For these reasons, the Services view the designations as having applicability to the interspersed nonfederal lands as well, even if those lands are not subject to exactly the same standards that apply to Federal lands.

CHAPTER THREE

- 10. Comment on Eastern Washington Lands:** Page 3-14: (1st paragraph) There is no mention of any Plum Creek ownership in eastern Washington.

Services' Response: When the HCP was implemented in June 1996, Plum Creek owned lands in the eastern half of Washington, near Newport and Colville. Subsequently, these lands were sold. Currently, Permittee-owned lands in Washington includes lands east of the Cascade Crest interspersed within the Wenatchee National Forest and west of Cascade Crest interspersed within the Mt. Baker-Snoqualmie and Gifford Pinchot National Forests.

- 11. Comment on Prehistoric Cultures:** Page 3-14: (3.10.1) Instead of “this population” which appears to refer to cultures over 10,000 years old, substitute *prehistoric cultures*, since the majority of sites described are far younger than 10,000 years old.

Services' Response: “This population” has been replaced with “prehistoric cultures.”

- 12. Comment on Territorial Governor:** Page 3-14: (3.10. 1) Cross out ...”When the territorial governor began efforts to work with Native Americans.” He actually initiated treaty proceedings and relocation efforts; an event that today’s Indian population would view as more antagonistic than cooperative.

Services' Response: The requested change has been made. See also the response to comment 92 submitted by the Muckleshoot Indian Tribe (C.III, 92).

- 13. Comment on 1855 Yakama Indian Treaty:** Page 3-15: (3.10.3, 1st paragraph) Between the second and third sentences, add:

Furthermore, National Forest lands east of the Cascade Crest within the Planning area are within the lands ceded by the American Indians to the U.S. Government under the 1855 Yakama Indian Treaty.

Services' Response: The requested change has been made.

- 14. Comment on Cultural Resource Model:** On Page 3-15: (3.10.4) At the end of the 1st sentence, the Forest Service suggests adding the following text: *on lands under Plum Creek ownership.*

Services' Response: The use of such models is not related to ownership of the land. The model developed cooperatively by the Plum Creek, the Yakama Indian Nation, environmental groups, and State and Federal agencies would work equally as well on other ownerships interspersed in the area for which it was developed.

- 15. Comment on Recreation Statistics:** Page 3-16: We suggest updating the recreation figures, since those cited are 11 years old. The Wenatchee reported 5.4 million recreation visits in 1998.

Services' Response: Thank you for this information. In addition to the above visits to the Wenatchee National Forest, the Mt. Baker -Snoqualmie National Forest reports 6.4 million recreation visits in the same time period (Penny Custer telephone conversation, March, 1999).

CHAPTER FOUR

- 16. Comment on Terminology/Semantics:** Throughout the entire effects section, we suggest using the words *reduce*, or *reduced*, or *small*, in place of “minimize” and “minimal” when speaking of effects.

Services' Response: The Services note that the word “minimize” has specific connotations with respect to section 10 of the ESA. An HCP is expected to contain measures that minimize and mitigate

the impacts of the taking to the maximum extent practicable. We also note that there is a subtle yet distinct difference between the word “small” and “minimal.” For instance, it would not be appropriate to categorize the impacts of the alternative on murrelets as small. Instead, we use the word “minimal” to indicate the effects are near zero (i.e., negligible). The Services will review the terminology it used throughout the DSEIS and make adjustments where they are appropriate.

- 17. Comment on “Within:”** Page 4-2: (Table 2) Land use within the Planning Area needs revision. The “Northwest Forest Plan” allocations apply only to National Forest lands; Plum Creek lands may be adjacent to these allocations, but are not within them.

Services’ Response: Table 2 has been changed to clarify this point. Under Land Use within the Planning Area — Plum Creek, “Acres within” has been changed to “Acres interspersed with.”

- 18. Comment on Direction for Management of Private Lands:** On Page 4-7: (2nd paragraph) The Forest Service states that the final draft recovery plan for spotted owls is not connected with the Northwest Forest Plan; and suggests crossing out the first sentence.

Services’ Response: The Services believe the first sentence is very accurate “The NWFP does not provide management direction or guidelines for, or regulation of private lands.” We believe this is an important statement to include so that the reader will understand why discussions were included regarding the final draft recovery plan and the Washington State Forest Practices Regulations regarding spotted owls.

- 19. Comment on SPAMA Management (Land Use):** Page 4-7: (2nd paragraph) Revise second to the last sentence to state: *Under SPAMA, newly acquired federal lands would be managed to provide habitat for organisms associated with late-successional forests, and to contribute to critical wildlife connectivity objectives within the AMA.*

Services’ Response: The requested change has been made.

- 20. Comment on Consistent Objectives (Land Use):** Page 4-7: (3rd paragraph) Drop “is consistent with the objectives of SPAMA since those objectives are quite different than the HCP’s, as are the allowed management practices.

Services’ Response: The requested change has been made. However, the Services believe the goals of the HCP and those of the NWFP and SPAMA, with respect to long-term survival of fish and wildlife species are the same.

- 21. Comment on SPAMA Management (Land Use):** Page 4-8: (1st paragraph) Revise last sentence to state: *Under SPAMA, newly acquired federal lands would be managed to provide habitat for organisms associated with late successional forests, and to contribute to critical wildlife connectivity objectives within the AMA.*

Services’ Response: The requested change has been made.

- 22. Comment on Consistent Objectives (Land Use):** Page 4-8: (4.2.3) Drop “is consistent with the objectives of “SPAMA” since those objectives are quite different than the HCP’s, as are the allowed management practices.

Services’ Response: The requested change has been made. However, the Services believe the goals of the HCP and those of the NWFP and SPAMA, with respect to fish and wildlife species, are the same.

- 23. Comment on Potential Benefits (Land Form and Geology):** Page 4-11: (4.3.3 1st paragraph, second sentence) The consequences would not be the same as Alternative 1, since thousands of acres of Plum Creek lands will be transferred to the more restrictive management of the National Forests.

Services' Response: The following has been added to clarify this point. "...for land managed by Plum Creek as under the No Action Alternative. Overall, there would be less effect because thousands of acres of Plum Creek's lands would be transferred to the Forest Service and managed under the more conservative Rules and Regulations of the National Forests. However, in some areas such as the Green River where the net change in land is a slight loss of Federal ownership, these benefits would not occur."

- 24. Comment on Potential Benefits (Water Quality & Quantity):** Page 4-14: (4.5.3) At the end of the last sentence, add: *or less, since a greater proportion of the land within the Planning area would become subject to the protection afforded on National Forest System lands by the Aquatic Conservation Strategy.*

Services' Response: The requested change has been made. However, benefits would not accrue in all areas. There will be fewer acres of Federal land in the Green River Basin following the land exchange, leading to the potential for impacts.

- 25. Comment on National Forest Lands (Vegetation):** Page 4-15: (4.6.1) Separate out Plum Creek and other ownerships from National Forests so the vegetative effects can specifically be displayed for the HCP under each alternative.

Services' Response: Throughout the HCP modification document (and other documents related to the HCP), the total Planning Area including all ownerships is analyzed for impact across the entire area. Impacts are appropriate to display across all ownerships on a landscape level. Plum Creek ownership is also displayed since it is mitigation on Plum Creek lands for which the incidental take permit was issued. Displaying vegetation characteristics on Forest Service lands only is not relevant to this action. However, those interested in such information should be able to find it in the Forest Service FEIS for the land exchange.

- 26. Comment on Plum Creek Ownership (Vegetation):** Page 4-16: (Table 3) In order to more accurately reflect the effects of HCP implementation, Plum Creek ownership should be broken out.

Services' Response: The Services note that Table 3 is a simplified version of Table 30A in the HCP Modification document. Table 30A does break out Plum Creek ownership for the proposed action. Table C in the same document also presents comparable information.

- 27. Comment on Indirect Effects:** Page 4-17: (4.7) Item (3) An indirect effect to wildlife is the loss or reduction in forage, species, or numbers through habitat manipulation or alteration.

Services' Response: The Services concur. Item (3) addresses loss of suitable habitat. An organism's habitat includes forage and prey items as well as the structural components of surrounding vegetation and other abiotic factors. Habitat manipulation or alteration, which reduces forage or prey density to the point it no longer supports a given species is considered "reducing suitable habitat."

- 28. Comment on Ownership (Spotted Owls):** Page 4-21: (Alternative 1) Again, the description and Table 4 should separate out Plum Creek ownership so as to better reflect the HCP effects on amount and type of habitat.

Services' Response: Please see Table 5 which presents the requested information.

- 29. Comment on Grizzly Bears:** Page 4-28: (Alternative 1, 3rd paragraph) Under the No Action Alternative, the HCP is the existing condition; we suggest dropping “over existing conditions.”

Services' Response: The Service's intent was to indicate that following the actions outlined in the HCP, there would be an improvement in conditions. The use of the phrase “over existing conditions,” was to differentiate the trend of improvement expected under the no-action of continuing the HCP without the land exchange, from the conditions at one single point in time. The No Action Alternative is not the same as existing conditions. The No Action, and all other alternatives, start with existing condition. Differences between alternatives occur with growth, succession, and management and develop their own individual trends for each alternative.

- 30. Comment on Grizzly Bears:** Page 4-29: (2nd paragraph) The last sentence is misleading. Since the allocations and associated standards and guidelines are known for the National Forest lands, Forest Service management is as certain, if not more so, than the actions prescribed by the HCP.

Services' Response: The Service believes that the HCP standards would be more certain over time than the NWFP standards. The HCP standards are bound on both sides: Plum Creek's commitments would prevent it from doing less, and “No Surprises” assurances limit how much and when additional mitigation could be required. The Forest Service has responsibilities under section 7(a)(1) of the ESA that could be invoked more readily and would or could substantially increase the conservation measures for grizzly bears within the Recovery Zone. Therefore, we believe the sentence “While Forest Service management is less certain than the actions prescribed by the HCP, there is continued ability to adjust to the needs of the species in the future” remains valid. Additional text has been added to describe management of Federal lands with respect to grizzly bears.

- 31. Comment on RCAs:** Page 4-49: (Alternative 1) We do not refer to “RCAs” on federal lands, rather, these are called Riparian Reserves. Please check for this elsewhere in your wildlife discussion, as well as pages 4-53, 4-56, and page 25 of Draft Modification to Cascades Habitat Conservation Plan.

Services' Response: The requested change has been made.

- 32. Comment on “Within:”** Page 4-58: (2nd paragraph) Regarding the statement ...” 100 foot RHAs on some nonfish-bearing in federally designated LSRs Plum Creek will not be establishing RHAs in federally designated LSRs; do you mean on Plum Creek land adjacent to National Forest lands allocated as LSRs?

Services' Response: Yes, the sentence refers only to Plum Creek's lands interspersed within or adjacent to Federal lands allocated as LSR. The statement has been clarified.

- 33. Comment on Harvest Volumes:** Page 4-60: (4.9.2, 1st paragraph, last sentence) Wouldn't reductions in timber volume from Plum Creek land be an effect, rather than an offset of expected reductions in volume from federal lands?

Services' Response: The Service agrees that the sentence is confusing. The land exchange contributes to the effects. The NWFP and SPAMA have reduced expected timber harvests. Because Plum Creek's

harvest is proportionally much smaller it cannot offset the effects, especially in light of the proposed land exchange. Therefore, the sentence has been deleted.

- 34. Comment on Recreational Restrictions:** Page 4-62: (4.12.2) Replace last sentence of this section with:
In some areas of the National Forest, there could be restrictions in the level and type of recreation use permitted based upon the particular land allocations in effect.

Services' Response: The requested change has been made to all alternatives.

- 35. Comment on SPAMA Management:** Page 4-64: (1st paragraph) Again, please use the following wording regarding the AMA: *Under SPAMA, newly acquired federal lands would be managed to provide habitat for organisms associated with late-successional forests, and to contribute to critical wildlife connectivity objectives within the AMA.*

Services' Response: The requested change has been made.

DRAFT MODIFICATIONS TO CASCADES HABITAT CONSERVATION PLAN

- 36. Comment on NWFP Designations:** Page 12: (2.2.2, second paragraph) Add Managed Late-Successional Areas to your list of six designated categories under the Northwest Forest Plan.

Services' Response: The requested change has been made.

- 37. Comment on Management of NWFP Designations:** Page 12: (2.2.2, second paragraph) Drop the reference to NWFP land allocations ...”are generally more specific than those under each National Forest Plan,” this is not accurate. The sentence should read: *The land allocations created by the NWFP deal primarily with the management of late-successional and old growth terrestrial and aquatic habitats.*

Services' Response: The requested change has been made in the HCP modification document.

- 38. Comment on Harvest Assumptions:** Page 13: (2.2.3, last paragraph) Although it is true that harvest in Matrix would emphasize ecosystem restoration and enhancement, it is not accurate to state that “...the likelihood of harvest in Matrix areas is minimal... on the Wenatchee National Forest.” We would suggest dropping that statement.

Services' Response: The last paragraph has been modified and now reads, “Discussions with staff from both National Forests indicate that harvest in Matrix areas is likely to be low, but any harvest that does occur would emphasize habitat enhancement. Models for projections over time could not replicate habitat enhancement. Therefore, the growth and yield model runs conducted by Plum Creek for Forest Service lands assumed no harvest in LSR, AMA, and Matrix areas during the HCP Permit period. This approach understated the habitat, which would result from habitat-enhancement activities.”

C. MUCKLESHOOT INDIAN TRIBE

C.I COMMENTS ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT PORTIONS RELATIVE TO FISH AND WILDLIFE

1. **Comment on Puget Sound ESU:** The environmental review failed to consider that the Planning Area contains at least two distinct chinook salmon Evolutionary Significant Units (ESUs). By concentrating upon impacts and the asserted benefits to the Planning Area as a whole, rather than by salmon ESU, the DSEIS has overlooked impacts to Puget Sound chinook salmon.

Services' Response: The HCP modification and land exchange will not affect the Puget Sound ESU for chinook salmon because the proposed action addresses lands above Howard Hanson dam, which NMFS has identified as a complete barrier to the use of the upper Green River watershed by chinook salmon. 63 Fed. Reg. 11481, 11517 (March 9, 1998). NMFS, in their Unlisted Species Assessment addressed both ESUs for Chinook salmon separately, Yakima River Chinook on page 6, and Green River on page 8, citing Washington Department of Fish and Wildlife and Western Washington Treaty Indian Tribes 1994 regarding Puget Sound stocks.

- 1a. **Comment on Green River Chinook Salmon:** The proposed modification to the HCP will decrease the quality and quantity of habitat available for Green River chinook salmon, adversely affecting the potential for stemming the decline of the chinook salmon Puget Sound ESU. Indeed, a major flaw of the proposed amendments to the HCP is a failure to acknowledge: (1) that juvenile chinook salmon are found in the Green River portions of the Planning Area; and (2) That plans are underway by the U.S. Army Corps of Engineers and the City of Tacoma Public Utilities to provide for adult chinook passage into the Green River portions of the planning area. The DSEIS needs to be revised to consider the impacts of extending the HCP to lands currently subject to the more-protective regime of the Aquatic Conservation Strategy.

Services' Response: The Services acknowledge that naturally spawning chinook may one day return to the HCP Planning Area. The Services applaud all those entities responsible for such action including the Muckleshoot Indian Tribe. The Services view this as a positive occurrence. We believe Plum Creek also views this as a positive occurrence especially in light of the "No Surprises" policy, which essentially provides them with "safe harbor" from additional constraints to their management. They have already agreed to conduct actions, which the Services believe will provide for the recovery of chinook in the Green River. While some level of additional impact may result from the proposed land exchange, the Services believe that it is unlikely to be substantial given the small net change of ownership in the watershed. The Services share the Muckleshoot Indian Tribe's concerns for cumulative effects from numerous land exchanges, but believes future exchanges have become less likely as exchangeable lands are transferred by the Forest Service. The Services are particularly concerned when the Forest Service trades out of low-elevation late-seral forest, and especially if that is on the west side of the Cascades.

There are a number of considerations that lead the Services to believe the effects from this proposed action are truly minimal. (1) The net increase of Plum Creek ownership in acres and stream miles is very small on a Basin-wide level; and (2) Compared with the original HCP and its estimation of impacts, a number of additional protections to streams have occurred. These additional protections include increasing the number of fish-bearing streams with 200 foot RHAs, and increasing the number of nonfish-bearing streams viewed as perennial, which has resulted in more 100-foot buffers. Additional buffering on both perennial and seasonal classes of streams will occur through upland

leave tree requirements for wildlife. Thus, fewer seasonal streams are being left without buffers due to logistics of upland leave tree placement. In addition to riparian protection provided by the HCP, perennial, nonfish-bearing streams and seasonal streams are receiving protection via watershed analysis. For example, in the Lester and Upper Green River/Sunday Creek watersheds, an estimated 56 percent of the perennial, nonfish-bearing streams (i.e., DNR Type 4) receive a 50-foot, no-harvest buffer because of slope-stability concerns. A substantial portion of seasonal streams are receiving protection from mass-wasting, erosion, peak flow, and other concerns through watershed analysis. To the extent possible, Plum, Creek will use the information from completed watershed analyses in the Green River Basin to manage Corporate lands in the North Fork Green River WAU. Watershed analysis prescriptions will be applied wherever sensitive situations are readily recognizable. These include landslide-prone areas, like inner gorges, road erosion "hot spots", channel migration zones, etc. Other situations may not be readily recognizable and will be addressed after more complete and detailed mapping is completed through the watershed analysis process.

All of these considerations ameliorated the Services initial fears regarding the effects this land exchange might have had on smaller stream protection on the west side of the Cascade Crest.

We also note that in their 1996 assessment, NMFS acknowledged that passage/introductions of salmonids above Howard Hanson Dam was likely in the future. Planting of Chinook are further discussed in Section 1.4.4 and in the Summary of Meetings in Section O.III of this Appendix. The assessment also acknowledged that coho and steelhead had been planted historically in the Green River basin, and NMFS provided a discussion of the impacts of the HCP on those plantings. Coho and Steelhead in the Green River were acknowledged in the HCP and shown on Figures 24 and 25.

- 2. Comment on Watershed Analysis:** The Tribe does not support extending the commitment to perform watershed analysis in the planning area from 5 to 10 years. The Plum Creek HCP was a major catalyst to undertake watershed analysis in many areas. The prescriptions prepared as a result of watershed analysis initiated by Plum Creek are binding upon all landowners in a Watershed Administrative Unit. Reducing the incentive to undertake watershed analysis will increase the length of time lands are subject to standard forest practices rules, which typically for some aspects of forest management are less protective than watershed analysis prescriptions. The DSEIS failed to consider the impact of extending the period for performing watershed analysis upon natural resources arising from a delay in implementing prescriptions. Though the delay might be a few years, the actions undertaken during the delay, such as timber harvest, will be felt for over a century in the form of reduced habitat and habitat-forming processes.

Services' Response: The extension of the watershed-analysis schedule was completed prior to this proposed action. The schedule extension was made primarily in response to tribal comments requesting such a delay. The intent of the extension was to provide flexibility in the schedule to allow up to 10 years, not to take 10 years. The Services and Plum Creek will schedule the initiation of the last remaining Green River WAU to coincide with the desires of the Muckleshoot Indian Tribe. Currently, the Services understand, from comments made later in this document on the HCP Modification Document that this would be about 2004. We invite the Muckleshoot Indian Tribe to let the Services know if they would like to accelerate, delay, or retain that schedule. Regarding the Plum Creek lands in that WAU (North Fork Green), to the extent sensitive situations exist similar to those in areas with completed watershed analysis and it is reasonable to do so, extrapolation to adjacent WAUs prescriptions will be used to ensure that impacts occurring during the interim are commensurate with those which might have occurred had watershed analysis already been performed.

- 2a. Comment on Cultural Resources:** The DSEIS fails to identify and incorporate recent important ethnographic and archeological data concerning cultural resources and places of importance to the Tribe within the Planning Area. Plum Creek should affirm in the HCP its commitment in cooperation with the Tribe, to develop an archeological predictive model for sensitive and high probability areas for the western slope of the Cascades and provide a schedule for its implementation. Analysis of the presence of culturally sensitive plant species is one essential component of such a model. The Services rely heavily on proposed riparian buffers to protect culturally sensitive areas or resources. This assumption does not adequately address what must be site-specific mitigation requirements.

Services' Response: The FSEIS for HCP modifications incorporates by reference the DEIS and FEIS for the I-90 Land Exchange and the FEIS for the Huckleberry Land Exchange. The Services believe that the Forest Service, in its analysis of the physical impacts of each land exchange, used the most-recent information on cultural resources available to them. As part of the I-90 Land Exchange, the Forest Service is making cultural-resource determinations as to what resources are eligible for listing on the historic registers, whether effects on these resources are significant, and what mitigation will be required. Using these existing environmental documents and the analysis that supports these EISs, the Services have considered the direct, indirect, and cumulative effects of the land exchanges and subsequent HCP modifications upon historic properties of significance under the National Historic Preservation Act. The Services are also incorporating information received from the Muckleshoot Indian Tribe regarding historic places and cultural resources of interest to the Tribe. The information provided by the Tribe is most helpful in this regard. The Services have attempted to reconcile this information into an accurate description of the affected resource and assessment of the impacts likely to occur under each of the alternatives. The Services have also clarified the Trust relationship of the United States and how the Services should implement their portion of that responsibility. The Services will consider any additional information on cultural resources provided by the Muckleshoot Indian Tribe, Yakima Indian Nation, or any other Tribe prior to a decision on the proposed HCP modification.

The Services continue to encourage Plum Creek and the Muckleshoot Indian Tribe to address cultural resources, such as trails and related concerns of Tribal access; but, such actions as predictive models and landowner accommodation are outside the scope of this action. The HCP and ITP authorize incidental take of listed species, but do not authorize the land exchange and do not represent permitting of timber harvests and other land uses. Therefore, we encourage the resolution of these issues outside the ESA arena.

- 3. Comment on Submission of Comments and Meeting:** The Muckleshoot Indian Tribe indicates they will continue to submit comments and requests a meeting with both Services.

Services' Response: The Services welcome the comments of the Muckleshoot Indian Tribe. The requested meeting was held on May 7, 1999, and is discussed in Section O.III of this Appendix. We believe that more-frequent meetings are needed over the next few years to form a better understanding as implementation of the HCP continues during the early formative years. The Services also acknowledge receipt of the Muckleshoot Indian Tribe's Tradition Cultural Property Study completed after submission of comments on the DSEIS.

4. **Comment on Quantification of Take:** The Tribe requested that the Services explain how they quantified the take in the original HCP and how extending the HCP to lands where the riparian management areas will be reduced in size will not increase the authorized take compared to the original HCP. They state this is a major issue as wording of the DSEIS implies that the take authorized by the Services is not an absolute take, but is a relative “take.” The FSEIS should clearly state if the take authorized by the HCP is a relative take or an absolute take.

Services’ Response: The Permit authorizes Plum Creek to “take” certain species (e.g., spotted owls, marbled murrelets, grizzly bears, gray wolves, and Columbia River bull trout) and to take all such species in the course of otherwise lawful forest-management and incidental land-use activities, as described in the permittee’s application and supporting documents, and as conditioned in the permit. The permit does not limit the amount of take. Likewise, the HCP assess impacts in a more general format by addressing impacts to the habitats.

It is the Biological Opinion that quantifies the Services’ estimates of take and addresses the impacts of that level of take on the listed species, distinct populations segment, or evolutionary significant unit. For some species, the take is unquantifiable in terms of numbers of individuals in the Biological Opinion as well. In those instances, as was done for bull trout, the Services estimate take using surrogates such as amount of habitat modified or miles of roads constructed. Riparian areas managed under the HCP have a high likelihood of meeting the functional needs of those areas. If the amount of take anticipated in a Biological Opinion is exceeded, the Services must reinitiate consultation under section 7 of the ESA.

With respect to whether take of permit species is increasing or decreasing as a result of the exchange and subsequent modification, the Services will reserve final judgment until completion of its biological opinion. However, even though the chances of take were very small for grizzlies and wolves, the exchange will result in the vast majority of the HCP Planning Area within the Grizzly Bear Recovery Zone becoming Federal lands. The Grizzly Bear Recovery Zone is also the location of the known bull trout streams in the HCP Planning Area. For spotted owls, Plum Creek will own land, and will thus have the ability to affect owls, in far fewer owl circles than with the original land-ownership pattern. It would be expected that the amount of take would decrease. With respect to murrelets, the Services view the HCP strategy as very close to a take-avoidance strategy. The use of surveys in conjunction with the lack of documentation of murrelets in the upper Green River watershed means that the take of murrelets probably continues to be zero.

5. **Comment on Identified Measures:** The Muckleshoot Indian Tribe stated that all proposed protective, conservation, recovery, and mitigation measures identified in the DSEIS and the FSEIS should be expressly identified in, and placed into the modified HCP and the Incidental Take Permit to ensure all identified measures are enforceable. The FSEIS should identify those measures discussed in the DSEIS and the FSEIS that are not included in the HCP and the ITP.

Services’ Response: The Services agree with the philosophy of the comment. All changes to the HCP are contained within the HCP modification document, which will become part of the revised HCP. No additional commitments or actions are made in the DSEIS or FSEIS which do not already exist in the HCP or HCP modification document.

6. **Comment on Incorporated Comments:** By reference, the Muckleshoot Indian Tribe incorporated their comments to the U.S. Department of Agriculture Forest Service Watershed analysis, the Muckleshoot

Indian Tribe's comments on the Huckleberry and I-90 Land Exchanges, and the USDA Forest Service Green River Watershed Analysis.

Services' Response: The Services note those statements. However, most of those comments were not sent to the Services and even if they had been, they are not specifically made with respect to the proposed action. This FSEIS also incorporates by reference the DEIS and expected FEIS for the I-90 Land Exchange including the responses by the Forest Service to the Muckleshoot Indian Tribe comments.

- 7. Comment on Acronyms:** The SDEIS used the word or abbreviations Riparian Management Areas (RMAs) and Riparian Habitat Areas (RHAs). If these terms have the same connotation in the HCP and the proposed amendments, the use of one term would ease reviewing. If the terms differ in meaning and implementation then this should be made clear in the SFEIS and the proposed HCP amendment.

Services' Response: The Services use the terms of the HCP when referring to HCP-required buffers. These include 200-foot Riparian Habitat Areas and 100-foot Riparian Habitat Areas (RHAs), and 25-foot Riparian Leave Tree Areas (RLTAs). Protection required by the HCP also includes inner gorges and prescriptions that may result from watershed analysis. Additionally, leave trees from the uplands are often clustered along small seasonal streams. These various arrangements are collectively referred to as buffers. The Services agree that wherever terms such as Riparian Management Zone (RMZ) or Riparian Management Areas (RMAs) are used they should be defined. For instance, on page 4-11 of the DSEIS, the Services state that .."Under Alternative 2, Riparian Management Zones (RMZs) would be established and maintained along all fish-bearing streams on newly acquired lands as required under State Forest Practice Rules and Regulations."

Text: Tables 1, 3, 4, 5, 6, and 7.

- 8. Comment on Green River Statistics:** Data presented in tables 1, 3, 4, 5, 6, and 7, are not pertinent to analysis of impacts to habitat in the Green River basin. Without breaking these tables out into lands in the Green River, which encompass the bulk of the lands in the Planning Area west of the Cascade Mountain crest, and the lands east of the Cascades, it is impossible to determine the relative influence of the proposed HCP amendments upon the chinook salmon Puget Sound ESU. Impacts to the Puget Sound chinook ESU can not be mitigated by increased habitat protections or benefits to Columbia River based ESUs.

Services' Response: The Services generally concur. A number of tables specific to the Green River basin are provided in the response to Muckleshoot Indian Tribe Comment 81.

Text: DSEIS page 1-1: "The Cedar River Municipal Watershed (City of Seattle) is located ... The Green River watershed covers a large portion of the Planning Area. Both municipal watersheds are closed to the public."

- 9. Comment on Closed Watersheds:** The Green River Municipal Watershed is not closed to the public. Although the City of Tacoma through agreements with the USDA Forest Service and private landowners maintains locked gates to restrict public access to portions of the Green River Municipal Watershed, it is not closed to public access throughout the HCP Plan Area. The USDA Forest Service manages many National Forest lands within the Green River basin for multiple use. By agreement between the City of Tacoma and the USDA Forest Service, "the parties may agree to jointly sponsor City/Forest Service signs at road entry points and other locations within the drainage," however, "[n]o jointly sponsored sign

shall have the effect or intent of limiting public use of National Forest lands or roads with public use rights.”

Services’ Response: The Services concur with the comment. The text of the document will be modified to reflect this correction.

Text: DSEIS page 1-2: “The IA explicitly provides that the Services will approve modification of the HCP to accommodate a land exchange provided that it does not compromise the effectiveness of the HCP or result in a level of incidental take beyond that analyzed and authorized in the original HCP and ITP.”

10. Comment on Incidental Take: As explained elsewhere in these comments, the modification of the HCP will compromise the effectiveness of the HCP and result in a level of incidental take beyond that analyzed and authorized by the Services. Therefore the Services are not required to approve the proposed modification of the HCP.

Services’ Response: The Services believe the modified HCP would meet the Section 10 issuance criteria just as the original HCP did. The modification will not compromise the effectiveness of the HCP, nor will it “result in additional incidental take of Permit Species not analyzed in connection with the original HCP,” for the same reason discussed in the last paragraph to Muckleshoot Indian Tribe comment #4 (C.I, 4).

Text: DSEIS page 1-3: “The existing HCP was previously subjected to environmental review under NEPA...This review involved input from...Tribes...Input was gathered during meetings with the Tribes...The DEIS and FEIS were also made available for...public comment and review...”

11. Comment on Tribal Consultation: The Services failed to consult with the Muckleshoot Indian Tribe prior to releasing the HCP and DEIS for public comment. The first and only policy-level meeting the Services held with the Tribe occurred on 26 March 1996, more than two months after the extended comment deadline for the DEIS, and less than three weeks before announcement of the review period for the FEIS. Furthermore, the Services were wholly unresponsive to the “input” provided by the Tribe during the NEPA review process. Although the Services’ response to comments on the FEIS states “[s]ubstantive changes were made to the proposed HCP and concomitant changes were made in the EIS to analyze those changes” (ROD p. 35), the Services do not claim any of the “substantive” changes to the HCP were responsive to concerns raised by the Tribe, for indeed none were.

Services’ Response: Members of the various Tribes, including the Muckleshoot Indian Tribe, were involved to some degree early on in the HCP-development process. This early involvement came mainly through Plum Creek Timber Company and not through the Services. Additionally, staff of the Muckleshoot Indian Tribe and the Yakama Indian Nation were participants in the scientific peer review of technical papers. However, the Services are actively working to routinely involve Tribes early in HCP development. The Services are also trying to better include Tribes in HCP implementation, particularly the Plum Creek Timber Company Cascades HCP.

It is clear from the Services experience on this HCP, that reading comment letters alone is not sufficient to understand all of the issues. Face-to-face meetings, whether they be government-to-government meetings at the policy level, or in-the-field discussions at the technical level will provide the best understanding of the issues and provide the best opportunity to find workable solutions. The

best example of this was a September 1996 field trip to the planning area, attended by the Services, the Tulalip and Muckleshoot Indian Tribes, and Plum Creek.

With regard to this proposed HCP modification, the Services sent two letters to the Tribes early in the process, called Tribal staff on the telephone to solicit comments and concerns, and scheduled a series of meetings with the Muckleshoot Indian Tribe. We are pleased with the current level of dialogue and hope that it continues beyond this modification and throughout the permit term. The Services hope to continue this current course of action.

- 12. Comment on Watershed Analysis Participation:** For example, consider the Services' response to the Tribe's request to modify the HCP "to include the participation of federal agencies within a process following the guidance of watershed analyses [per Chapter 222-22 WAC], but which allows the federal agencies...final approval authority of the completed analyses and prescriptions" (Muckleshoot Indian Tribe DEIS comments, p. 2, emphasis added). Instead of requiring such federal oversight, Section 3.3.2 of the HCP was modified to "invite at least one representative from either the FWS, NMFS, WDFW, or a local Tribe to participate on the [prescriptions] team" (FEIS p. A-147, emphasis added). The Tribe did not request the Services or Plum Creek to invite the Tribe's participation on prescription teams because that is already clearly provided for under WAC 222-22-070.

Services' Response: The Services do not have the staff to attend and approve each watershed analysis. We do rely on the participation of other agencies and the Tribes in that respect. While it may not appear that specifically naming the Tribes on the list of those invited to participate provided any additional assurances, the Services felt this was a strong statement about the value of Tribal input, but also made the inclusion of Tribal participants an HCP requirement going beyond the State regulations. This change was also made in response to a comment by the Muckleshoot Indian Tribe that the HCP does not ensure the ability of the Federal or tribal involvement in the watershed analysis process (FEIS page A-42)(ROD page 59).

- 13. Comment on Services Participation in Watershed Analysis:** Note also that to date the Services have only once or twice dispatched representatives to attend prescriptions meeting pertaining to portions of the Green River basin within the Planning Area, to little or no effect on the process.

Services' Response: The Services sent several staff to regularly participate in the Lester Watershed Analysis. Our approach was to closely track one watershed analysis within the Planning Area, and then to use it to judge the adequacy of the process as well as to use it as an example for others to follow. The Services do note that the Muckleshoot Indian Tribe had requested participation of the Fish and Wildlife Service. The Services requested notification of dates, times, and places of the meetings at which the Tribe most wished Federal representation. No response was forthcoming. However, this is clearly an area the Services should have pursued more aggressively.

14. Comment on Shortcomings of Watershed Analysis: The Services' misunderstandings of the shortcomings of the watershed analysis process on which they rely (absent the meaningful federal participation, oversight, or approval requested by the Tribe) are demonstrated by another change authorized to Section 3.3.2 of the HCP, which states: "[f]or areas prone to landslides (e.g., such as inner gorges), road construction [is] generally prohibited" (FEIS p. A-147). In truth, road construction is not prohibited across any inner gorge (or any other identified slide prone area) under any prescription thus far approved or considered by the Washington Department of Natural Resources for any portion of the Green River basin within the HCP Planning Area.

Services' Response: *The Services do not rely on watershed analysis for riparian protection (ROD page 59). Watershed analysis does not contain a wildlife module. For instance, this lack of confidence in watershed analysis as a solution for wildlife needs is the reason the Services and Plum Creek instituted minimum HCP buffers which cannot be made smaller as a result of watershed analysis.*

Watershed analysis prescriptions for inner gorges identify avoidance as the preferred option. Road crossings are not outright precluded because each inner gorge situation is unique and there may be instances where road crossings are possible without jeopardizing fish habitat or water quality. Some of these situations are identified explicitly in the prescriptions, and criteria for proper road construction (e.g., temporary roads) are provided. Other situations require the involvement of a geotechnical expert. In any event, newly constructed roads rarely cross inner gorges. Among the 49 harvest units that have been completed since the HCP was signed, 24 units have involved inner gorges. All 24 units received a minimum 50-foot, no-harvest buffer. Two of the inner gorges were crossed by temporary roads in accordance with the watershed analysis prescriptions and abandoned following completion of harvesting operations. It should be noted that approximately 50% of the Type 4 and 5 stream protection has been 50 foot no-harvest buffers instead of the 25 foot RLTA buffers for Type 4 and no buffers for Type 5 (see the Table of stream buffers in the Green River Watershed contained in the Services' response to Muckleshoot Indian Tribe comment 81). In other words, instead of 56 miles of 25 foot RLTAs for Type 4 streams after watershed analysis it is expected that there should be 28 miles of 25 foot RLTAs and 28 miles of 50 foot no-harvest buffers. For Type 5 streams instead of 217 miles of no buffers, one-half or 108 miles of streams should have a 50 foot no-harvest buffer.

Text: DSEIS page 1-3: "The Services' purpose in conducting this environmental review is to determine the anticipated environmental impact (beneficial or adverse) which will result from implementation of the proposed HCP modification, as compared to the original Federal Action (approval and implementation of the original HCP).

15. Comment on Determining Impact in the Green River: With regard to salmonid habitat in the Green River basin., the Services fail to achieve their purpose "to determine the anticipated environmental impact which will result from implementation of the proposed HCP modification." As discussed elsewhere in these comments, the Services' analysis of impacts to salmonid habitat relies on data pertinent to the Planning Area (which comprises at least two chinook salmon ESUs), not the Green and Yakima River basins (which contain distinct chinook salmon ESUs), *for which the Services have yet to consider variations between "beneficial or adverse" impacts that will result from differences in the proposed management of the effected stream segments in each basin.*

Services' Response: *The Services believe they have considered these impacts in both the original documents associated with development of the HCP and in the DSEIS. However, the Services have*

agreed, as discussed earlier in these responses, to include revised tables in the FSEIS, which will display information for the Green River Watershed.

Text: DSEIS page 1-3: ..".the Services must determine if the proposed HCP modification is consistent with the standards and procedures set forth in the HCP and the IA."

16. Comment on Consistency with HCP: The FSEIS should contain an analysis demonstrating the extent to which the proposed modification is consistent with the HCP and the IA. The FSEIS should also (1) state the quantity of salmon authorized for take under the Incidental Take Permit, and (2) within the FSEIS (or an attached appendix) an analysis of how extending lands to areas currently not covered by the HCP will not increase the absolute authorized take. It is only by presenting such information that the environmental impacts of the Services' decision can be weighed.

Services' Response: As mentioned earlier in response to the comment on quantification of take, the permit does not specify the number of individuals which may be taken. The authorized take is that which may occur from implementation of the plan. Additionally, other than Columbia River distinct population segment of bull trout (Yakima River Basin), there are no fish currently listed on the permit. A Biological Opinion documenting the anticipated level of take will be completed prior to the addition of any species to the incidental take permit. Additionally, though not yet required, the Services plan to revisit our findings to ensure they remain valid.

Text: DSEIS page 1-4: "The SEIS process has involved and will involve: internal, interagency, and tribal scoping" and on page 1-7: "The scoping process associated with this DSEIS consisted of ... and Tribes. No formal public scoping was conducted."

17. Comment on Tribal Scoping: A review of the letters held by the Tribe indicates that any request for scoping was ambiguous and did not clearly confer that the purpose of the communication was to solicit input upon the scope of the EIS.

Services' Response: Although the Services did not specifically state that we were soliciting input on the scope of the SEIS, we do feel that an honest effort was made to keep the Tribes informed as indicated by the following excerpts from Services letters. On July 25, 1997, the Service wrote to four staff members of the Muckleshoot Indian Tribes and five staff members from three other Tribes. In that letter the Service said ..".One of the areas which may be of interest to the Tribe is the proposed land exchange between Plum Creek and the U.S. Forest Service. This proposed exchange may result in a significant change in the lands covered by the HCP. This may also alter the ownership of lands within your Usual and Accustomed Areas. This exchange would precipitate an HCP amendment. In this context, other changes may also be desirable or necessary and Government-to-Government meetings in this regard may be appropriate..."

On May 8, 1998, the Services wrote to the Muckleshoot Indian Tribe with courtesy copies to three staff, and also wrote similar letters to other Tribes and WDFW in which the Services said "By now, you are likely aware of the proposed land exchange being explored between Plum Creek Timber Company, L.P. (Plum Creek), and the U.S. Forest Service (FS). This exchange could involve lands from three National Forests and a considerable amount of Plum Creek's land within the planning area of the Interstate-90 Habitat Conservation Plan (HCP), which was signed on June 27, 1996."

"The U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) (together referred to as the Services) anticipate that if the land exchange is consummated, Plum Creek

will request modification of the HCP to add any newly acquired lands. Inclusion of lands acquired through this type of an exchange were anticipated and described in the original HCP. To that end, the Services are beginning discussions with Plum Creek regarding the form and content of such a modification to the HCP.”

“The Services will have a representative available at the upcoming FS meetings (May 13-21) to engage members of the public with an interest in the HCP. You are welcome to stop at our station and introduce yourself, should you be present at one of these meetings.”

“However, we are specifically interested in your concerns, questions, and thoughts regarding a change in covered lands and would like to schedule a meeting with you, or, if you prefer, exchange information via the telephone, telefax, or electronic mail. We believe a meeting with our Washington State and Tribal cooperators may allow us to discuss the relationships of this project to other actions on this landscape in an interactive format.”

- 18. Comment on Ecosystem Management in Matrix:** USDA Forest Service management of Matrix lands in the HCP Planning Area is a component of “ecosystem management” under the NWFP. Although Matrix lands serve ecosystem management differently from other lands managed under the NWFP, there is no less emphasis on ecosystem management on Matrix lands. The effected Matrix lands in the HCP Planning Area, and the Riparian Reserves within those designated Matrix lands, both serve roles in ecosystem management under the NWFP, and those roles will be compromised by the proposed modifications to the HCP. Additionally, the management of the Riparian Reserves under the NWFP is essentially the same regardless of whether those reserves are within lands designated as Matrix, AMA, LSR, etc. Therefore, from the viewpoint of wood recruitment to salmonid bearing streams, trapping and routing of sediment, and other habitat elements linked to riparian areas, the management of Matrix and non-matrix lands provides similar protection for riparian areas and the resultant benefits to salmon.

***Services’ Response:** The Services acknowledge that ecosystem management is a component of all land-management designations under the NWFP. The Services will correct the text in the FSEIS. However, we do not agree that the roles of those lands will be compromised by the proposed modification to the HCP.*

- 19. Comment on Differences between NWFP and HCP:** A discussion of differences between Plum Creek’s Riparian Management Areas (RMAs) and the Riparian Reserves under the Aquatic Conservation Strategy could be readily incorporated into the FSEIS for the proposed amendments. The I-90 Land Exchange Draft Environmental Impact Statement has such a discussion. Though that document has been incorporated by reference into the DSEIS, much of the detail in that DEIS should be extracted and brought forward into the FSEIS for the proposed amendments so that reviewers have sufficient information in one package.

***Services’ Response:** The Services note that there is not much functional difference on larger streams between the Aquatic Conservation Strategy within the NWFP and the Riparian Habitat Areas of the HCP. Fish-bearing streams receive 200-foot buffers measured horizontally under the HCP while the NWFP ACS requires 300-foot buffers measured on the slope. On many slopes in the Planning Area there is less than 30 feet of difference. On most perennial nonfish-bearing streams, the HCP requires 100-foot buffers measured horizontally. Both the NWFP and the HCP include adaptive management; however, under the HCP, adaptive management will be used to add protection to the strategy, while under the NWFP, additional actions may be planned for the buffers as new information indicates those are permissible. See also, Services’ response to Muckleshoot Indian Tribe Comment 1a.*

It is on smaller streams that the differences are greatest. On seasonal streams, the HCP does not require buffers, although they will be provided in many cases due to logistics of upland leave tree distribution and for other reasons. The NWFP explicitly buffers all seasonal streams. Some perennial streams in the Green River Watershed receive smaller 25-foot buffers or an alternative pattern of clumping, and some may not receive buffers. Watershed analysis is also adding protection to many of these smaller streams. In over half of the reviewed situations, watershed analysis in the HCP Planning Area is requiring at least a 50-foot no-harvest buffer. What is important is the protection of the resource, not how one plan compares to another. The NWFP is not a standard designed for comparison of management on non-Federal lands. It was a plan put into place to manage Federal lands in a manner that can incorporate new information as we learn, while acknowledging that Federal lands are expected to provide the majority of conservation for many species.

Text: DSEIS pages 1-5 and 1-6: “Scenarios that increase Federal ownership and management for LSR and AMA and reduce Matrix lands and [logging] within the Planning Area are presumed to maintain or improve the function of the HCP. The I-90 Land Exchange is consistent with these land exchange scenarios and is favorable to habitat conservation.”

20. Comment on Green River Specificity: The presumption that an increase in “Federal ownership and management for LSR and AMA,” or a reduction in “Matrix lands and [logging] within the Planning Area” will “maintain or improve the function of the HCP” is fallacious with respect to salmonid habitat in the Green River basin which supports salmon ESUs distinct from the coho and chinook ESUs east of the Cascade Crest. The quality of salmonid habitat in the Green River basin cannot be maintained or improved by decreasing the length and width of riparian buffers in the basin as proposed. For the same reason, with respect to salmonid habitat in the Green River basin, the I-90 Land Exchange is not favorable to habitat conservation.

Services’ Response: The Services acknowledge once again that inclusion of information and tables specific to the Green River Watershed is appropriate for the FSEIS. We also acknowledge that the net change in the Green River Watershed will be a decrease in acres in riparian buffers. We do not believe that translates into a meaningful decrease in functional riparian protection for the Green River Watershed. See response to comparison of NWFP and HCP riparian protections discussed above.

21. Comment on Cumulative Effects of Land Exchanges: Furthermore, the Services have written that “[I]t is this Administration’s policy, that where possible, the Federal Lands will make significant contributions to the conservation of listed species. Where additional mitigation is required the Services will first turn towards Federal Lands. However, the area of Federal land in the Green River basin is declining due to past and proposed land exchanges, one of which is the cause of the proposed amendments to the HCP.

Services’ Response: The Services concur with the comment. We note it is not within our authority to approve or disapprove these land exchanges, merely to assess their relative merits with respect to resources under our jurisdiction.

22. Comment on Conservation of Green River Salmon: With a declining base of Federal land, the FSEIS should clarify (1) how reducing the Federal land base in the Green River makes it possible to make significant contributions to the conservation of the chinook salmon Puget Sound ESU, and (2) what limitations upon the availability of additional mitigation, if additional mitigation is required, are being explicitly and implicitly accepted by the Services. Potential impacts upon the recovery of listed or potentially listed species in the Green River should then be analyzed for each applicable ESU.

Services' Response: The Services believe that: (1) reduction in Federal lands, given the Plum Creek HCP standards, will not result in substantial decreases in the contribution of these lands for the conservation of chinook salmon in the Puget Sound ESU. The Services acknowledge that there will be a short-term decrease in buffers for some stream types with a concurrent, but unquantifiable, potential decrease in the amount of large woody debris recruited, and (2) the Services accepted a limit to additional mitigation when we signed the Implementation Agreement with "No Surprises" assurances. However, within those assurances the Services maintained flexibility to take certain actions in certain situations. The Services signed an agreement that allowed adaptive management to be used as needed for aquatic issues including anadromous salmon. We continue to believe that both before and after the land exchange, this HCP provides the necessary conservation to allow recovery of those stocks to occur.

Text: DSEIS page 1-6: "Following implementation of the I-90 Land Exchange, a large portion of the lands acquired by the Forest Service would be managed in accordance with the Snoqualmie Pass Adaptive Management Area Plan. (SPAMA). Under SPAMA, newly acquired Federal lands would be managed to provide a distribution of forest age and structural classes and stream environments that provide habitat for late-successional and old-growth plant and wildlife species on National Forest lands."

23. Comment on Outgoing SPAMA Lands: Here the Services neglect to describe the other side of the equation or consider its relevance to salmonid habitat in the Green River basin. The statement should be amended to note that lands designated as SPAMA under the NWFP, which are to be acquired by Plum Creek in the Green River basin following the I-90 Land Exchange, will diminish protection of habitat for late-successional and old-growth plant and wildlife species and increase adverse impacts to salmonid habitat in the Green River basin.

Services' Response: The Services acknowledge that the amount of late-seral habitat may decrease and that the amount of land in riparian buffers may decrease. Whether these changes would manifest themselves in a net impact to late-seral wildlife species or result in adverse impact to salmon is a matter of interpretation. We do acknowledge that there will likely be some effect to fish and wildlife as a result of this exchange in the Green River Watershed. However, we believe inclusion of acquired lands in the existing HCP will ameliorate these effects of the land exchange.

Text: DSEIS page 1-6: “A Draft Tacoma Public Utilities HCP was released for public review in November.”

24. Comment on Tacoma HCP: This HCP seeks coverage for a variety of actions, including actions proposed as part of the Howard Hanson Additional Water Supply Project. Actions envisaged under this project, for which a Final Environmental Impact Statement has been released and the comment period closed, include a trap and haul operation to transport adult chinook and coho salmon above the Tacoma Public Utilities (TPU) Diversion Dam and the US Army Corps of Engineers Howard Hanson Dam on the Green River. These adult fish, part of the Puget Sound Evolutionary Significant Unit for chinook and the Puget Sound/Strait of Georgia ESU for coho, will then spawn naturally in the Green River within the HCP Planning Area.

Services’ Response: The Services note and will correct the text regarding the Tacoma HCP. That project was merely in the scoping phase during that time period and has not yet been released for public comment. The Services will note the actions as cumulative actions under NEPA (under NEPA, future Federal actions are included as cumulative impacts). For purposes of any biological opinions, these actions will not be considered cumulative impacts. Instead, they will eventually go through section 7 consultation and be incorporated into the baseline at the time a biological opinion is completed for those actions. The Services placed additional emphasis on protection of aquatic functions in the Yakima River basin at the time of the original HCP since that basin had naturally spawning anadromous salmonids. However, this does not mean the lesser level of emphasis in the Green River will preclude the ability of the Green River salmonids to eventually spawn and recolonize the Green River. Instead, the higher standard offered by the HCP in comparison to State Forest Practices Rules and Regulations should enhance the ability of the stocks to recolonize and spawn successfully in the Green River Basin once passage issues are resolved. The Services are encouraged by the progress at providing fish passage above the Howard Hanson Dam on the Green River.

See Services’ response to Muckleshoot Indian Tribe Comment 1a. We also note that in their 1996 assessment, NMFS acknowledged that passage/introductions of salmonids above Howard Hanson Dam was likely in the future. The assessment also acknowledged that coho and steelhead had been planted historically in the Green River basin, and NMFS provided a discussion of the impacts of the HCP on those plantings. Coho and Steelhead in Green River were acknowledged in the HCP and shown on Figures 24 and 25. The Services acknowledge the plantings of Chinook and the importance of those plantings

Text: DSEIS page 1-6: [T]he proposed HCP modifications must not compromise the effectiveness of the HCP.

25. Comment on Outgoing Lands and Standards: The proposed modification to the HCP will compromise its effectiveness to maintain or improve salmonid habitat in the Green River Basin by reducing the net length of riparian buffers in the basin, and reducing their width by as much as 150 feet. Therefore, in the Green River Basin, the lands to be managed by the HCP will have considerably less protection than they currently have.

Services’ Response: The Implementation Agreement allowed the Services 60 days to review the proposed exchange of Plum Creek lands to the Federal Government to ensure that such sale or exchange will not compromise the effectiveness of the HCP. With respect to lands acquired by Plum Creek from the Federal Government the standard regarding whether a minor modification is

appropriate would be whether the incidental take of Permit Species will increase. Currently, there are not any listed fish Permit species in the upper Green River Watershed.

- 26. Comment on NWFP and HCP with respect to Large Woody Debris Recruitment:** Most of the land in the Green River basin proposed for exchange to Plum Creek includes stream segments with high LWD recruitment potential, lands which would have contributed LWD to the downstream reaches. The riparian management standards of the HCP differ significantly from those of the Aquatic Conservation Strategy in terms of buffer width and composition for all stream types. The extent to which these differences in standards will influence downstream water and habitat quality has not been analyzed in the SDEIS. The extent to which the declines in downstream large woody debris piece count and volume will influence the quality of habitat and hence the take of chinook salmon does not appear to be addressed in the DSEIS. As the private lands, whether held by Plum Creek or other private or public landowners above Howard Hanson Dam, contribute to the effectiveness of the HCP, the extent of habitat degradation needs to be addressed in the FSEIS.

Services' Response: The Services have acknowledged that some decrease in the amount of large wood recruited to streams is likely as a result of the land exchange, due to differences in buffering requirements. However, based on watershed analyses completed in the Lester and Upper Green/Smay Creek, the Services believe that the Riparian Management Strategy in Plum Creek's HCP still provides adequate opportunities for large woody debris recruitment to support salmonid habitat in the Green River Basin.

Text: DSEIS page 1-6: ..”, the proposed HCP modifications must not increase the level of incidental take of permit species beyond that analyzed and authorized in the original HCP and ITP

- 27. Comment on Quantification of Take:** The Services should define the authorized level of take by number for each species. This information should be presented in the FSEIS so that reviewers will have a better understanding of what the Services mean by level of incidental take. It appears from the wording used in the DSEIS, that if expanding the coverage to new areas and reducing the protection currently in place in these areas, that the level of take is a relative quantity, not an absolute. The FSEIS should also clarify whether the Incidental Take Permit issued to Plum Creek will allow Plum Creek to take more of the species if the populations of listed species begin to recover.

Services' Response: The standard regarding increased incidental take is made in reference to the Implementation Agreement clause regarding land acquired from the Federal Government and with respect to Permit Species. The Services once again note that there are no aquatic Permit Species within the Green River Basin at this time. Therefore, there is no increase in take of such species.

With respect to whether Plum Creek would be allowed to “take” more individuals of a species than it currently does if the species were to recover, the answer is “Absolutely.” An important concept in HCPs is how many members of the species will be left following conduct of covered activities. By maintaining the species on the landscape, it is inevitable that future take will occur. In comparison, another HCP which might include short-term, but complete take of a species within such an HCP area would ensure that there would be little to no future take. For these reasons, amount of take over 100 years would only tell a fraction of the conservation story. A better measure would be a concept such as anticipated carrying capacity.

Whether the species are anadromous salmonids in the /Green River Basin or grizzly bears and gray wolves in the I-90 Lakes subunit of the HCP, the concept is the same. There is little to no take of these

species at present. Should they become regularly established, some small level of take would occur in a manner that would allow them to recolonize and persist. In this manner, take would increase from zero to some positive level as reestablishment occurs. Two Biological Opinions have been completed to date on this HCP: June 24, 1996, and July 13, 1998. These documents are herein incorporated by reference.

- 28. Comment on Foreseen Occurrence of Land Exchange:** In regard to the proposed land exchange, the Services wrote on page A-127 of the FEIS for the original HCP: *However, the size and timing of the exchanges could not be reasonably forecasted, therefore such exchanges are not included in the HCP.* If the size of the exchange was unknown, it is unclear how the effects of the possible exchanges were considered in the original EIS, and thus how the level of take authorized by the proposed amendments compares to that already authorized. Furthermore, the Services [on page 38 of the Record of Decision] have written: [F]or purposes of NEPA Analysis, the Affected Environment Section of the NEPA environmental Documents describes the baseline conditions in the Planning Area to enable a comparison of differing level of effect that would result under each of the action alternatives. This appears to be at odds with statements with the DSEIS that the original environmental review considered impacts of the I-90 Land Exchange.

Services' Response: *Clearly, the Services do not believe that the original NEPA document should be relied on alone for these impact assessments. The Land Exchange itself addresses impact of the exchange. This supplemental EIS is prepared to further update the original EIS prepared for issuance of the HCP. The original EIS for issuance of the ITP addressed impacts regarding three broad categories of exchange. This particular exchange represents a combination of the two scenarios the original HCP and EIS viewed as positive or beneficial for fish and wildlife resources overall. In this manner, the original NEPA documents did consider inclusion of an exchange similar to this exchange.*

- 29. Comment on Limiting Factors Analysis:** Additionally, the FSEIS should also incorporate portions of the Fisheries Limiting Factors Analyses for the original HCP, as well as any updates prepared for summer/fall chinook in the Green River. This information will assist reviewers to determine the potential for amendments to the HCP to increase take.

Services' Response: *The HCP modification does not propose to increase the level of incidental take analyzed and authorized under the existing incidental take permit. The Limiting Factors Analysis is incorporated by reference into the original HCP. There have been no updates with respect to that analysis. These and other documents remain available for those wishing to calculate the potential for such amendment to increase the impact upon Green River stocks of salmon.*

Text: DSEIS page 3-3: "Both municipal watersheds are closed to the public."

- 30. Comment on Closed Watersheds:** See comments for DSEIS p. 1-1.

Services' Response: *This statement has been clarified in the FSEIS. See response to Muckleshoot Indian Tribe Comment 9.*

Text: DSEIS page 3-4: “Within the Planning Area there are six different geologic districts: sandstone, basalt, andesite, mixed volcanic, granite and metamorphic. The distribution of rock types is used in the evaluation of slope stability and soil erosion in the Planning Area.”

31. Comment on Rock Types and Slope Stability: The Services neglected to explain: (1) how the “six different geologic districts” relate to the “distribution of rock types,” (2) what is the source for information about the “six different geologic districts” in the Planning Area, (3) how the “distribution of rock types is used in the evaluation of slope stability,” (4) who conducted the evaluation of slope stability using the distribution of rock types in the Planning Area, (5) why the evaluation is not cited, or (6) how the evaluation relates to the proposed modification to the HCP.

Services’ Response: The rock types described in the DEIS are useful to provide reviewers with contextual information as described in the comment above. However, these descriptions are not specific enough to be used “on their own” for the detailed mapping of mass wasting units in watershed analysis. Any reference in the DEIS to their use in this manner is incorrect. The FSEIS will be revised where appropriate to address this comment.

Geologic districts are areas of distinctive rock types or parent materials that are generally associated with major structural features. They are not only characterized by a dominant rock type, but by inclusions of contrasting rock types. Geologic districts often correspond with areas of distinctive hydrologic character. Structural features, such as basalt flows or granite batholiths, are the templates on which streams have etched drainage patterns. The hydrologic character of the landscape is also influenced by the degree to which the parent material has weathered (producing sediment) and the water-handling characteristics (e.g., porosity, retention, etc.) of the parent rock and its weathering products. The hydrologic character of hard rock (e.g., quartzite) that weathers slowly to mixed sizes (e.g., silt, sand, gravel, and cobble) is different from that of soft rock (e.g., tuff) that weathers rapidly into fine-textured sediment. The distribution of rock types for geologic districts within the Planning Area were listed in Jensen (1995; Table 3.2-2). Jensen (1995) (also known as Technical Report # 7, with respect to Plum Creek’s HCP) goes on to explain how other landscape-classification information is used to develop predictive tools regarding stream types and potential hazards. These tools are available for use in a variety of ways in the HCP.

Regarding how the evaluation relates to the proposed modification, the information was provided in the DSEIS to give the reader an understanding of the foundations of the HCP. This information will continue to be used following modification as it was prior to modification.

Text: DSEIS page 3-4: A brief description of water quality and quantity within and surrounding the planning area is provided below. An expanded discussion is provided in Section 3.4 of the original EIS, and is incorporated here by reference,

32. Comment on Extent of Water Quality Discussion: The discussion of water quality in the EIS for the original HCP is cursory and overlooks numerous problems with water quality in the Green River basin above Howard Hanson Dam.

Services’ Response: The description of water quality in the EIS for the original HCP is an adequate description for the context of the HCP. It summarizes the situation enough so that the reader may evaluate the benefits derived by implementation of the HCP.

33. **Comment on 303(d) List:** For example, Smay and Gale Creeks are on the 303(d) lists,

Services' Response: HCP Figure 23 does not indicate any 303(d) listed streams in 1996 in the Green River Basin. Figure 27 shows the identified 303(d) listed streams in the Yakima River Basin. We believe these figures accurately reflected the 303(d) streams present at time of issuance decision.

34. **Comment on Extent of Water Quality Problems:** The fact that Smay and Gale Creeks are on the 303(d) lists, means that the state and EPA recognize that these temperature violations are due to human activity. The US Army Corps of Engineers has written "inflows to the Project above 60 degrees F degrees occur in most years Muckleshoot Indian Tribe monitoring of streams has noted that the following streams have been observed to exceed 16 degrees C (60 degrees F): Green, Sunday, Intake, Charlie, Tacoma, Friday, Cougar and Sylvester. Given the lack of temperature monitoring above Howard Hanson Dam, the extent of water quality problems in streams is probably understated.

Services' Response: The Services acknowledge that water-quality problems may be understated and that the exact level of the problem is unknown. The Services note that the HCP reflected the 303(d) listed streams at time of issuance decision. The Services assume that to further foster cooperation among entities in the Green River Basin, that the Muckleshoot Indian Tribe has forwarded their monitoring data to the Services, other Federal agencies, and private landowners for review and comment.

35. **Comment on Temperature-related 303(d) Streams:** This issue becomes important because of the extent to which the land in the Green River proposed for transfer to Plum Creek will have fewer shading trees, if any along Type 4 and 5 waters compared to the buffers that would be present if the land remained in Federal ownership. Contrary to popular belief, many Type 5 streams flow year round and hence would be exposed to the sun and contribute to downstream temperature problems.

Services' Response: The HCP does not rely on DNR 1-5 water types. The HCP provides buffers for fish-bearing streams, whether they are perennial or seasonal. Nonfish-bearing streams are divided into perennial or seasonal. Most perennial streams are expected to receive buffers that will maintain shading. Perennial streams that will not receive explicit buffers under the HCP are expected to be primarily above 5,000 feet in elevation and only encompass a very small percentage of streams. The HCP also includes specific monitoring of temperature as well as an experimental design to determine effects of various buffer scenarios on stream temperature.

36. **Comment on Sediment Production:** The DEIS for the I-90 Land Exchange states that fine sediment production from roads and timber harvests is recognized in Federal Watershed Analysis for the Upper Green River as limiting aquatic habitat and water quality in the Green River. The extent to which these issues have been factored into the Services estimation of take is unknown.

Services' Response: The Services have factored these sources of sediment into its estimation of impacts to aquatic habitat and water quality. The Services and Plum Creek agreed to use the more-rigorous Timber-Fish-Wildlife (TFW) derived watershed analysis rather than utilize the Federal watershed analysis process. Fine-sediment production was indeed a primary consideration in ongoing or completed watershed analyses in the Lester, Green/Sunday, and Howard Hanson/Smay Creek Watersheds.

With regard to “take”, perhaps the greatest insight into how the Services address this can be gathered from examining the Biological Opinion for bull trout recently completed for a portion of the Planning Area (USFWS July 13, 1998), and general principles which would apply in any such case.

First, the potential for negative impacts must be considered in the context of the actions proposed; the extent, duration, and intensity of such actions; the lands on which such actions will be conducted and covered by the permit; the landscape context of such actions and other actions occurring on the landscape; and the localized vulnerabilities of resources from such actions. This is where information such as geology and rock type discussed earlier can be very important, as can information about the distribution of affected species.

Roads can be a major source of management-related sedimentation in streams, especially in areas prone to mass-wasting or erosion. A small percentage of the road system is often a major source of management-related sedimentation in streams and other impacts to stream habitat.

Second, the proposed Conservation Measures must be considered in relation to the proposed actions. In Plum Creek’s case, the HCP’s management objective for roads is to minimize disturbance of RHAs and to prevent [reduce] sediment delivery to streams. If a road is required to be built through an RHA, Plum Creek will implement the Company’s road building/ maintenance practices (HCP Section 1.2.3.4) and implement specific measures to reduce the potential effects of road construction and use on streams and riparian habitat areas by following a list of steps which includes, but is not limited to, cross drainage or ditch-line relief features to minimize water velocity, armoring (stabilizing) culvert head walls, and construction of stable cut-and-fill slope angles. Additional erosion-control measures typically used at road-construction sites include grass seeding, sediment filters, straw matting, ditch-line energy dissipaters, and appropriately placed rip-rap. Road-decommissioning techniques also include steps such as removal of culverts; grass seeding; strategic placement of bio-matting; and construction of sediment traps.

Watershed analysis addresses the water-quality parameters typically impacted by forest practices, such as stream temperature, turbidity, and sediment input. For instance, the most-pervasive problem identified in the Quartz Mountain Watershed Analysis was the excessive amount of fine sediment in Taneum Creek. Based on the resource assessment, 20 prescriptions were developed to improve the conditions of the watershed and to avoid potential problems in the future. A 5-year, road-improvement and maintenance plan was developed to reduce the amount of fine sediment entering the streams. The improvement and maintenance plan include placement of additional culverts, revegetation of cutslopes, and road closures. In addition, new roads will only be built if sediment production from all roads in the watershed is reduced to specified annual target levels. In addition, all such prescriptions are subject to monitoring and feedback, in keeping with the HCP monitoring program. If monitoring results indicate that prescriptions are ineffective or inadequate, the prescriptions will be changed to make them effective and adequate.

Thirdly, the combined results on habitat expected from the proposed actions and conservation measures must be considered. Maintenance of streamside vegetation contributes to reduction of sedimentation by filtration and storage of sediment in headwater streams through the action of large woody debris. Keeping sedimentation to near-natural levels contributes to the maintenance of spawning habitat and the diversity of aquatic invertebrates and other food items needed by bull trout. Maintaining cold water temperatures is also very important for bull trout. Water temperature is

controlled not only by shade (as influenced by canopy coverage of adjacent riparian stands), but also by other factors such as sedimentation. Sedimentation decreases pool depth and increases the capacity of streams to warm. Excessive sediment, when it does occur, not only affects bull trout by direct effects (e.g., infiltration of interstitial spaces), but also by indirect effects such as increasing temperatures by reducing channel depth, increasing channel width, and thereby increasing exposure to solar radiation.

Fourthly, effects to the members of the species must be assessed, in this case it is the fish found locally in Planning Area streams or immediately downstream of the Planning Area. All species of fish are sensitive to thermal fluctuations, suspended sediment, and alterations in streamflow regimes. Juvenile bull trout require cold-water tributaries with good cover (rocks and debris) and relatively little streambed sediment. It is generally believed that bull trout need habitat providing cold, clean water, complex cover, and stable substrate with a low percentage of fine sediments, high channel stability, and stream/population connectivity.

Sedimentation has been shown to cause negative effects on bull trout, although no thresholds can be set as clear tolerance limits for population maintenance. Preferred spawning habitat includes low-gradient streams with loose, clean gravels. Because bull trout eggs incubate about seven months in the gravel, they are especially vulnerable to fine sediments and water-quality degradation. Fine sediments can fill spaces between the gravel that are needed by incubating eggs and fry. Juveniles can be similarly affected, as they also live on or within the stream-bed cobble.

Emergence success of fry appears to be affected by the proportion of sediment in the substrate. Rearing densities of juvenile bull trout have been shown to be lower when there are higher percentages of fine sediment in the substrate. The close association of young bull trout with the stream-bed appears to be more important to bull trout than for other species. Due to this close connection to substrate, bed-load movements and channel instability can also negatively influence the survival of young bull trout.

With respect to cumulative effects, the Service considered that there is still a concern that habitat loss is occurring from latent, chronic sedimentation of streams from old roads and from previously harvested riparian leave areas which provide inadequate amounts of large woody debris and shading. Regrown riparian stands often begin to contribute "functional" wood within 40 years after harvest, but at an insufficient rate to offset decomposition and loss. Recovery of large wood requires regrowth of stream-side trees to sizes functional in the channel (key piece size) and recruitment of these trees into the channel. This is a long-term process (100 to 600 years), due to the time required for trees to become established, grow, and be recruited into the channel. Harvest of slopes may cause destabilization as roots decay until the reestablishment of mature conifer stands. Often, several times as many landslides occur in clearcuts as occur in mature forest. However, partial-harvesting slopes is thought to maintain an interlocking root system of mature conifers.

The impacts that the Services expected to occur with implementation included ..". Changes in sediment and water delivery to the channel network that may impact juveniles, fry, and eggs by increasing sedimentation rates or modifying flow regimes. These impacts are expected to be less frequent and of minor intensity with implementation of the HCP..." (Biological Opinion 1998).

Lastly, the Services must consider the effects to the species or distinct population segments. The Services must ascertain what percent of the range will be affected and how this relates to the species. Other considerations include what proportion of subpopulations will be affected and whether the actions will disrupt connectivity between subpopulations.

The final decision with regard to HCPs can be summarized in a single question: Will the proposed set of actions and measures provide for recovery of the species if all similarly situated land-managers were conducting similar actions? The interpretation here is that over a long permit term, such as 50 to 100 years, that there is only an academic difference between survival and recovery of the species with respect to issues surrounding habitat management. The same clean, cold, complex habitats are needed to provide for a continuing viable population and this is not different with respect to recovery or “non-jeopardy” levels. Similarly, the same conditions would be needed to produce harvestable surpluses of fish.

Sedimentation is a factor that was considered at each of these points in the process with regard to the Plum Creek Cascades HCP, and will continue to be considered as the HCP is implemented or as additional species may be added to the permit in the future.

Text: DSEIS page 3-5: “The Green River basin, defined as the area above the City of Tacoma’s diversion dam, encompasses 36,073 acres with ownership divided almost equally between National Forest (48 percent) and non federal land (52 percent).”

37. Comment on Green River Basin Acreage: Here the Services’ data specific to description of the effected environment in the Green River Basin conflict with information provided by other entities and agencies (see also HCP p. 8, and DEIS p. 3-20). An undated GIS plot, provided to the Tribe by the Tacoma Public Utilities Water Division entitled “Tacoma City Water Upper Green River Watershed Ownership” lists the area of the Green River Basin above the City of Tacoma’s diversion dam as 147,294.73 acres, approximately four times the area reported by the Services. The same GIS plot lists Plum Creek and USDA Forest Service watershed ownership as 34.5 percent and 24.2 percent, respectively, indicating ownership in the watershed is unequally divided between National Forest (less than 25 percent), and non-federal land (approximately 75 percent). Moreover, because the National Forest ownership listed on the City of Tacoma’s undated GIS plot does not reflect the net loss of National Forest land in the watershed resulting from either the Huckleberry or I-90 land exchanges, the actual disparity between National Forest ownership and nonfederal ownership is today substantially greater than indicated by the plot. The wording of the DSEIS implies that the current and future proportion of Federal Lands in the Green River is more extensive than is true. The extent of Federal Land ownership in the Green River above Howard Hanson Dam is important. See comments to pages 1-5 and 1-6 for additional details.

Services’ Response: 1) *In response to the discrepancy of acres in the Green River Basin, the acreage report was for that portion of the Green River Basin in the HCP Planning Area only, not in total. Accordingly, the ownership percentages are also in the HCP Planning Area. These figures have been updated in the response to Muckleshoot Indian Tribe comment 81;* 2) *The Huckleberry land exchange had greater potential for effects as outgoing Federal lands will not be managed similar to the HCP.*

Text: DSEIS page 3-5: “The mainstem of the Green River in the upper watershed is relatively straight with little braiding.”

38. Comment on Braiding: The source of this statement should be cited. This statement conflicts with that in the proposed TPU HCP.

Services’ Response: This statement was made based on site visits to the Upper Green River and evaluations of aerial photographs and maps. As stated, “the upper watershed is relatively straight with little braiding.” It is a relative description of the overall upper watershed. Much of the Upper Green River flows through confined channels, although there are areas with wide floodplains where some channel braiding occurs.

Text: DSEIS page 3-12: “Juvenile coho salmon, however, are outplanted into tributary streams upstream of the dam.”

39. Comment on Outplants of Chinook Salmon: The Muckleshoot Indian Tribe releases outplants of chinook salmon above Howard Hanson Dam for winter and early spring rearing as part of an anadromous fish restoration program in the Upper Green River.

Services’ Response: The Services so note and will modify the text for the FSEIS accordingly.

Text: DSEIS page 3-12: “Fish of primary concern (Special Emphasis Species) in the Planning Area include . spring chinook salmon.

40. Comment on Summer/Fall Chinook Salmon: The chinook salmon in the Green River are summer/fall chinook, not spring chinook. The comment letter provided to the Services for the original HCP noted that the Tribe planted chinook salmon above Howard Hanson Dam. This comment was not incorporated into the body of the FEIS for the HCP, nor addressed in the Services’ response to comments.

Services’ Response: The Services so note. NMFS’ Unlisted Species Assessment referred to chinook in the upper watershed as “fall chinook.”

Text: DSEIS page 3-13: “Based on DNR’s stream classification system, there are approximately 324 miles of fish-bearing streams...within the Planning Area (Table 28A. Modification document;)...approximately 86 miles or 27 percent of 324 total fish-bearing streams in the Planning Area are located on Plum Creek’s ownership.”

41. Comment on Miles of Fish-bearing Streams: The reported 324 miles of fish-bearing streams within the Planning Area is only about two thirds the total length of fish-bearing streams previously reported by the Services (cf. DEIS p. 3-17). The Services should explain the nature of this substantial change in their description of the Affected Environment, and specify its relevance to their analysis of Environmental Consequences.

Services’ Response: In the original HCP, miles along lakes were erroneously included as stream miles. The adjustment was made in the modification so the miles reported are for streams only. The lakes continue to have buffers and nothing has changed in the protection provided in the Planning Area. This had no impact in the Green River watershed.

- 42. Comment on Green River Statistics:** Moreover, on Page 3-13 of the DSEIS, the Services again rely on data pertinent to the Planning Area, and not the Green and Yakima River Basins. This avoids analysis of adverse impacts to salmonid habitat and the Puget Sound chinook ESU in the Green River Basin resulting from differences in the proposed management of effected stream segments in each basin.

Services' Response: See responses to Muckleshoot Indian Tribe Comments 8, 15, 20, and 37, regarding Green River statistics.

- 43. Comment on DNR Stream Typing:** Additionally, using DNR stream classification system to estimate the length and number of fish bearing streams typically underestimates the extent of salmonid distribution. The Muckleshoot Indian Tribe surveyed 118 stream reaches in the Green and White River basins in 1996 and 1997 for the presence of salmonids. Sixty-eight of the 118 stream reaches categorized as Type 4 or 5 streams, contained salmonids, and hence were Type 3 streams. Twenty-five of the 41 stream reaches (61%) which contained salmonids had gradients greater than 16% and 21 of the reaches containing salmonids had gradients greater than 20%. Nine of the streams had been previously surveyed by other entities which had reported to contain no salmonids, were found to actually contain salmonids.

Services' Response: The Services concur. We note that DNR stream types were only used to estimate the extent of fish-bearing streams and commensurate buffering strategies; Plum Creek's HCP requires field-verification. Because fish-bearing streams actually encompass a much higher percentage of the stream network, Plum Creek's contribution to salmonid conservation and conservation for wildlife species is actually much greater than estimated in these documents.

The Services assume that to enhance cooperation among entities in the Green River Basin, that the Muckleshoot Indian Tribes have forwarded their fisheries survey data to the Services, other Federal and State agencies, and private landowners for review and comment, and inclusion in management plans.

Text: DSEIS page 4-1: No Action Alternative.

- 44. Comment on No-Action Alternative:** This should not be considered as a viable distinct option since the land exchange is Congressionally mandated. Consideration should be given to a No-Action Alternative assuming the exchange, but with the lands managed under standards contained in Northwest Forest Plan and the Aquatic Conservation Strategy.

Services' Response: The no action is the only "No-Action Alternative." No action of modifying the HCP would mean the land exchange also does not occur. Congress did not mandate Plum Creek to exchange lands and Plum Creek maintains the option of not exchanging those lands. Congress's directive on the exchange is relevant to the Forest Service. On the other hand, a "No-Action" Alternative, assuming Plum Creek would acquire Federal lands and manage according to NWFP and ACS standards, would be an action alternative as it would require a change from current HCP standards or would require a change from State Forest Practice Rules and Regulations. Also, if the evaluation process had considered such an option, the final package of lands for the exchange might have looked quite different from the current proposal.

Text: DSEIS page 4-7: "...properly implemented HCP"

- 45. Comment on Properly Implemented HCP:** Throughout the DSEIS, there is a constant referral to the Company's properly implemented HCP. However, page 73 of the proposed modifications to the HCP indicate that the proposed Aquatic Resource Monitoring (HCP Section 5.1.6) element is behind schedule due to among other things, the proposed land exchange, the very exchange which other sections of the DSEIS state was considered during the issuance of the original HCP.

Services' Response: The aquatic monitoring is on schedule as the schedule was mutually modified by the parties to account for delays. It is true that the reason for the adjustment was due to this land exchange. This change is a minor modification because any impacts to the resources would not be substantial as foreseen due to the brief delay in association with proposed extrapolation.

- 46. Comment on Implementation Schedule:** The FSEIS should state to what extent other elements of the HCP are behind schedule and the impacts upon species of concern that delays caused by proposed land exchange.

Services' Response: The Services and Plum Creek have initiated five minor modifications to date. These include:

June 6, 1997, request by the Fish and Wildlife Service for modification to seasonal protections for spotted owls and northern goshawks, site management plans for bald eagles, and clarification of measures for talus slopes. (Approved June 25, 1997).

October 23, 1998, request by Plum Creek for modification of land base as a result of the I-90 Land Exchange. (still in processing).

November 2, 1998, request by Plum Creek for modification to the timing of aquatic monitoring and watershed analysis schedule (Approved November 16, 1998).

June 29, 1998, request by Plum Creek for modification to clarify inclusion of Plum Creek timber-harvest rights on 1400 acres of already included City of Tacoma lands. (Approved February 5, 1999).

January 15, 1999, request by Plum Creek for modification to the reporting timeframe changing the submission of the first report to "no later than December 31, 1999." (Approved February 17, 1999).

Text: DSEIS page 4-9: "All of the BMPs prohibit the degradation of aquatic resources in a manner that it impairs the suitability of water for any aquatic life."

- 47. Comment on Term "Prohibit":** The FSEIS should clarify if the term "prohibit" is the narrative description, or if the context of the term refers to what occurs on the ground.

Services' Response: The Services believe that the term "prohibit" is used in the narrative description. The BMPs and all other conservation measures contained in the HCP are designed to prevent degradation through responsible on-the-ground actions, but do not themselves "prohibit" degradation in a legal sense. The word "prohibit" has been replaced by "prevent."

Text: DSEIS page 4-9: [Alternative 1 - No Action]. watershed analysis will be conducted on an accelerated basis for all watershed administrative units.”

48. Comment on Conducting Watershed Analysis: The FSEIS should define in the narrative portion of the discussion of the alternatives, what is meant by performing or conducting watershed analysis. The process of watershed analysis consists of many parts, ranging from resource assessment to prescriptions, SEPA compliance and formal adoption. Rather than be hidden in the proposed amendments to the HCP or in the Abbreviations, Acronyms and Definitions, the extent to which the original and proposed amendments require Plum Creek to comply with each and all elements of the procedure for initiating watershed analysis through official adoption of prescriptions should be stated in the narrative portion of the FSEIS. Furthermore, it is unclear from the definition of Watershed Analysis presented on page 5-9 if the watershed analysis to which Plum Creek is committed requires any action beyond conducting the resource assessment phase of watershed analysis.

Services’ Response: The Services consider completion to be the stage where prescriptions are developed. Once this occurs, the HCP requires that prescriptions be implemented on the ground. How and when such prescriptions are approved by DNR is not relevant, but the on-the-ground protections provided by this process are relevant and thus drive the definition of “conducting Watershed Analysis.”

Text: DSEIS page 4-10: “Unless previously completed, watershed analysis may not be performed in watershed within the newly acquired lands in the near future.”

49. Comment on Watershed Analysis under State Regulations: There is no supporting narrative to support the contention that if the lands are acquired, but the HCP is not extended to the new lands that watershed analysis will not be completed at the same pace as describe for Alternative 1, the No Action alternative. Furthermore, the FSEIS should identify the Watershed Administrative Units in which watershed analysis is currently being undertaken as well as the WAUs in which watershed analysis will likely occur in the future as the result of being high on the DNR priority list. Without a logical narrative to support the DSEIS contention, the impacts to public resources that are mentioned in the DSEIS are speculative.

Services’ Response: The only remaining watershed analysis to be completed in the Planning Area in the Green River Basin is the North Fork of the Upper Green River. Modification of the HCP will neither affect nor delay completion of this watershed analysis. The FSEIS has been corrected to reflect this fact.

Text: DSEIS page 4-11: “However, most non-fish bearing, seasonal streams would not receive the same protection under current FPA regulations.”

50. Comment on State Protection of Nonfish-Bearing Streams: The standard to which the narrative is being compared should be explicitly stated.

Services’ Response: The sentence should read that under State Forest Practices Rules and Regulations, most nonfish-bearing streams would not have buffers required. The regulations referred to are those that were in effect at the time of the initial issuance decision (June 27, 1996) as well as those in effect today.

Text: DSEIS page 4-11: [Alternative 3 (Proposed Action)]. Under the Proposed Alternate, watershed analysis would be conducted on an accelerated basis for all WAUs in the Planning Area in which Plum Creek owns more than 10 percent of the land.

51. Comment on Accelerated Watershed Analysis: This statement is inconsistent with the proposed modifications to the HCP which call for extending the time for Plum Creek to complete watershed analysis for lands from the five years stipulated in the original HCP to a proposed ten years in the amended HCP.

Services' Response: The adjustment to the schedule of analysis is not part of the Proposed Action, but has already been completed as a minor modification. Completion of watershed analyses within the 8-10 year timeframe is still considered to be "an accelerated schedule" when compared to the schedule without an HCP. Analysis is complete and prescriptions are being implemented on 10 of the 20 watersheds.

52. Comment on Watershed Analysis Schedule: Furthermore, while Plum Creek is acquiring considerable acreage, it is not acquiring new Watershed Administrative Units. Watershed analysis is ongoing in two of the WAUs in the Green River basin, the proposed amendments to the HCP would allow Plum Creek to slow any work towards completing the analyses currently underway. Any such action allows for the continued degradation of the riparian and uplands areas that contribute to salmon habitat and habitat forming processes. If the proposed performance of watershed analysis is delayed, then the impacts will be similar to those described for Alternative 2. However, once some impacts such as harvest in the areas that contribute to salmon habitat or habitat forming processes will last for over a century following the impact.

Services' Response: Regarding the Plum Creek lands in that Watershed Administrative Unit (North Fork Green River), extrapolation to adjacent Watershed Administrative Units' prescriptions will be used, where appropriate, to ensure that impacts occurring during the interim are commensurate with those which might have occurred had watershed analysis already been performed. Therefore, the Services believe that the conservation measures of the HCP will continue to comprehensively protect riparian and upland plan areas.

53. Comment on Seasonal Streams: No protection is guaranteed on intermittent (Type 5) streams under the HCP. The proposed amendments also do not guarantee any protection.

Services' Response: The HCP does not change with respect to seasonal or small perennial streams as a result of this modification. However, protection is guaranteed to inner gorges before and after the modification. Also, upland leave tree logistics and watershed analysis constitute additional protection in both scenarios. Some DNR Type 5 streams have perennial surface or subsurface flow and would therefore receive the protections associated with other perennial streams under the HCP. Another consideration is the longer rotations needed to achieve landscape-level commitments. These ensure that fewer small streams will be exposed to the effects of even-aged management during any given time period than would occur without such a commitment. Also see Services' response to Muckleshoot Indian Tribe Comments 1a, 14, 19, and 43.

54. Comment on Watershed Analysis Oversight: The EIS should specify what action the Services will undertake to ensure that the prescriptions that are developed are protective of natural resources. For example, representatives of the Services have attended very few meetings held for watershed analysis prescriptions for the Smay Creek and Howard Hanson Watershed Administrative Units. Furthermore, if members of the Services do attend watershed analysis meetings, the FSEIS should state what limitations, if any, exist upon the ability of the Services to make comments requesting that due to site specific concerns or information generated as a result of watershed analysis, that the interim and default RMAs and other habitat protection measures in the HCP are insufficient and need to be improved.

Services' Response: The Services will rely upon Plum Creek to implement all prescriptions developed under each watershed analysis. The Services will focus on effectiveness monitoring to ensure that each prescription is providing the level of protection expected. The Muckleshoot Indian Tribe's comments raise an interesting point: that, in the event of disagreement about the adequacy of watershed analyses, what mechanisms would be available to resolve such a dispute? The Services believe that the Implementation Agreement provides some guidance in that regard, but we also believe less-formal mechanisms could be used. When the Muckleshoot Indian Tribe contests the conclusions derived during a resource assessment or prescription-drafting process, they should notify the Services. The Services would then call a meeting with Plum Creek and the Tribe's watershed analysis representatives to resolve the dispute. The Services believe that a simple solution may be available to this question and welcomes further input from the Tribe in this regard

55. Comment on Ecological Value of Federal Lands: Throughout the analysis of the benefits of the HCP, it is implicit that blocking the land into distinct ownerships will have ecological benefits, due to the observation that the adverse impacts of non-Federal lands in the Green River checker board reduce the ecological value of the Federal lands. The converse also exists. The current Forest Service lands such as those in the Green River provide large woody debris, trap fine sediment, stabilized coarse sediment and thus provide sites that improve the quality of habitat on the non-federal lands. Under the standard in the HCP, the quantity or quality of these inputs will decline with long term impacts to salmon habitat.

Services' Response: The Services note that this is a matter of degree when Plum Creek will only be adding about 1,400 acres and 7 miles of streams in the watershed which currently contains 110,500 acres and 1,000 miles of streams. The Services do not believe that buffer width is directly related to the quantity and quality of salmonid habitat. Also see Services' response to Muckleshoot Indian Tribe Comment 1a.

Text: DSEIS page 4-13: "The HCP also specifies 100-foot RHAs on perennial streams in watersheds with anadromous fish, bull trout or 303(d) concerns east of the Cascade Crest."

56. Comment on More Protection on East Side: It is unclear why perennial streams with anadromous fish east of the Cascade require more protection than perennial streams west of the Cascades. The FSEIS should clearly specify why chinook salmon of the Puget Sound ESU do not require the same degree of protection as chinook salmon ESUs in the Planning Area east of the Cascade crest.

Services' Response: The Services focused their attention on lands where naturally spawning populations of anadromous salmon are known to occur. The Services also focused more attention where the Federal lands were being managed for the maintenance of spotted owl clusters, which was predominantly the AMA and LSR designations. The largest reason for the difference may be the additional emphasis placed upon the east side to address the issue of water temperature and to protect the bull trout.

Text: DSEIS page 4-14: [Water Quality] Therefore, the environmental consequences under the Proposed Action Alternative would be the same as under the No Action Alternative”

57. Comment on Water Quality: As the Riparian Reserves in effect on the federal land in the Green River are wider than those in the HCP, with most of the Type 4 and 5 streams covered in the HCP lacking riparian buffers, it is unclear how water quality will not be altered by reducing a buffer from over 100 feet to 0 feet in many cases, or from 300 feet to a 30-foot no-cut zone and a 170-foot zone of which 50% of the merchantable volume of the timber can be removed.

Services’ Response: See Services’ response to Muckleshoot Indian Tribe Comment 1a. All fish-bearing streams get 200-foot (measured horizontally) buffers and many perennial nonfish-bearing streams will get 100-foot (measured horizontally) buffers. The removal of 50% of merchantable timber volume was a maximum provided other conditions are met. The other conditions will preclude removal of anywhere near this amount. There are several factors limiting the removal of timber from the 200-foot and 100-foot RHAs. The relative density and quadratic mean diameter requirements that must be met immediately following harvest (RD of 48 and QMD of 10-13 inches on west side) will seldom allow more than 10-15 percent of the volume to be removed. In the vast majority of cases, it will only allow a few trees to be removed from the outermost edge of the buffer. This is also a one-time removal during the life of the Permit. Additionally, the riparian landscape targets must be met with respect to stand structures. As mentioned in other responses, watershed analysis results in the Green River Basin conducted to date indicate that about 56 percent of the remaining perennial nonfish-bearing streams will receive a 50-foot, “no-cut” buffer.

58. Comment on Cursory Water Quality Description: The EIS for the original HCP and the DSEIS have no more than a cursory perusal of water quality, as previously stated. Other environmental documents prepared for lands in the Planning Area above Howard Hanson Dam state the consolidation of Plum Creek lands in the Green River system would increase sediment delivery to streams compared to current conditions.

Services’ Response: The quality of those “other documents” cannot be ascertained without a citation. The Services assume the reference is to the DEIS on the land exchange itself. Preparers of that document were not as familiar with the benefits to be accrued under the HCP as they should have been. The Services do not deny that some amount of sediment increase may occur. However, statements that such results would occur are not warranted.

Text: DSEIS page 4-32: "...anadromous salmonids are less likely to be impacted in the Green River subbasin due to fish passage blockages."

59. Comment on Fish Passage: The Additional Water Storage Project for Howard Hanson Dam on the Green River includes restoration of fish passage through Howard Hanson Dam for both adult and juvenile salmonids. The original HCP and proposed modifications do not consider the probability that naturally spawning chinook will occur in the Green River portion of the Planning Area. The Final Feasibility Report/Final Environmental Impact Statement for Additional Water Storage Project for Howard Hanson Dam states that the "*proposed listing of chinook salmon in Puget Sound by NMFS underscores the potential benefits of extending the range of anadromous species to historic habitats.*" The Additional Water Storage Project intends to address this by extending the range of chinook to their historical habitat.

Services' Response: Until those events occur, the situation remains that naturally spawning anadromous salmonids are unlikely to be impacted as they are unlikely to occur in the Green River Basin. Further, Plum Creek's lands are not situated along primary chinook habitat in the mainstem of the Green River. Indirect effects on upstream habitat have been adequately addressed in the DEIS. Fish habitat protection measures are addressed in the Riparian Management Strategy (see HCP Section 3.3).

Text: DSEIS pages 4-34 through 4-37: Table 7.

60. Comment on Green River Statistics: This Table 7 should be broken down into a westside and eastside component. More than 50% of the land proposed for trade to Plum Creek within the Planning Area is located in the Green River watershed where Plum Creek's management effects will differ from eastside post-exchange effects. The associated east- and west-side effects over the Planning Area need to be clearly identified.

Services' Response: The Services concur and, per previous comments, such a table is included in the Services' response to Muckleshoot Indian Tribe comment 81.

Text: DSEIS page 4-58: Fish and Fish Habitat Alternative 1 - No Action

61. Comment on Riparian Habitat Areas: The description of the 200-foot RHAs is misleading to reviewers not familiar with the HCP. Additional comments on this issue follow.

Services' Response: The 200-foot buffers are measured horizontally. The buffers are measured from the ordinary high water mark on each side of the stream for a combined total of 400 feet. These 200-foot buffers are applied to any stream documented to be fish-bearing. The first 30 feet are a "no-harvest" area, but do allow enhancement activities to be conducted. The remaining 170 feet must meet the minimum definition of spotted owl habitat immediately following harvest. Removal of timber under the HCP is expected to somewhat heavier on the outside of buffers for a "feathered treatment." The 100-foot Riparian Habitat Areas applied to many of the nonfish-bearing perennial streams do not contain a no-harvest zone but instead have a ground-equipment exclusion zone. The Riparian Habitat Areas all share the same standards for post-harvest stand-level characteristics (e.g., in the Green River Basin, these would be a minimum Relative Density of 48, which equates to a canopy closure of about 70 percent; and a minimum Quadratic Mean Diameter of 10 to 13 inches, together these are equivalent to about 280 trees per acre 10 inches in diameter; HCP sections 2.3 and 2.4, pages 55-60) as well as Riparian Landscape-wide Stand Structural Stage targets (HCP Table 30; page 207; e.g., at

year 2045 under the original HCP, RHAs on Plum Creek ownership must be at least 60 percent Mature Forest or better). These buffers are considered minimums as they may be increased as a result of watershed analysis or as a result of aquatic monitoring. Harvests within RHAs are also limited to one entry during the 50-year HCP period.

Text: DSEIS page 4-58: nonfish-bearing streams that contribute significant quantities of water to downstream fish-bearing streams.

62. Comment on Significant Contribution of Water: The FSEIS should define what constitutes “significant” quantities.

Services’ Response: These are the first 2,000 feet upstream of a fish-bearing stream and are only expected to occur when there is no other requirement for a 100-foot RHA on that stream reach.

63. Comment on Wood for Downstream Reaches: It is important to note that nonfish-bearing streams that contribute significant quantities of wood to downstream fish-bearing streams do not typically have a RMA under the current HCP and will not have a RMA under the proposed HCP. The DEIS for the I-90 Land Exchange mentioned the role of Type 4 and Type 5 streams in providing wood to downstream reaches.

Services’ Response: Actually, under the current HCP, perennial, nonfish-bearing streams do “typically” have a Riparian Habitat Area of 100 feet. However, there are perennial nonfish-bearing streams that do not include a Riparian Habitat Area, but instead only receive a 25-foot Riparian Leave Tree Area (equivalent to 44 trees per acre 12 inches and larger in diameter) or in some cases no buffer at all. However, these are relatively few. While they are virtually nonexistent in the Yakima River Basin, the application of buffers of 25 feet or less is also infrequent in the Green River Basin. (See FSEIS Table 28A and tables provided in response to Muckleshoot Indian Tribe Comment 81.)

Text: DSEIS page 4-58:

64. Comment on Fish Passage: The Fish and Fish Habitat section does not include a discussion of the plans underway to allow for Puget Sound ESU chinook salmon to spawn naturally in the Green River portion of the Planning Area. Indeed, a fundamental assumption of the HCP appears to be that parts of the Green River formerly accessible to chinook salmon, but now blocked will remain inaccessible. This viewpoint is reinforced by the statement on page 4-32 that, ..”.anadromous salmonids are less likely to be impacted in the Green River subbasin due to fish passage blockages.”

Services’ Response: The assumption is somewhat true with regard to the original HCP. We did not know if or when passage would be restored, but NMFS Unlisted Species Assessment refers to that possibility. However, it is clear now that there are plans to provide passage into the Green River Basin. The Services do believe that the HCP provides adequately for anadromous fish in the Green River Basin.

Text: DSEIS page 4-59: “Plum Creek’s would also implement prescriptions resulting from watershed analysis, thereby ensuring adequate LWD supplies from riparian corridors and minimizing sediment delivery to stream channels.”

65. Comment on Shortages of Large Woody Debris: Current available habitat in the watershed is considered by the Forest Service to be much reduced and of poorer quality compared to reference conditions of the mid-1800s. It also states there are a lower number of pools, poor quality, lack of adequate cover, lack of riparian vegetation, and low number of stable side channels and limited LWD. Also that stream surveys determined that shortages of LWD was limiting salmon habitat. Given such statements, it is important to define the ambiguous term “adequate” in the FSEIS. The FSEIS should contain sufficient analysis for a reviewer to evaluate this statement.

Services’ Response: Adequate means consisting of, or leading to, properly functioning riparian and upland habitat which provides for natural processes to occur in a manner and rate that results in aquatic habitat conditions which can support a self-sustaining population of aquatic organisms.

Short of adding large woody debris, there are no prescribed activities that will reverse the loss of large woody debris in the Green River Basin that will occur as the result of past lawful practices. Replenishment of in-channel large woody debris will not occur until current riparian stands begin to generate significant amounts of “new” large woody debris. Widening buffers or extending them further into the headwaters will not change this situation. Actions taken today in the HCP are designed to address current and future large woody debris needs for fish habitat.

66. Comment on Large Wood Recruitment from Riparian Habitat Areas: Under the current HCP, for Types 1 through 3 streams, there is a 200 foot riparian habitat area (RHA) or in common parlance a riparian management zone (RMZ). Of this 200 foot RHA, only the 30 feet closest to the stream channel is a no harvest zone. Up to 50% of the merchantable wood can be removed from the remaining 170 feet of the RHA. All of 100 foot RHA of Type 4 streams is open to harvest, with only simple requirements for leaving some trees. The EIS for Plum Creek HCP reads “*by providing at the equivalent of at least one tree height of protection for fish-bearing streams, litter fall and stream shading will be fully maintained, and the 200-foot RHAs are expected to provide, at a minimum, 85% percent, and in most instances, up to 100% of the woody debris inputs that occurred under natural conditions.*” This wording is restricted to the provision of large woody debris from the adjacent riparian corridor and can not be interpreted to mean, as the DSEIS implies, that total large woody debris recruitment potential into the streams as derived from both adjacent, upstream and upslope sources will in most instance equal 100% of natural conditions. The Services are referred to the National Marine Fisheries Service (NMFS) response to the State of Oregon Coastal Coho Plan for a detailed discussion of this issue.

Services’ Response: The commentor is correct that estimates of 100 percent of the natural large woody debris recruitment refers to the recruitment from the adjacent riparian corridor. The Commentor refers to “only simple requirements for leaving some trees.” In actuality, there are a number of constraints including HCP-wide landscape-level amounts of old growth, mature forest, and other structural stages; Riparian Habitat Area wide landscape-level amounts of old growth, mature forest, and other structural stages; and post-harvest stand-level requirements for owl habitat. On the west side of the Cascade Crest, stand-level requirements would mean that between 175 to 280 trees per acre would need to be left post-harvest with a minimum quadratic mean diameter of 10 to 13 inches. This same standard applies to both 100-foot and 200-foot RHAs.

In a basin-wide context, stream-adjacent sources of large woody debris are the principal source of large woody debris inputs. These areas contribute all or virtually all “key pieces” (e.g., full tree with attached root wad), the great majority of functional (e.g., see Bilby and Ward 1989) pieces. Some of the large woody debris inputs from mass wasting may contribute substantial large woody debris locally, but for the watershed as a whole and over time, these sources would be secondary to stream-adjacent inputs. The HCP considers both large woody debris sources to be important for maintenance of aquatic habitat and water quality, and has provided for their protection. Additional protection is provided via watershed analysis for both fish-bearing and nonfish-bearing streams. The best example of added protection for fish-bearing streams is the no-harvest prescription for the areas within channel migration zones. Where these occur, watershed analysis buffers begin at their outer edge. In some areas, such as along the mainstem of the Green River, the resulting no-harvest buffers may exceed 300 feet in width. See also Services’ response to Muckleshoot Indian Tribe Comment 1a for examples of watershed analysis protection for nonfish-bearing streams and responses to Muckleshoot Indian Comments 57 and 61 for standards of RHA.

67. **Comment on Instream Habitat Quality:** Furthermore, as large woody debris loadings in streams have been observed to decline for 100 years following timber harvest, given the time frame during which much of the harvest occurred above Howard Hanson Dam, it is probable that instream habitat quality will continue to decline for a further 50 to 100 years, before natural processes can begin to reverse the decline in large woody debris. The FSEIS should clarify if this issue was considered in the development of the HCP and the calculation of original authorized take.

Services’ Response: *The Services considered that large wood is important for instream characteristics of anadromous fish habitat. In the Fish and Wildlife Service’s Unlisted Species Assessment, we stated that “The HCP will retain standing and downed trees for recruitment of large woody debris in riparian areas, providing for a continuous source of LWD. Increases in LWD due to RHAs will create deeper pools for returning adults and summer rearing juveniles, more hiding cover for juveniles, more habitat complexity for winter rearing juveniles, nutrient input, will function to store excess sediment, and will minimize effects to downstream fish-bearing waters. To date, assessments regarding the relation of large wood supply to “take” of salmonids in this HCP has been restricted to the east side of the Cascade Crest. A detailed discussion on this topic is contained in the July 13, 1998, Biological Opinion and supporting documentation with regard to the addition of Columbia River bull trout to this HCP.*

In the July 13, 1998, Biological Opinion, the Fish and Wildlife Service states, with respect to cumulative effects, the Service considered that there is “still a concern that habitat loss is occurring from latent, chronic sedimentation of streams from old roads and from previously harvested riparian leave areas which provide inadequate amounts of large woody debris and shading. Regrown riparian stands often begin to contribute “functional” wood within 40 years after harvest, but at an insufficient rate to offset decomposition and loss. Recovery of large wood requires regrowth of stream-side trees to sizes functional in the channel (key piece size) and recruitment of these trees into the channel. This is a long-term process (100-600 years), due to the time required for trees to become established, grow, and be recruited into the channel.” It is clear from this statement that not only did we consider the impacts described by the Muckleshoot Indian Tribe, but that we, the Tribe, and Plum Creek do not disagree on the current state of the situation including the inevitable short-term decline in in-stream woody debris; albeit we all may have our own opinions as to how the situation can best be addressed.

In the NMFS unlisted species assessment, on page 9, they provided background regarding the Green River which states ..".recent stream surveys have indicated low pool frequency, pool quality, lack of adequate cover, a general lack of riparian vegetation, and a low number of stable side channels. These conditions have created unstable conditions for successful anadromous fish reproduction -- including redd scour even during moderate flow events." This language indicates that these issues were considered by NMFS in the evaluation of the HCP. On page 14, NMFS states that "Activities that will occur in the HCP area that may result in take (if anadromous species were listed) may include 'harm" through adverse changes in essential habitat features such as increased peak flows due to upslope harvesting, reduced LWD [large woody debris] input due to harvest of riparian trees in some type 5 channels (and type 4 channels on the west side), and additional sediment....." Thus, it appears clear that NMFS did consider these potential impacts in their assessment of "take."

- 68. Comment on Continued Large Woody Debris Declines:** Another document prepared by the United States Forest Services cites one study that states LWD would decline to approximately 50% of the pre-harvest levels before significant inputs of LWD from re-growth in the riparian zone. The initial new recruitment would not be sufficient in quantity to compensate for the losses. It also notes that if a second riparian harvest occurred, instream LWD levels would be expected to decline even further over time to a point where instream LWD would be minimal to non-existent.

Services' Response: The Services recognize that large woody debris recruitment will take a long time to restore. First, many degraded riparian corridors must improve by growing smaller trees into large trees. Then, those trees must be recruited into the streams through natural processes which whether continuous or sporadic or episodic take time to occur. The Services note that we have had these discussions with both Plum Creek and the Tribes, and there is little scientific disagreement on the basic principles.

- 69. Comment on Rate of Decline of Large Woody Debris:** Given such observations regarding LWD, the FSEIS should clearly discuss the rational by which a proposal that allows for reducing the quantity of LWD entering a system that is losing LWD will restore or maintain the quality of habitat, when other analyses suggest it would merely slowing its the rate of decline.

Services' Response: The Services do not believe that the proposed action will significantly affect the amount and rate at which large wood will be recruited in the Green River Basin. Some small affect is likely, but is impossible to estimate at this time. However, these are the types of actions to which the incidental take permit applies.

Text: DSEIS page 4-59: “The Proposed Action Alternative is similar to the No Action Alternative in regard to riparian protection for fish and fish habitat.

70. **Comment on Changing Buffers:** It is unclear how changing from 100 to 200 foot buffers, to buffers of 0 to 200 feet, is similar protection.

Services’ Response: Riparian protections that will be provided to Plum Creek’s lands under the Proposed Action Alternative and the No Action Alternative are similar. Both alternatives would implement the Riparian Management Strategy discussed in detail in the HCP (Section 3.3), in the HCP DEIS (Section 2.3.3); in the HCP FEIS (pages A-39 through A-47); and in the Anadromous Salmonid Unlisted Species Analysis and Findings (Section 5.0). The Services meant to state in the DSEIS that the actions would remain **similar on the respective lands**. In the following sentence in the DSEIS, the Services stated ..” Plum Creek and the Forest Service would utilize similar, but different, strategies for...” Our intent was to indicate that there are different ways to provide similar levels of conservation.

71. **Comment on Downstream Large Woody Debris:** Additionally, the standards in the HCP implicitly overlook the important contribution of wood delivered from small streams to downstream fish bearing waters by a failure to ensure buffers are of sufficient width to retain historical wood input in terms of size and temporal distribution.

Services’ Response: See above responses related to large woody debris recruitment.

72. **Comment on Specifying Action by DNR Stream Type for Comparisons:** If the FSEIS argues that issues of mass wasting, surface erosion, slope stability and the like will lead to buffers on nonfish-bearing streams that are comparable in ability to those under the Aquatic Conservation Strategy to deliver large woody debris to streams in terms of size, width, and temporal frequency. Rather than rely upon an untested assumption, the FSEIS should specify by DNR stream type and by WAU, the length of riparian buffer that will not be harvested and/or thinned due to protections afforded them through mass wasting or other watershed analysis prescriptions.

Services’ Response: See Services’ response to Muckleshoot Indian Tribe Comment 1a. It is impossible to identify what length of riparian buffer will remain unharvested and/or thinned by DNR stream Type since the HCP is based upon, above all else, the presence of fish in the stream. As the Muckleshoot Indian Tribe stated in previous comments, it is not appropriate to use DNR stream types to estimate the amount of fish-bearing streams as fish-bearing, and perennial nonfish-bearing streams continue to be discovered through watershed analysis and direct field verification.

73. **Comment on Watershed Administrative Unit Level for Analyses:** These analyses (specification of what length of each stream type will be not harvested and/or thinned due to protections afforded them through mass-wasting or other watershed analysis prescriptions) needs to be undertaken at the WAU level, because that is the operational unit at which the Plum Creek and the Services have agreed that resource assessment should be undertaken to implement the HCP on the ground for fish and fish habitat.

Services’ Response: The Services are not aware of any agreement between Plum Creek and the Services regarding the operational unit for resource assessment. Rather, the Services focus most on the operational unit for ESA listings and de-listings. For anadromous fish this is generally a distinct population segment (Fish and Wildlife Service) or ESU (NMFS).

Text: DSEIS page 4-60: “The Services believe that Plum Creek’s HCP increases the amount of protection to resource of concern to Tribes when compared to proceeding under State Forest Practice Rules and Regulations.”

74. Comment on Comparison to State Rules rather than NWFP: In most cases, this is a true statement. However, the FSEIS should also state if the HCP increases the amount of protection to resources of concern to Tribes compared to the Aquatic Conservation Strategy which applied to the Forest Services lands proposed for trade to Plum Creek. Compared to typical management on private land, the HCP is an improvement, compared to the protections the lands still have, pending finalization of the land exchange, the HCP is considerably less protective.

Services’ Response: The Services agree that the HCP provides no more protection than was available to the subject lands under the NWFP. Whether the difference in management results in any substantial decreases in protection is debatable. Clearly, the NWFP does involve a slightly lower level of risk than the HCP presents.

Regardless of the HCP modifications, State Forest Practices Rules and Regulations provide protection for certain cultural resources found on Plum Creek land. The proposed HCP modification will have no effect on historic and cultural properties, but it may have incidental benefits for cultural resources found on Plum Creek land. The proposed HCP modifications will add additional wildlife conservation conditions to lands newly obtained by Plum Creek through exchange, and those additional conservation measures may provide incidental protection for cultural resources through limiting ground-disturbing land uses for wildlife purposes. Although additional wildlife conservation measures and incidental cultural resource benefits may exist on Federal lands before they are exchanged to Plum Creek, the adverse effects of the exchange are taken into account before lands are transferred to Plum Creek and subject to management under the HCP modifications.

Text: DSEIS page 4-60: “The Services intend to ensure the involvement of the affected Tribes in the continued implementation of the HCP.”

75. Comment on Involvement of Services in Watershed Analysis: The FSEIS should indicate the extent of the Service’s involvement to date in implementing the HCP, through the number of resource assessment and prescription meetings by WAUs that service staff have attended. The Services have laid great reliance upon watershed analysis, yet are typically absent from the meetings.

Services’ Response: The Services involvement to date in implementing this HCP has focused on a variety of facets other than watershed analysis. We are actively tracking this HCP and, in fact, are reviewing each harvest unit prior to harvest by Plum Creek. The level of involvement by the Services in the watershed analysis process reflects several factors: (1) The lack of reliance placed upon watershed analysis as opposed to HCP measures; (2) The presence of the Tribes such as the Muckleshoot Indian Tribe at such meetings representing the same interests with as good or better technical staff; (3) The previous experiences with watershed analysis in the HCP planning area with Plum Creek through the Lester WAU; and (4) The sense, which has also been stated by the Muckleshoot Indian Tribe on numerous occasions, that Plum Creek is doing a good job of conducting watershed analysis and of implementing the prescriptions.

On a number of occasions, the Tribe has made the points, however, that not every timber company is following through so conscientiously and that the Services should not rely on Company performance or the performance of Washington State DNR in the process. The Services concur and realize they are fortunate in this watershed/planning area in that regard.

Text: DSEIS page 4-60: “Tribal participation is explicitly guaranteed by Plum Creek’s HCP.”

76. Comment on Tribal Participation in Watershed Analysis: Tribal participation in watershed analysis is guaranteed by the Washington State Forest Practice Rules. The federal guarantees in the FEIS for the original HCP granted nothing that the Tribe did not already have.

Services’ Response: The change to the HCP that guaranteed Tribal participation was made in response to comments received by the Muckleshoot Indian Tribe. The HCP requirement should be viewed as additional protections of that involvement as well as strong statement about the value of Tribal involvement.

Text: DSEIS page 4-63: Cumulative Impacts

77. Comment on Cumulative Impacts: The DSEIS has failed to adequately consider this federal action, in context of past, ongoing, and probable future federal actions, particularly in regard to land exchanges, Additional Water Storage Project, and other Habitat Conservation Plans that will influence habitat forming processes for a minimum of 50 years. By not analytically considering all actions that will influence the quality and quantity of habitat above Howard Hanson Dam, the Services has failed to consider the specific and cumulative impacts of such federal actions upon the ability of the basin above Howard Hanson Dam to support salmonids.

Services’ Response: The Services note that the DSEIS did not contain an analysis of the future foreseeable actions mentioned in the Muckleshoot Indian Tribe comments, and will incorporate those into the FSEIS. However, as the Tribe has noted, the net result of these actions appears to be positive with respect to Green River salmonids and, the Services note that, as such, the DSEIS represented a worst-case scenario.

Text: DSEIS page 4-63: “Habitat for sensitive life stages of anadromous salmonids will be increased by the measures identified in this HCP. (NMFS Unlisted Species Analysis, June 25, 1996).”

78. Comment on Unlisted Species Analysis: This Unlisted Species Analysis should be included in the FSEIS so that all reviewers will have access to some of the underlying documents used to support amending the HCP.

Services’ Response: The Services’ Decision and Execution documents for the original HCP are quite voluminous. Additional documentation, which form the foundation of the science used in the HCP, is comprised of 13 technical reports. The Service has mailed to Muckleshoot Indian Tribal staff copies of the decision and execution documents for both the original HCP as well as the addition of Columbia River Bull Trout. We incorporate those documents herein by reference. Documents prepared by the Services are available upon request; documents prepared by Plum Creek can be obtained in a number of western Washington Libraries or by contacting Plum Creek directly.

79. Comment on Proposed Listing of Chinook Salmon: Additionally, the utility of this document towards the proposed amendments of the HCP should be re-evaluated in context of the proposed listing of chinook salmon, (which described a Puget Sound ESU, distinct from the ESU east of the Cascade Crest), the NMFS comments to the State of Oregon Coastal Coho Plan, the riparian and mass wasting sections of the Cedar River Watershed Habitat Conservation Plan (which discusses the importance of LWD recruitment from small streams to downstream reaches), and information collected by the Muckleshoot Indian Tribe for the ongoing Watershed Analyses in the Green, White and Clearwater Rivers.

Services' Response: Regarding NMFS' Oregon Proposals, see response to Muckleshoot Indian Tribe comment #88 for more detail. The Services note that the Draft Proposal Concerning Oregon Forest Practices was submitted by NMFS to the Oregon Board of Forestry Memorandum of Agreement Advisory Committee and the Office of the Governor on February 20, 1998. This was a draft framework proposal for discussion purposes. It was a starting position for negotiation. There was scientific disagreement among the scientists consulted by NMFS in the process of developing their proposal. As would be expected in a negotiation environment, NMFS's proposal represents the more-conservative approach. The proposal states that the prescriptions for intermittent streams are interim proposals until watershed analysis (according to Washington DNR Watershed Analysis) is completed. It also recognizes that prescriptions need to be developed in the context of species information and that land managers need to design conservation that fits the ground as well as the needs of the land manager.

In this regard, the Services believe that the Plum Creek HCP meets the intent of the NMFS proposal. See Muckleshoot Indian Tribe comment #88.

The NMFS assesses any conservation plan for watershed and riparian function by examination of the substance of proposed conservation measures, and the thoroughness of the process used to derive those conservation measures. The NMFS approved the original Plum Creek HCP based in part on the watershed analyses and associated prescriptions. This analysis procedure and resulting prescriptions were believed by NMFS to adequately protect habitats and watershed health necessary for long-term survival of Federally protected stocks of anadromous fish in the Planning Area. The proposed land exchange, and associated modification of the HCP, does not contain anything that would lead NMFS to alter that determination. Nevertheless, there may be opportunities to improve assurance of riparian function by identifying specific reaches of small streams suitable for enhanced protection by Plum Creek. It is expected that watershed information collected by the Muckleshoot Indian Tribe could aid that effort

80. Comment on Potential Large Woody Debris Recruitment: The prescriptions proposed by the Muckleshoot Indian Tribe for the Clearwater and Middle White River Watershed Administrative Units, copies of which were forwarded to the NMFS, contain a detailed discussion of potential large woody debris recruitment, as well as problems with how the literature is being used to support contentions, such as those in the HCP, that buffers significantly narrower and less dense than historical buffers will not jeopardize chinook salmon.

Services' Response: The Services note no noticeable differences in interpretation of the science regarding large woody debris recruitment and its function in streams with regard to comments submitted by the Muckleshoot Indian Tribe and the understanding of these principles by the Services technical staff. The Service believes our application of these concepts in specific cases, such as HCPs, is consistent with the literature. However, we also believe that our objectives and understanding of what has been achieved with these HCPs may not have been communicated as clearly as it could have

been. Therefore, the Services look forward to future discussions with the Muckleshoot Indian Tribe and their technical staff so that communications in both directions can be enhanced.

Please also see response to Muckleshoot Indian Tribe comment #79. While most of the referenced comments were not specifically made with respect to the proposed action, we believe these issues have been fully addressed through the accumulation of responses to previous comments on large woody debris and how the Services considered large woody debris recruitment.

C.II COMMENTS ON DRAFT DESCRIPTION AND ANALYSIS OF MODIFICATIONS TO PLUM CREEK TIMBER COMPANY'S CASCADE HABITAT CONSERVATION PLAN

Text: See Tables A, C, D, 2A, 4A, 22A, 24A, 26A, 26B, 27A, 28A, 30A, and 30B.

81. Comment on Green River Statistics: None of the listed tables report data pertinent to an analysis of impacts to salmonid habitat for Puget Sound ESU chinook, or salmon of any other ESU found in the Green River basin. With respect to salmonid habitat in the Green River basin, the Services should specifically explain in the FSEIS how they used the data in the listed tables to support their conclusion that “[h]abitat conditions...for both resident and anadromous fish in the Planning Area would be maintained or improved under the Proposed Action Alternative” (DSEIS p. 4-59).

Services' Response: We used the data in the listed tables to support our conclusion that habitat condition trends would be maintained or improved under the Proposed Action Alternative. We do anticipate short-term declines in instream large woody debris regardless of alternative selected. We do not believe these actions will significantly aggravate those trends, but instead represent significant improvements in the long-term situation than what would have occurred without an HCP or if the acquired lands were not added to the HCP covered lands.

We also used the following information to analyze each alternative for potential impacts to salmonid habitat in the Green River Basin:

Riparian Management Strategy (HCP, Sections 3.3 and 5.4.3.3; DEIS Section 2.3.3)

Watershed Analysis (HCP, Section 3.3.2; DEIS Section 2.3.3.2)

Riparian Habitat Protection (HCP, Section 3.3.3; DEIS Section 2.3.3.1)

Interim and Minimum Guidelines for Riparian Habitat Areas (HCP, Section 3.3.3.1)

RHA Design and Fish Habitat Protection (HCP, Section 3.3.3.2)

Harvest Deferrals for 303(d) Stream Segments and Wetland Management Zones (HCP, Section 3.3.4; DEIS Section 2.5.1)

Aquatic Resources Monitoring (HCP, Sections 3.3.5 and 5.1.6; DEIS Section 2.3.3.3 and 2.7.6)

Adaptive Management (HCP, Section 5.4; DEIS Section 2.9)

Regarding Tables requested in the above Comment and in Muckleshoot Indian Tribe comment 8, the Services note that reproducing each of the Tables is not practical or useful. Instead the Services have focused on meeting the intent of the comment as we understand it and providing as much useful information for assessing Green River impacts.

Table 1: The ownership information will be provided following this response.

Table 3: This table displays summary information regarding stand structure amounts. This table is not reproduced herein for the Green River Basin as more specific information will be provided in the Green River Table 30A.

Table 4: The owl habitat information will be provided following this response.

Table 5: Owl habitat on Plum Creek ownership alone is not as relevant for impact analyses as the basin-wide information which will be provided in the revised table 4. Also, ownership information would not be useful from a commitment standpoint as the commitments are Planning Area wide.

Table 6: Murrelet habitat information is already only for the west-side of the Cascade Crest. Most of the Plum Creek suitable habitat is in the Green River Watershed.

Table 7: The lifeform information is primarily a function of stand-structure amounts presented in Table 30A. Also see the response for Table 26A below.

Table A: This ownership information is redundant with Table 1. Ownership information for the Green River Basin will be provided following this response.

Tables C, D, and 26B: These Tables are not part of the EIS impact analysis. Rather, they display the stability or change in numbers as a result of shift from management units, 1994 inventory data, and FIBRPLAN to the improved inventory polygons, 1997 inventory data, and Windows-based programming of OPTIONS. Comparison of numbers for the Green River alone would not add any additional information.

Table 2A: Designated Conservation Areas are specific to provincial areas. The first 2 DCAs discussed are west-side DCAs and are labeled as Western Washington Cascades. These generally correlate to the conditions in the Green River watershed.

Table 4A: See response to Table 1 regarding ownership information. However, information regarding the assumed management of Federal lands and assumed inclusion in particular designations will be presented following this response.

Table 22A: The number of owl sites that were prioritized for harvest deferrals is presented following this response.

Table 24A: Stand structures presented in this table are an abbreviated form of Table 30A, while owl habitat has already been presented in revised form as a result of Table 4.

Table 26A: This table is primarily a function of the amounts of habitat provided in Table 30A. However, information regarding lifeform 5 (which includes edge areas as suitable habitat) is provided following this response.

Tables 27A, 28A, and 30A: The revised information is provided below.

Table 30Ab: This table is essentially divided by west and east sides already. Douglas-fir/western hemlock and Noble fir/silver fir occur primarily on the west side of the Cascades Crest while other Forest Zones are primarily found on the east side.

GREEN RIVER TABLES**Green River Spotted Owl Deferrals**

Pre-LEX						
No. of NRF deferrals	NRF Acres	No. of FD corridors	FD Acres	Total No. of deferrals	Total deferral acres	Total No. of owl sites supported
6	474	6	750	12	1224	11
Post-LEX						
No. of NRF deferrals	NRF Acres	No. of FD corridors	FD Acres	Total No. of deferrals	Total deferral acres	Total No. of owl sites supported
4	233	6	837	10	1070	8

Green River Watershed Ownership and NWFP Designation in the HCP (Tables 1A & 4A).

		<u>Ownership</u>	
		Pre-LEX	Post-LEX
PCTC		50,739	52,121
USFS		34,415	33,033
Other		25,329	25,329
Grand Total		110,483	110,483

		<u>NWFP Designations</u>	
		Pre-LEX	Post-LEX
USFS	LSR ¹	4,669	2,377
	AMA	11,790	9,951
	MATRIX ²	16,077	18,941
	Other	1,878	1,763
	Grand Total	34,415	33,033
PCTC	LSR	2,161	4,453
	AMA	10,458	12,297
	MATRIX	21,182	18,318
	Other ³	16,938	17,053
	Grand Total	50,739	52,121

Green River Spotted Owl Habitat Percentages by Decade (Table 24A).

	<u>TOTAL HCP — Pre Land Exchange</u>						<u>TOTAL HCP — Post Land Exchange</u>					
	1996	2006	2016	2026	2036	2045	1996	2006	2016	2026	2036	2045
NRF	23	22	23	23	23	23	23	21	20	21	21	20
FD	21	15	13	14	21	24	21	16	12	14	19	20
Total	44	37	36	37	44	47	44	37	32	35	40	40

NRF = Nesting, Roosting, and Foraging

FD = Foraging and Dispersal

¹ Also includes lands which are, or are interspersed with, Administratively Withdrawn and Congressionally Withdrawn Lands.

² The Kelly Butte Special Management Area covers 4,855 acres of Matrix. In practice, these acres will be managed as AMA and LSR.

³ Other includes Plum Creek lands which are not interspersed with Federal lands and are also referred to as “undesignated” Plum Creek lands.

Green River Stand Structures Percentages by Decade (Table 30A)

	<u>HCP</u>											
	<u>TOTAL HCP - Pre Land Exchange</u>						<u>TOTAL HCP - Post Land Exchange</u>					
	1996	2006	2016	2026	2036	2045	1996	2006	2016	2026	2036	2045
Non-Habitat	6	6	6	6	6	6	6	6	6	6	6	6
Stand Initiation	11	6	2	1	1	2	11	7	3	1	2	3
Shrub/Sapling	5	11	4	5	3	5	5	10	10	5	3	5
Young Forest	24	28	26	13	11	7	24	28	23	19	13	10
Pole Timber	6	8	22	26	24	17	6	8	22	23	26	21
Dispersal Forest	21	13	10	18	23	25	21	14	10	18	22	22
Mature Forest	20	21	23	23	24	29	20	21	21	22	22	27
Managed Old Growth	0	0	0	1	1	2	0	0	0	1	1	1
Old Growth	7	7	7	7	7	7	7	6	5	5	5	5
Total	100	100	100	100	100	100	100	100	100	100	100	100

	<u>RHAs</u>											
	<u>TOTAL HCP - Pre Land Exchange</u>						<u>TOTAL HCP - Post Land Exchange</u>					
	1996	2006	2016	2026	2036	2045	1996	2006	2016	2026	2036	2045
Non-Habitat	9	9	9	9	9	9	9	9	9	9	9	9
Stand Initiation	7	6	0	0	0	0	7	6	0	0	0	0
Shrub/Sapling	1	1	3	0	0	0	1	1	3	0	0	0
Young Forest	12	9	7	8	5	3	12	10	7	9	6	3
Pole Timber	5	7	11	6	6	8	5	7	11	7	6	8
Dispersal Forest	20	14	11	14	15	11	22	16	13	14	17	13
Mature Forest	27	35	40	43	45	47	26	35	41	43	45	47
Managed Old Growth	1	1	1	2	2	4	1	1	1	2	2	3
Old Growth	18	18	18	18	18	18	15	15	15	15	15	15
Total	100	100	100	100	100	100	98	100	100	99	100	98

	<u>TALUS</u>											
	<u>TOTAL HCP - Pre Land Exchange</u>						<u>TOTAL HCP - Post Land Exchange</u>					
	1996	2006	2016	2026	2036	2045	1996	2006	2016	2026	2036	2045
Non-Habitat	15	15	15	15	15	15	15	15	15	15	15	15
Stand Initiation	5	5	1	0	1	3	5	5	1	0	0	1
Shrub/Sapling	1	30	0	0	3	1	1	23	8	1	0	0
Young Forest	4	4	36	7	4	7	4	4	29	16	4	7
Pole Timber	4	2	3	34	35	5	4	4	0	23	27	13
Dispersal Forest	44	21	15	6	3	35	45	27	18	6	12	27
Mature Forest	27	22	29	37	38	31	26	21	28	38	41	34
Managed Old Growth	0	1	1	1	1	3	0	1	1	1	1	3
Old Growth	0	0	0	0	0	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100	100	100	100

Green River Lifeform Habitat Percentages by Decade (Table 26A)

	<u>TOTAL HCP — Pre Land Exchange</u>						<u>TOTAL HCP — Post Land Exchange</u>					
	1996	2006	2016	2026	2036	2045	1996	2006	2016	2026	2036	2045
Lifeform 2												
Primary	66	68	70	77	80	80	64	67	70	74	79	78
Suitable	79	80	81	84	86	86	77	79	81	82	85	84
Lifeform 3												
Primary	66	68	70	77	80	80	64	67	70	74	79	78
Suitable	79	80	81	84	86	86	77	79	81	82	85	84
Lifeform 4												
Primary	75	46	48	78	77	74	75	53	47	68	81	77
Suitable	80	66	67	82	81	80	80	69	66	77	83	81
Lifeform 5												
Primary	78	79	74	70	65	59	78	79	75	71	66	60
Lifeform 6												
Primary	20	16	10	8	5	3	20	17	10	9	6	3
Suitable	56	54	51	50	48	47	55	54	51	50	49	46
Lifeform 7												
Primary	38	31	32	28	26	22	40	34	34	30	29	24
Suitable	65	61	62	60	59	57	65	63	63	60	60	57
Lifeform 8												
Primary	35	47	52	44	38	29	35	46	55	47	42	36
Suitable	59	68	72	69	66	61	59	67	73	70	67	64
Lifeform 9												
Primary	37	30	29	28	26	22	39	33	31	30	29	24
Suitable	60	57	59	60	59	57	60	59	60	60	60	57
Lifeform 10												
Primary	54	49	62	75	79	80	54	49	58	69	76	76
Suitable	69	69	77	84	86	86	69	68	75	81	84	84
Lifeform 11												
Primary	54	49	62	75	79	80	54	49	58	69	76	76
Suitable	74	72	78	85	87	87	74	72	76	82	85	85
Lifeform 12												
Primary	66	68	70	77	80	80	64	67	70	74	79	78
Suitable	69	72	76	80	83	84	67	71	76	78	82	82
Lifeform 13												
Primary	48	41	40	49	55	63	48	41	36	46	50	55
Suitable	63	59	64	69	73	75	63	59	59	67	70	71
Lifeform 13a												
Primary	27	28	30	31	32	38	27	27	26	28	28	33
Suitable	38	43	59	60	61	63	38	43	54	58	59	60
Lifeform 14												
Primary	48	41	40	49	55	63	48	41	36	46	50	55
Suitable	71	68	67	72	75	79	71	68	65	70	72	75
Lifeform 14a												
Primary	27	28	30	31	32	38	27	27	26	28	28	33
Suitable	38	35	35	40	44	51	38	34	31	37	39	44
Lifeform 15												
Young-Aged	40	45	32	19	15	14	40	45	36	25	18	18
Mid-Aged	27	21	32	44	47	42	27	22	32	41	48	43
Late-Aged	27	28	30	31	32	38	27	27	26	28	28	33
Lifeform 16												
Primary	66	68	70	77	80	80	64	67	70	74	79	78
Suitable	79	80	81	84	86	86	77	79	81	82	85	84

Plum Creek Miles of Streams in the Green River Drainage by Northwest Forest Plan Category (Table 27).

<u>Pre-Land Exchange</u>					
DNR Stream Type	AMA	LSR	Matrix	Not Designated	Total
1-3	10	1	15	12	38
4	19	1	28	30	78
5	45	8	95	66	214
9	36	4	47	64	150
Grand Total	109	14	185	172	480
<u>Post-Land Exchange</u>					
DNR Stream Type	AMA	LSR	Matrix	Not Designated	Total
1-3	10	1	11	12	35
4	21	7	26	30	84
5	51	19	82	66	217
9	38	7	40	64	150
Grand Total	119	34	159	172	486

Green River Watershed Approximate Stream Miles by Owner and Buffer Type (Table 28).

Pre-LEX												
Stream Type	USFS			PCTC					OTHER			Total HCP
	300' RCA	150' RCA	Sub-Total	200' RHA	100' RHA	25' RLTA	No Buffer	Sub-Total	Std. RMZ	No Buffer	Sub-Total	
1	1		1	6				6	25		25	32
2	2		2	3				3				5
3	14		14	29				29	16		16	59
4		61	61		20	58		78	44		44	183
5		140	140				214	214		92	92	447
9		77	77				150	150		49	49	276
<i>Total</i>	<i>17</i>	<i>278</i>	<i>296</i>	<i>38</i>	<i>20</i>	<i>58</i>	<i>365</i>	<i>480</i>	<i>85</i>	<i>141</i>	<i>226</i>	<i>1,002</i>

Post-LEX												
Stream Type	USFS			PCTC					OTHER			Total HCP
	300' RCA	150' RCA	Sub-Total	200' RHA	100' RHA	25' RLTA	No Buffer	Sub-Total	Std. RMZ	No Buffer	Sub-Total	
1	2		2	6				6	25		25	32
2	2		2	3				3				5
3	17		17	26				26	16		16	59
4		54	54		28	56		84	44		44	182
5		137	137				217	217		92	92	447
9		78	78				150	150		49	49	277
<i>Total</i>	<i>20</i>	<i>269</i>	<i>290</i>	<i>35</i>	<i>28</i>	<i>56</i>	<i>367</i>	<i>486</i>	<i>85</i>	<i>141</i>	<i>226</i>	<i>1,002</i>

Text: Management of the newly acquired lands in accordance with Plum Creek's HCP will not detract from the management goals and objectives on Federal lands within and adjacent to the Planning Area.

82. Comment on Integrity of Objectives: By decreasing the net length and width of riparian buffers considered in the FEIS as managed in accordance with NWFP Riparian Reserves guidelines, management of the newly acquired lands in the Green River basin in accordance with the proposed modification to the HCP will decrease frequency and magnitude of wood supplied to salmonid habitat in the Green River basin, compromising the management goals and objects of both the NWFP and the approved HCP. An environmental document for the I-90 Land Exchange implies that there are no studies to document that the Plum Creek RMAs are able to provide the same level of protection as the Riparian Reserves⁴.

It could be implied from the HCP statement that provision of habitat for salmon located in the Puget Sound and Puget Sound/Strait of Georgia ESUs is not a management objective or goal for Federal lands in the Planning Area. If the Services and other entities of the United States do not intend to manage federal lands above Howard Hanson Dam for the benefit of the Puget Sound salmon ESUs, that should be stated in the proposed amendments to the HCP.

Services' Response: There may be environmental documents which imply that there are no studies to document that the Plum Creek RHAs are able to provide the same level of protection as the Riparian Reserves; however, there are no studies which show that they do not. Common sense indicates that there is a probability associated with this uncertainty. The Services believe the probability is high that the HCP strategy in total will yield comparable results, but has enlisted the assistance of adaptive management to increase the level of certainty. We believe that RHAs and RLTA's will not significantly decrease large wood functions; instead, we view them as substantial increases over state regulations that will provide riparian functions to conserve habitats for at-risk fish species. We acknowledge that the land exchange itself may somewhat decrease the absolute number of large wood pieces produced in what would have otherwise been Riparian Reserves. Also see responses above.

The Services do not believe that management of the newly acquired lands in the Green River Basin in accordance with the proposed modification to the HCP will significantly decrease frequency and magnitude of wood supplied to salmonid habitat in the Green River basin and further, we do not believe such modification will either compromise the management goals and objectives of the NWFP or the approved HCP. The Federal agencies of the United States do intend to manage Federal lands above Howard Hanson Dam, and expect nonfederal lands to be managed, for the benefit of the Puget Sound salmon ESU.

⁴ I-90 Land Exchange Draft Environmental Impact Statement. USDA Forest Service/Plum Creek timber Company L.P.

83. Comment on Cumulative Land Exchanges: See Section 1.3. The Services did not consider the specific effects of the Huckleberry or I-90 land exchanges in either the DEIS or FEIS on the Plum Creek HCP, and in the DSEIS they consider no data pertinent to the net decrease in the supply of wood to salmonid habitat in the Green River basin as a result of the proposed modification to the HCP. Specifically, the net ownership changes in Green River portion of Plum Creek's HCP Planning Area will all detract from the amount of wood supplied to salmonid habitat as analyzed in the DEIS and FEIS for the Plum Creek HCP.

Services' Response: The Services did not consider the specific effects of the Huckleberry or I-90 Land Exchanges in either the DEIS or FEIS on the Plum Creek HCP. We have considered those effects in the DSEIS; indeed, that is the very reason a supplemental EIS was deemed warranted. The Huckleberry Land Exchange most likely resulted in a net decrease in the supply of wood to salmonid habitat in the Green River basin. As a result of the proposed modification to the HCP, the Services do not expect to see similar reductions due to implementation of the HCP and the steps it contains to address that issue.

In addition, Plum Creek is proposing to address potential large wood recruitment areas and/or particularly responsive channels with respect to sediment storage and response to large wood, by establishing interim procedures, which would be developed for specific stream reaches and applied between the time this modification is complete and the time that adaptive changes are made in the riparian strategy as described in the HCP Modification Document.

Text: With implementation of the HCP, the amount of aquatic habitat will not change, but quality habitat and therefore, amount of usable habitat should increase.

84. Comment on Habitat Quantity and Quality: This statement is incorrect for the Green River, which supports chinook of the Puget Sound ESU. There will be a decrease in the volume of large woody debris and the attendant habitat functions over the lifetime of the HCP. No protection is guaranteed on intermittent (Type 5) streams under the HCP⁵.

Services' Response: See Services' response to Muckleshoot Indian Tribe Comment 66. The Services believe that riparian ecosystems, buffer width, buffer treatment, ephemeral/intermittent streams, and streams in inner gorges have all been adequately addressed in the HCP FEIS. In addition, these issues have been addressed in the Intra-Service Biological Opinion, prepared by the Fish and Wildlife Service, in the Anadromous Salmonid Unlisted Species Analysis and Findings for the Plum Creek Timber Company's Habitat Conservation Plan and Unlisted Species Assessment, prepared by the National Marine Fisheries Service, and in the Record-of-Decision.

The Riparian Habitat Areas (RHAs) being implemented by Plum Creek were designed to provide sufficient quantities of large woody debris, shading, nutrient input, and bank stability to protect and maintain aquatic habitat for fish and riparian dependent wildlife. The RHAs apply to all fish-bearing streams and to perennial, nonfish-bearing streams with the greatest potential to influence habitat in fish-bearing waters. The RHAs provide protection similar to that provided by the NWFP's Aquatic Conservation Strategy buffers for Type 1-3 and most Type 4 streams. The Services believe that the RHAs meet the riparian functions necessary for healthy fish habitat, and Plum Creek's riparian strategy supplements the more-conservative Riparian Reserves on Federal lands. It is also important

⁵ I-90 Land Exchange Draft Environmental Impact Statement. USDA Forest Service/Plum Creek timber Company L.P.

to note that the riparian widths described in the HCP are not only interim, but also minimum widths measured as horizontal distance instead of slope distance as under the NWFP. Therefore, all buffer widths prescribed in the HCP could be increased depending upon the findings and prescriptions developed through watershed analysis.

It should be noted that when the FEMAT team was developing its recommendations for the Aquatic Conservation Strategy, they established the first site-potential tree height for fish, but the second site-potential tree height was established for wildlife purposes. This approach is also consistent with the logic behind the wide buffers placed on fish-bearing streams in Plum Creek's HCP.

Ephemeral/intermittent streams are directly addressed through HCP "Leave Tree" requirements and watershed analysis. As described in the HCP, Plum Creek would often clump leave trees adjacent to intermittent streams. Watershed analysis would identify streams with the potential for erosion. These streams would typically have riparian buffers (ranging from 30 to 100+ feet) and harvesting and road construction would be prohibited. The results of watershed analysis and Plum Creek's aquatic monitoring strategy will provide a feedback loop that can modify prescriptions of the HCP. This is an especially important feature of the HCP's riparian strategy, since it will allow Plum Creek to determine appropriate riparian habitat protection for ephemeral/intermittent streams. Thus, if the results of either process indicate a more-conservative approach to riparian management is warranted, the new information will be used and new management prescriptions will be implemented. Because these elements form the basis of adaptive management in the HCP, the incorporation of new information and the ability to modify the riparian management strategy is assured. This flexibility is key to ensuring the HCP will improve conditions in the HCP Planning Area. The conservation measures identified in the HCP will increase the quality and quantity of spawning and rearing habitat in the HCP Planning Area, and result in a net benefit to salmonids.

One of the greatest concerns many reviewers have is the reduction in riparian buffer width on small, ephemeral/intermittent streams and the perceived reduction in riparian function and fish habitat protection. Watershed analyses conducted in the Lester Creek, Upper Green/Sunday Creek, and Howard Hanson/Smay Creek WAUs have all prescribed increased protection for ephemeral/intermittent streams. For example,

- 1. Many streams in these watersheds previously mapped as nonfish-bearing, are in fact, fish-bearing. As such, these streams now receive wider buffers;*
- 2. Many streams in these watersheds previously mapped as seasonal, are in fact, perennial. As such, these streams now receive wider buffers;*
- 3. Perennial and seasonal streams in the Green River Basin that do not receive buffers through prescriptions in Plum Creek's HCP are receiving buffers directly through implementation of prescriptions developed during watershed analysis; and*
- 4. Perennial and seasonal streams in the Green River Basin that do not receive buffers through prescriptions developed from watershed analysis are receiving buffers indirectly through implementation of prescriptions in watershed analysis or other HCP measures. This includes prescriptions for Mass Wasting, which require mandatory and minimum 50 foot "no-touch"*

buffers on high hazard, Mass Wasting Mapping Units (MWMUs) in, for example, the Upper Green/Sunday Creek and the Lester Creek watersheds.

Also see Services' response to Muckleshoot Indian Tribe Comment 1a.

Text: As a result of the land exchange, the impacts of the HCP will change for the species discussed below.

85. Comment on Impacts of the HCP: The proposed amendments to the HCP do not list salmon. Given the potential loss of large woody debris recruitment, it is unclear why the impacts to salmon have not changed.

Services' Response: The Services believe that none of the information in the narrative needs to be changed by Plum Creek with respect to salmonids. The effects expected with the modification are within the range described by Plum Creek in the original HCP. Given the unquantifiable, yet small amounts of potential reduction in large woody debris, the Services believe the quantity and quality of habitat resulting following the land exchange will be as Plum Creek described in the original HCP. However, we do note that they will be making changes to tables (such as 27A and 28A), which are indirect assessments of impacts/benefits in a more quantitative manner than the narrative statements.

Text: Table B. Width Requirements (in feet) for Riparian Management Areas ..

86. Comment on term "Buffer:" The FSEIS should expand the table to include the no-harvest part of the RMA and the managed part of the RMA. For example, on fish-bearing stream, Plum Creek can cut to within 30 feet of the stream and remove 50% of the potential large woody debris recruitment in the remainder of the 200 foot RMA. Secondly, as actions are permitted within the RMA, the term buffer should be dropped from the Table.

Services' Response: As stated in Section 3.3.3.1, the Riparian Habitat Areas were designed by Plum Creek to provide large woody debris, shading, nutrient input, and bank stability that are sufficient to protect and maintain aquatic habitat for fish. The RHAs apply to all fish-bearing streams and to perennial, nonfish-bearing streams with the greatest potential to influence habitat in fish-bearing waters. The Services believe that the RHAs provide protection similar to that provided by FEMAT buffers for Type 1-3 and most Type 4 streams, and that by allowing minor amounts of harvest in riparian areas Plum Creek can actually help to restore many areas previously impacted by natural and harvest-related disturbance. For this reason, the Services do not agree that the term "buffer" should be deleted from the table.

87. Comment on Inner Gorges and Small Streams : See Table 1, Note 2. The statement that inner gorges are protected and that watershed analysis may require buffers or large buffers in some areas is not supported by the watershed analyses that have occurred, or are ongoing in the Green River. Additionally, many Type 4 and most 5 streams are not typically analyzed in watershed analysis.

Services' Response: The Services disagree completely with this comment. Inner gorge protection is addressed directly in ongoing and in completed watershed analyses in the Green River. For example, the recently completed Howard Hanson/Smay Creek Watershed Analysis addressed protection prescriptions for inner gorge buffers and for Type 4 and 5 streams. The Services also note that the Muckleshoot Indian Tribe had two representatives on the Watershed Analysis Prescription Team, more than any other entity besides the DNR. In addition, the Watershed Analysis Prescription Teams for the Upper Green/Sunday Creek and the Lester Watersheds, prescribed mandatory and minimum 50-foot no-touch buffers on Mass Wasting Mapping Units (MWMUs) 4, 7, 9, 11, 11a, 12, and 13.

Additional protection is being provided through watershed analyses that have occurred in the Green River Basin. As an example, there are 18 Causal Mechanism and Prescription Reports related directly to riparian areas in the Lester Creek Watershed Analysis. A brief summary of the prescriptions related directly to protection of streams, especially Type 4 and 5 streams, is provided below:

- Delineate Channel Migration Zones (CMZs)
- No harvest allowed in CMZ
- Mark 70- to 100-foot wide Riparian Management Zone (RMZ) measured horizontally from the outer edge of the CMZ
- No harvest within 30 feet of the ordinary high water mark (OHWM) of any connected or unconnected side-channel
- Over the entire RMZ leave 70 conifers/acre greater than 12 inches dbh. If 70 conifers greater than 12 inches dbh do not exist, leave 100 of the largest conifers/acre
- Silvicultural manipulations should be aimed at providing restoration of historical stand conditions
- If no definable CMZ exists, apply the following RMZ width from the OHWM:
 - McCain and Bald Creeks — 70 foot
 - Champion, Friday, and Sawmill Creeks — 100 foot
- Stream segments on nonfish-bearing streams (i.e., DNR Types 4 and 5) require the following:
 - Identify a 25 foot RMZ from the channel disturbance zone (CDZ)
 - Leave 44 trees/acre (25 trees/1,000 feet) in the RMZ

Text: The wide buffers specified by Plum Creek's Riparian Management Strategy will also ensure adequate LWD from riparian corridors and minimize sediment deliver to streams.

88. Comment on LWD Source: This statement is subtly worded, but the important part to note is the term "adequate LWD from riparian corridors." The term adequate is not defined. Additionally, the undefined adequate quantity of LWD is from the "riparian corridors." The amended HCP should contain sufficient analysis for a reviewer to analyze the technical rationale supporting this statement. Under the current HCP, for Types 1 through 3 streams, there is a 200 foot riparian habitat area (RHA) or in common parlance a riparian management zone (RMZ). Of this 200 foot RHA, only the 30 feet closest to the stream channel is a no harvest zone. Up to 50% of the merchantable wood can be removed from the remaining 170 feet of the RHA. All of 100 foot RHA of Type 4 streams is open to harvest, with only simple requirements for leaving some trees. The DEIS for the Plum Creek HCP reads "*by providing at the equivalent of at least one tree height of protection for fish-bearing streams, litter fall and stream shading will be fully maintained, and the 200-foot RHAs are expected to provide, at a minimum, 85% percent, and in most instances, up to 100% of the woody debris inputs that occurred under natural conditions.*" This wording is restricted to the provision of large woody debris from the adjacent riparian corridor and can not be interpreted to mean, as the DSEIS implies, that total large woody debris recruitment potential into the streams as derived from both adjacent, upstream and upslope sources will in most instance equal 100% of natural conditions. The Services are referred the NMFS response in Chapter V of its comments on the State of Oregon Coastal Coho Plan for a detailed discussion of this issue⁶.

Another document prepared by the United States Forest Services cites one study that states that LWD would decline to approximately 50% of the pre-harvest levels before significant inputs of LWD from regrowth in the riparian zone. The initial new recruitment would not be sufficient in quantity to compensate for the losses. It also notes that if a second riparian harvest occurred, instream LWD levels would be expected to decline even further over time to a point where instream LWD would be minimal to non-existent⁷. The extent to which this issue has been considered regarding the effectiveness of the HCP should be clearly stated in the proposed amendments.

An environmental document for the I-90 Land Exchange implies that there are no studies to document that the Plum Creek RMAs are able to provide the same level of protection as the Riparian Reserves⁸. Additionally, the established Riparian Reserves on federal lands are adequate for all riparian functions including a safety margin to offset risks to habitat from unknown or uncontrollable factors (Murphy, 1995)⁹. The standards for the HCP do not allow for a safety factor.

⁶ A Draft Proposal Concerning Oregon Forest Practices. Submitted by the National Marine Fisheries Services to the Oregon Board of Forestry Memorandum of Agreement Advisory Committee and the Office of the Governor.

⁷ I-90 Land Exchange Draft Environmental Impact Statement. USDA Forest Service/Plum Creek timber Company L.P.

⁸ I-90 Land Exchange Draft Environmental Impact Statement. USDA Forest Service/Plum Creek timber Company L.P.

⁹ I-90 Land Exchange Draft Environmental Impact Statement. USDA Forest Service/Plum Creek timber Company L.P.

Services' Response: *The Services believe that large wood recruitment from the RHAs will be an adequate contribution toward fish habitat, when considered with other "upstream" sources. The RHAs are expected to provide large wood at full or near full potential given their current conditions. We do acknowledge that, taken on a system-wide basis, the Green River will recruit something less than it would if it was an unmanaged watershed. We also have previously agreed that the trend will continue down before it can be reversed; unless active and direct restoration is applied. However, that may not be the most cost-effective tool. We previously responded to the statement that there are no studies indicating that the HCP Riparian Management Strategy would be equivalent to or greater than the strategy currently being applied to Federal lands, and once again note that there are also no studies indicating that the Federal strategy will provide more. The RHAs do allow for a safety factor. Large wood of key piece size will generally be recruited from something less than a site-potential tree height. The RHAs for fish-bearing streams offer more than a site-potential tree height and RHAs for nonfish-bearing perennial streams offer something that is equivalent to Federal Riparian Reserves on steep ground (albeit slightly less on gentle terrain).*

Since it was released, NMFS' draft proposal concerning Oregon's Forest Practices (A Draft Proposal Concerning Oregon Forest Practices. 1998. Oregon Board of Forestry Memorandum of Agreement Advisory Committee and the Office of the Governor. NMFS, Portland, Oregon), has been the subject of much discussion among concerned parties. There was scientific disagreement among the scientists consulted by NMFS in the process of developing their proposal. As would be expected in a negotiation environment, NMFS' proposal represents the more-conservative approach. NMFS wishes to clarify several important issues related to the riparian management zones (RMZs). These matters may not have been adequately explained, examined, or understood to this point.

NMFS emphasizes that this is a draft proposal that was presented to the Oregon Board of Forestry's Advisory Committee for discussion and possible modification. At this point, the concepts contained in the draft RMZ proposals may be more important than the details. Those concepts include (1) Establishment of an inner RMZ that is managed for a lower risk to salmon habitat than the outer zone, primarily to provide bank stability and assist with shade, litter fall, and sediment filtration; (2) Establishment of an outer zone that is managed somewhat less conservatively, primarily for large wood recruitment, shade, litter fall, and sediment filtration; (3) Assurance that greater numbers of large trees will grow and fall into the streams, where needed; and (4) Assurance that unstable areas adjacent to streams will be included in the RMZs.

Reviewers of this draft report should understand that the RMZs are presented as interim default measures that would be adjusted following a watershed analysis. For example, following a watershed analysis, areas that are important sources of large wood, cold water, and sediment, or that are adjacent to important salmon spawning and rearing areas could be protected with relatively large RMZs, while areas that are less important could be protected with smaller RMZs. NMFS believes that watershed analyses should be conducted as rapidly as feasible. NMFS also recognizes that prescriptions need to be developed in the context of species information and that land managers need to design conservation that fits the ground as well as the needs of the land manager.

Second, some reviewers have characterized the RMZs as excessively large, no-touch zones. While the RMZs are larger than the current riparian management areas as prescribed by State rules, the RMZs proposed for all types of perennial streams would allow management (e.g., thinning) until mature forest conditions (i.e., 80-200 year-old stands) are attained. Since stands are young on most private

forest lands on the Oregon Coast, this would mean management in those areas would continue for several decades. During that time, riparian and fisheries science would continue to evolve, and management measures likely would change as well.

For intermittent streams, there would be a 30-foot inner no-harvest zone for streams on slopes over 30%. For the outer part of the RMZ, and for the entire RMZ on slopes less than 30%, the RMZ could be managed (e.g., thinned) to grow mature trees. However, unlike the requirements for perennial streams, selective harvest would continue in the RMZs on intermittent streams after mature forest conditions are attained.

NMFS agrees that the desired riparian conditions described in the Oregon Forest Practice Rules (629-640-000, below) are necessary, but not sufficient by themselves, for the long-term survival of coho salmon.

(2) The desired future condition for streamside trees along fish streams is to grow and retain vegetation so that, over time, average conditions across the landscape become similar to those of mature streamside stands. Oregon has a tremendous diversity of forest tree species growing along waters of the state and the age of mature streamside trees varies by species. Mature streamside trees are often dominated by conifer trees. For many conifer stands, mature stands occur between 80 and 200 years of stand age. Hardwood stands and some conifer stands may become mature at an earlier age. Mature stands provide ample shade over the channel, an abundance of large woody debris in the channel, channel-influencing root masses along the edge of the high water level, snags, and regular inputs of nutrients through litter-fall.

(4) The desired future condition for streamside areas that do not have fish use is to have sufficient streamside vegetation to support the functions and processes that are important to downstream fish uses and to supplement wildlife habitat across the landscape. Such functions and processes include: maintenance of cool water temperature and other water quality parameters; influences on sediment production and bank stability; additions of nutrients and large conifer organic debris; and provision of snags, cover, and trees for wildlife.

The draft NMFS proposal is designed to ensure that these conditions will be achieved in coho salmon watersheds on the Oregon Coast in a manner that supports the long-term survival of this species. In this regard, the Services believe that the Plum Creek HCP meets the intent of the NMFS proposal.

The following table may help to further clarify the information presented in the proposal.

Riparian Management Zones. NMFS February 17, 1998 Draft Proposal.

<u>Feature</u>	<u>Perennial Fish-Bearing Streams</u>	<u>Perennial nonfish-Bearing Streams</u>	<u>Seasonal (intermittent) streams</u>
Inner RMZ Width	30 feet	30 feet	Slopes under 30% - 0 feet. Slopes over 30% - 30 feet.
Total RMZ width	1 site-potential tree (150-200 feet)	2/3 site-potential tree (100-150 feet)	½ site-potential tree (75-100 feet).
Silvicultural Target - Inner RMZ	Grow mature forest conditions typical of a 80- to 200-year old stand at that site. Retain relative density of at least 50.	Grow mature forest conditions typical of a 80- to 200-year old stand at that site. Retain relative density of at least 50.	Slopes under 30% - retain relative density of at least 30. Slopes over 30% - total tree retention
Activities - Inner RMZ	Light thinning only, without ground-based equipment.	Light thinning only, without ground-based equipment.	Slopes under 30% - pre-commercial or commercial thinning only. Slopes over 30% - total tree retention.
Silvicultural Goal - Outer RMZ	Grow mature forest conditions typical of a 80- to 200-year old stand at that site. Maintain a relative density of at least 30 during any timber harvest. Retain the largest trees for LWD.	Grow mature forest conditions typical of a 80- to 200-year old stand at that site. Maintain a relative density of at least 30 during any timber harvest. Retain the largest trees for LWD.	Grow and retain mature trees for LWD while allowing selective harvest. Maintain a relative density of at least 30 during any timber harvest.
Activities - Outer RMZ	After the RMZ attains mature forest there would be no further management and the stand should be allowed to grow. A written plan should be required for timber harvest within an RMZ.	After the RMZ attains mature forest conditions there would be no further management and the stand should be allowed to grow. A written plan should be required for timber harvest within an RMZ.	Selective harvest allowed after mature forest conditions attained (maintain relative density of at least 30). No written plan required for timber harvest in RMZ.

Text: Watershed Analysis will be accelerated in 20 watersheds in the planning area and evaluations, subject to SEPA review will be submitted up to 10 years following issuance of the permit.

89. Comment on Watershed Analysis Schedule: The Watershed Administrative Units should be named to avoid any confusion as the DSEIS refers to WAU in which Plum Creek owns more than 10% of the land. The original term of five years should remain in the Green River. Extending the original five-year limit to 10 years will lead to continued reductions of the natural processes that create and maintain salmon habitat.

Services' Response: The extension of the watershed analysis schedule was completed prior to this proposed action. The schedule extension was made primarily in response to tribal comments requesting such a delay. The Services and Plum Creek will schedule the initiation of the last remaining Green River WAU to coincide with the desires of the Muckleshoot Indian Tribe. Regarding Plum Creek's lands in that WAU (i.e., North Fork Green), to the extent sensitive situations exist similar to those in areas with completed watershed analysis and it is reasonable to do so, extrapolation of prescriptions to adjacent WAUs will be used to ensure that impacts occurring during the interim are commensurate with those which might have occurred had watershed analysis already been performed.

The Services agree that confusion could be avoided if the WAUs were identified and has requested that Plum Creek include a tentative schedule, by WAU, for completion of Watershed Analysis.

Text: Change the 5 year commitment for completion of the analysis to 10 years

90. Comment on Speculative Prescriptions: It is incorrect to assume that Washington State Watershed Analysis will result in prescriptions that are protective of salmon habitat and the processes that create and maintain that habitat. A recent analysis of the watershed analysis prescriptions¹⁰ revealed a high percentage of the prescriptions purportedly tailored to protect public resources did not follow from the resource assessment, were experimental, and indeed were even speculative.

The proposed amendments to the HCP should specify what action the Services will undertake to ensure that the prescriptions that are developed are protective of natural resources. For example, representatives of the Services have attended very few of the meetings held for watershed analysis prescriptions for the Smay Creek and Howard Hanson Watershed Administrative Units. Furthermore, if members of the Services do attend watershed analysis meetings, the proposed amendments should state what limitations, if any, exist upon the ability of the Services to make comments requesting that due to site specific concerns or information generated as a result of watershed analysis, that the interim and default RMAs and other habitat protection measures in the HCP are insufficient and need to be improved.

Services' Response: The Services assume that the Muckleshoot Indian Tribe is generally referring to watershed analysis as a whole, and based upon discussions with the Muckleshoot Indian Tribe, is further assuming that many of the problems associated with watershed analyses mentioned in the first

¹⁰ Brian Collins and George Pess, 1997. Evaluation of Forest Practices Prescriptions from Washington's Watershed Analysis Program. Manuscript submitted to the Journal of American Water Resources Association.

paragraph of their comments, stem from watershed analyses completed and being implemented by other timber companies. The Services are anxious to discuss potential solutions with respect to disconnect of prescriptions and resource assessment.

The Muckleshoot Indian Tribe's comments raise an interesting point: that, in the event of disagreement about the adequacy of watershed analyses, what mechanisms would be available to resolve such a dispute? The Services believe that the Implementation Agreement provides some guidance in that regard, but we also believe less formal mechanisms could be used. When the Muckleshoot Indian Tribe contests the conclusions derived during a resource assessment or prescription-drafting process, they should notify the Services. The Services would then call a meeting with Plum Creek and the Tribe's watershed analysis representatives to resolve the dispute. The Services believe that a simple solution may be available to this question and welcomes further input from the Tribe in this regard.

Text: Subsequent to the implementation of the HCP and with the accelerated WAUs discussed above, discussion with the Services and tribal staff members disclosed a concern by tribes that they have limited time resources to met the time lines for Plum Creek analysis and participate in watershed related activities with other companies and organizations. All parties agreed it might by appropriate to slow down to ensure tribal participation in the process.

91. Comment on Watershed Analysis Schedule: While the intent to ensure that Tribes are not overwhelmed due to the work load is most commendable, in the case of the Muckleshoot Indian Tribe, the concern is outdated. Following the signing of the HCP, the Tribe was faced with watershed analysis covering four WAUs. Plum Creek was most responsive to the concerns of the Tribe and slowed their analysis. Additionally, when the Muckleshoot Indian Tribe raised the issue with the Services, one of the factors was that it appeared the Tribe would face four separate watershed analyses. However, the timber industry and the WDNR, elected to clump the WAUs in units of two for the purposes of analysis. Thus, the number of meetings the Tribe was required to attend dropped significantly. Furthermore, with more staff and by concentrating on key issues, over the last years, the concern of the Muckleshoot Indian Tribe has not been the speed of watershed analysis, but the quality and slowness of it. The protection of natural resources in the Green River requires that the watershed analyses, that have been initiated be completed promptly. However, initiation of the last remaining WAU in the Green River could be deferred to near the end of the original five-year commitment.

Services' Response: See above response related to completion of watershed analysis. The Services note that the specific timing for initiation of watershed analysis is not something the Services can establish unilaterally. The timing of the watershed analysis for each WAU is at the discretion of Plum Creek, not the Services. The Services and Plum Creek will schedule the initiation of the last remaining Green River WAU to coincide with the desires of the Muckleshoot Indian Tribe. The Comment above indicates that this would most likely be in 2004. We invite the Muckleshoot Indian Tribe to confirm whether they would prefer to accelerate, delay, or retain that schedule. Regarding Plum Creek's lands in that WAU (i.e., North Fork Green), extrapolation of prescriptions to adjacent WAUs will be used to ensure that impacts occurring during the interim are commensurate with those, which might have occurred had watershed analysis already been performed. Further, the Services believe that our (i.e., Services' and Plum Creek's) outdated response to the needs of the Muckleshoot Indian Tribe is a symptom of much needed improvement for coordination and more-frequent communication.

C.III COMMENTS ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT PORTIONS RELATIVE TO CULTURAL RESOURCES

Text: Section 3.10 Cultural Resources

92. **Comment on Outdated and Inaccurate Information:** Both the 1995 Draft and Final EIS for the HCP, as incorporated by reference into the DSEIS, and the Draft Supplemental EIS contain outdated, inadequate, and inaccurate information regarding the cultural resources of the Muckleshoot Indian Tribe that are found within the Planning Area. Statements such as “The prehistoric period in interior western Washington came to a close during the middle 1800’s when the territorial governor began efforts to work with Native Americans” (p. 3-14 DSEIS) are both historically and politically incorrect. More accurate words and contexts, such as “precontact” period, or a fair explanation of the Stevens Treaty-making and its consequences, should be employed by the Services. Inaccuracies also abound in the discussions incorporated at pp. 3-110 and 3-111 of the incorporated DEIS/FEIS. For example, the environmental review states incorrectly that hunting of game occurred next to riverside village sites with the exception of mountain goat. Hunting was extensive throughout the basin.

Services’ Response: The historic inaccuracies mentioned in the DSEIS have been corrected. The Services agree that hunting was wide-spread throughout the basin. Additional changes to the FSEIS have been made as a result of these comments and comment 93 below.

93. **Comment on Recent Information:** The DEIS/FEIS claims to rely upon extensive use of a 1987 Forest Service *Cultural Resources Overview* compiled without the benefit of consultation with knowledgeable members of the Muckleshoot Indian Tribe. There has been a large amount of archaeological and ethnographic information developed since 1987, and since 1995, for the upper Green River watershed, including:

Surveys and reports pursuant to Section 106 of the National Historic Preservation Act developed by the US Forest Service for the Huckleberry Land Exchange, and language incorporated into the Final EIS for that project (available Mount Baker Snoqualmie, Administrative record and Washington Office of Archaeology and Historic Preservation); and

Comments submitted to the Forest Service by the Muckleshoot Indian Tribe and its ethnographic contractor correcting Forest Service information for the Huckleberry Exchange (MBS Administrative Record) ; and

Surveys and reports pursuant to Section 106 of the National Historic Preservation Act developed by Plum Creek Timber Company and Forest Service contractors for the I-90 Land Exchange, and language incorporated into the Draft (and forthcoming final) EIS for that project (available Wenatchee National Forest Administrative Record, Washington Office of Archaeology and Historic Preservation); and

Comments submitted by the Tribe to the Forest Service correcting information in the I-90 Land Exchange Draft EIS (Wenatchee Administrative Record) ; and

Results (forthcoming 2/15) of a Traditional Cultural Properties (TCP) study for the Upper Green River, for which a public summary will be submitted to the Forest Service and to the Plum Creek Timber Company, as well as to the Services. (Muckleshoot Indian Tribe TCP Study, available 2/15 Muckleshoot Indian Tribe).

For example, additional archaeological sites eligible for the National Register, including Trails and campsites, have been discovered within the planning area on both Forest Service and Plum Creek Timber

Company land, and other properties are currently under consideration by the Forest Service and consulting parties to the NHPA. (per section 3.10.2 Historic Resources, p. 3-15 DSEIS).

The DSEIS acknowledges some of these recent sources of information under its discussion at 4.10 Tribal Trust Responsibilities on p. 4-60, yet the Services do not seem to have made the effort to incorporate the results into their analysis. At the very least, the Services must honor their trust duty for assuring a meaningful consultation process, and incorporate reliable information from recent sources into the present EIS document regarding past and present cultural use of the Upper Green River, without which the analysis remains defective.

Services' Response: The Services look forward to continuation of discussions between Plum Creek and the Muckleshoot Indian Tribe with respect to cultural resources discussed in these documents. A number of changes have been incorporated into the FSEIS to reflect the comments made above.

Text: Section 3.10.3 American Indian Uses and Concerns

94. Comment on Use of Cultural Resources: Review of the documents referenced above would provide information on extensive contemporary use by the Muckleshoot Indian Tribe of the Planning Area for hunting and gathering of food, pure spring water and medicinal and artisan's plants, as well as use for spiritual retreat. (see especially Muckleshoot Indian Tribe TCP Study, forthcoming 2/15). Past uses, including periodic controlled burning, resulted in identifiable landscapes altered by Muckleshoot ancestors that are still in evidence within the planning area.

Presence of culturally sensitive plant species is extensively dealt with in the forthcoming TCP Study for the Upper Green River. Agency review for culturally sensitive plants was referenced in the Final EIS (1996) for the HCP at p. A-53, but these resources were apparently not examined at that time, nor have they been analyzed since in the Planning Area by Plum Creek or any federal agency. Therefore the work incorporated into the Muckleshoot Indian Tribe TCP Study appears to be unique and especially valuable in this regard.

Although any predictive model would probably identify high probabilities for archaeological and cultural uses at streamside sites, undue emphasis of these areas (DEIS 1995 p. S-31 and 32 and FEIS 1996, p. 12) at the expense of additional analysis is unwarranted, especially in light of the relatively narrow width of riparian protective schemes.

Services' Response: The above mentioned effects are considered by the Services through the environmental documents and NHPA analysis for the I-90 land Exchange, which are incorporated by reference. The original FEIS included an assessment within section 4.7.4 for nonvascular plants. This is the brief assessment referred to as an "analysis" on FEIS A-53.

However, the Services have incorporated portions of the recent Traditional Cultural Properties report into the FSEIS and believe that report is a very valuable document. In addition, the Services have modified the FSEIS to include much of the information provided by the Muckleshoot Indian Tribe. The services also acknowledge that riparian buffers alone will not protect all cultural resources, but believe they will help in that regard.

Text: Section 3.10.4 Cultural Resource Preservation

95. **Comment on Predictive Model:** During discussions between Plum Creek Timber Company and the Muckleshoot Indian Tribe regarding the current Plum Creek HCP amendment process, the Company has expressed interest in, and some level of commitment toward, developing a predictive model for areas of past human activity for the West side similar to that designed for the Yakama Tribe. An express commitment would be a positive step, and could be incorporated into the language of the HCP. A section 3.10.5 could then be added to address the Plum Creek and Muckleshoot Indian Tribe Relationship.

Services' Response: The Services understand the concerns of the Muckleshoot Indian Tribe and the desire for a model that could be used in the Green River Basin and encourage Plum Creek to work with the Tribe in developing such a model. We look forward to hearing the results of the collaborative working group. The Services note, however, that this action goes beyond the scope of the mitigation measures that are being required as a result of the NHPA consultation process conducted by the Forest Service for the I-90 land exchange.

D. WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

1. **Comment on HCPs:** As you know, the Washington Department of Fish and Wildlife has contributed a substantial amount of time providing technical information for and review of Habitat Conservation Plans (HCP) in this state, beginning with the Murray Pacific HCP. We support the concept of landscape-level, multi-species conservation planning, particularly when it is based on sound scientific and conservation principles and provides opportunities to redress uncertainty through adaptive management.

Services' Response: The Services have appreciated the technical support and assistance of the Washington Department of Fish and Wildlife staff to ensure that HCPs are based upon sound science, employ appropriate conservation principles, and encourage adaptive management in areas where uncertainty exists. Indeed, the Department has participated in each of the HCPs in the State at some level. The participation of the various experts the Department has made available to the Services have improved the quality of HCPs in Washington State. This involvement has included peer review of technical documents during a time when such peer review was being pioneered in the realm of HCPs, and also included strong encouragement by the Department to develop adaptive-management strategies. Such encouragement resulted in the pioneering of adaptive management for HCPs within the State of Washington. As a result, the State of Washington is setting an example for HCPs across the Nation in this regard.

2. **Comment on Owl Impact Assessment:** In earlier written comments on this HCP and the proposed land trade, as well as written positions on HCPs in general, we expressed a variety of concerns, including the importance of designing impact assessments and mitigation strategies to address spatial and temporal conservation objectives of species to be covered by an incidental take permit. We understand that this HCP is not open for renegotiation. However, we would like to point out that the new state Forest Practices Rules for spotted owls were designed to compliment the Northwest Forest Plan and that these rules were based on stated conservation functions in specific areas of non-federal lands, including the area encompassed by the proposed land trade. It is an uncommon luxury that consensus-based conservation objectives are available to assist in the development of credible forest management strategies. Consequently, we believe the land trade should be assessed relative to specific conservation objectives, rather than the vague approach included in the DEIS.

Services' Response: The Services concur with the Department regarding the desirability of such analysis. However, we do not believe that analyses already completed are vague. We believe those analyses are very instructive to determine how the HCP compliments other conservation planning documents. Nevertheless, the Services will continue to work with the Department to determine the appropriate analysis with respect to this and other HCPs. In the information below, the Services have provided a map displaying the relationship of the Spotted Owl Special Emphasis Areas (SOSEAs) to the HCP Planning Area. The Services have also provided the land ownership and Federal land designation information for each of these areas. A description of the amount of nesting habitat and the amount of foraging/dispersal habitat expected by each SOSEA, as well as the amounts of land in the three categories for probability of occupancy are provided for current conditions, mid-point of the HCP term (2016), and for the end of the HCP term (2045). In this way, the reader can compare such habitat amounts and the probability of occupancy to the goals of each SOSEA.

For the SOSEA lands with a goal of demographic support on the West side of the Cascades Crest, suitable owl habitat begins at 44 percent, decreases to 33 percent at the mid-point of the HCP term, and then returns to 43 percent. On the East side of the Cascade Crest, the demographic-support area

begins at 51 percent, decreases to 47 percent, and increases to 61 percent, for a net increase of 10 percent. For medium and high probability of occupancy categories, in demographic-support areas west of the crest, the values are 25, 18, and 24 percent for the beginning, mid-point, and end of the HCP term, respectively. The values for the east-side, demographic-support areas are 49, 46, and 48 percent, respectively. A very small percentage of the HCP Planning Area lies within the SOSEA area for which there is a "combination" goal of demographic support and dispersal. For that area the suitable habitat values change over time as follows: 70, 78, and 68 percent; while the percentage of the area in the medium and high occupancy categories is 93, 95, and then 96 percent. Some SOSEA areas have only a dispersal goal. On the East side, the habitat values over time are 39, 35, and 50 percent and the medium and high occupancy categories are 39, 34, and 41. On the West side, the habitat values are 44, 31, and 40 percent and the medium and high occupancy categories are 29, 23, and 22 percent.

These values display that the goals of supporting dispersal across the landscape are assured the best success when owl sites are maintained within the landscape for which connectivity is important. Merely providing "conveyance" habitat, for instance, would not achieve such landscape goals. Spotted owls need to find roosting and foraging sites throughout a landscape designed for connectivity purposes. However, it is far better for connectivity if actual nest sites are maintained and maintained in a productive capacity in the intervening areas. In this manner, young owls are produced and disperse to adjacent areas. These are the mechanisms by which effective connectivity is maintained. The HCP does not differentiate between portions of the Planning Area in its goals for spotted owls. The goal was to maintain as many owl sites as possible, especially productive owl sites, while also providing for a landscape conducive to north-south connectivity. The HCP Planning Area, and resulting habitat amounts, are not differentiated much between areas designated for dispersal or demographic support under the State Owl Rule, but each of these areas appears to the Service to meet the general goals established in that landscape-planning process. The Service will analyze the data further in its upcoming reinitiation of the Biological Opinion on the Federal action of modifying the HCP to incorporate the new land base. As part of that process, the Service will coordinate with the Department and seek their assistance.

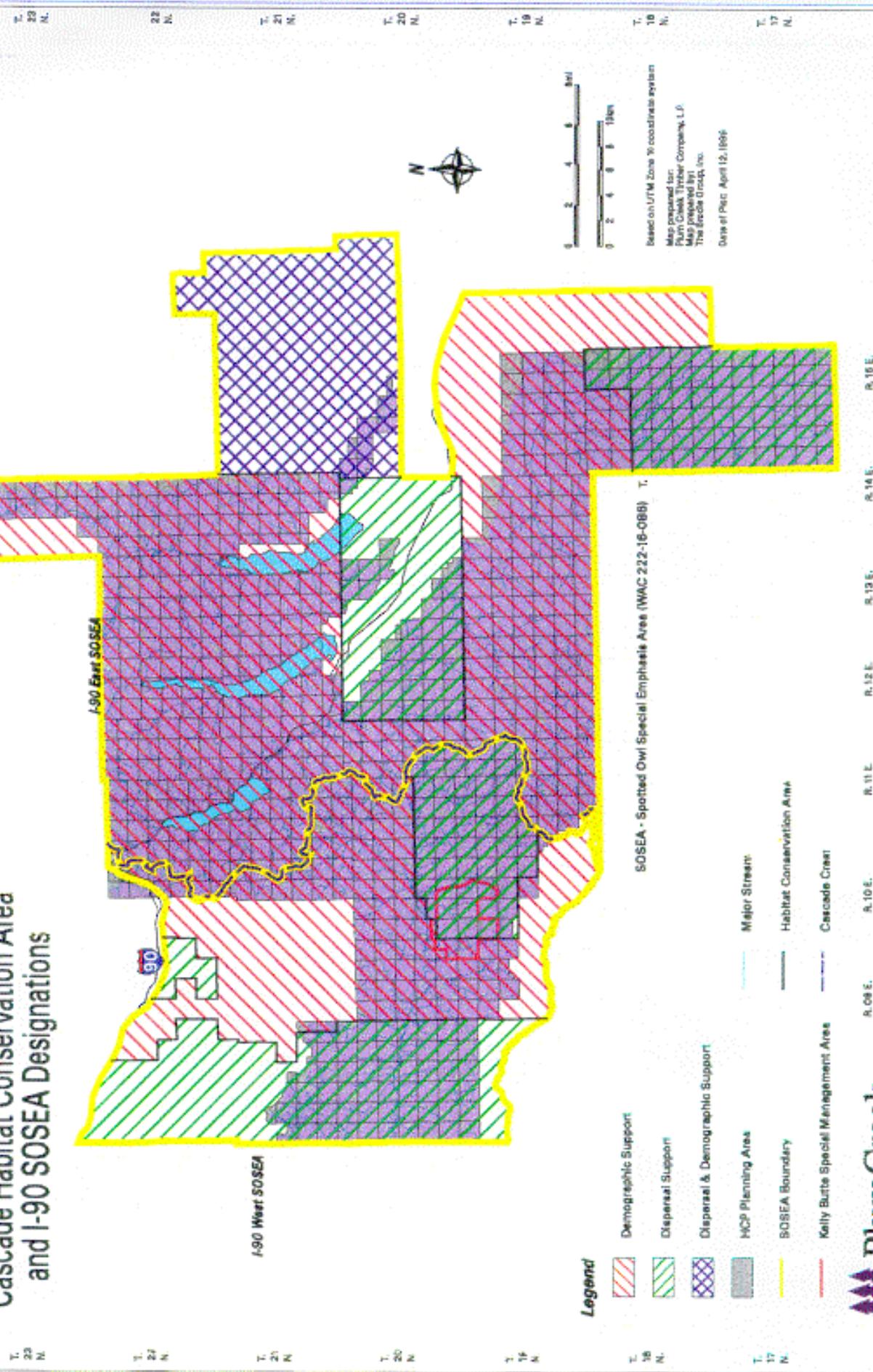
Post-land exchange spotted owl habitat and nest site probability for Spotted Owl Special Emphasis Areas (SOSEA) that overlap the Planning Area (see Figure following). Definitions of spotted owl habitat (FD, NRF) and a description of the Resource Selection Probability Function model can be found in Plum Creek's Cascades Habitat Conservation Plan (1996).

Plan Year	SOSEA	SOSEA subarea role	% FD	% NRF	% High Probability	% Medium Probability	% Low Probability
1997	I-90 West	Demographic	19	25	2	23	67
		Dispersal	21	23	3	26	66
	I-90 East	Demographic	17	33	17	32	36
		Dispersal	16	23	3	36	45
		Combination	31	39	43	50	4
2016	I-90 West	Demographic	12	21	2	16	74
		Dispersal	11	20	5	18	72
	I-90 East	Demographic	16	31	14	32	39
		Dispersal	17	18	2	32	51
		Combination	36	42	47	48	1
2045	I-90 West	Demographic	19	24	4	20	68
		Dispersal	21	19	5	17	73
	I-90 East	Demographic	27	34	17	31	37
		Dispersal	29	21	4	37	43
		Combination	37	31	38	58	1

Post-land exchange ownership and Forest Service Northwest Forest Plan designation for the I-90 West and East Spotted Owl Special Emphasis Areas (SOSEA) within the Planning Area (see Figure following).

SOSEA role (I-90 West / East)	Land ownership / designation						
	Plum Creek	US Forest Service					Other (state / private) total
		AMA	LSR	Matrix	Cong. / Admin. Withdrawn Areas	Total	
Demographic	74,285	118,673	49,622	3,019	8,884	180,198	21,423
Dispersal	53,918	3,137	12,548	34,860	4,837	55,412	23,314
Combination	2,950	-	-	-	-	-	537
Total	131,154	121,810	62,170	37,879	13,751	235,510	45,274

Cascade Habitat Conservation Area and I-90 SOSEA Designations



T. 23 N. T. 22 N. T. 21 N. T. 20 N. T. 19 N. T. 18 N.
 R. 09 E. R. 10 E. R. 11 E. R. 12 E. R. 13 E. R. 14 E. R. 15 E.

Legend

- Demographic Support
- Dispersal Support
- Dispersal & Demographic Support
- HCP Planning Area
- SOSEA Boundary
- Kelly Butte Special Management Area
- Major Stream
- Habitat Conservation Area
- Cascade Creek

SOSEA - Spotted Owl Special Emphasis Area (WAC 222-18-088)



Based on UTM Zone 10 coordinate system
 Map prepared for Plum Creek Timber Company, L.P.
 Map prepared by The Arcata Group, Inc.
 Date of Plot: April 12, 1999



3. **Comment on Exchange of LSR:** We encourage the U.S. Forest Service to reconsider trading Late Successional Reserve and Adaptive Management Area lands to Plum Creek. The trade of such lands is a significant deterrent to general public support of ITP issuance for species on nonfederal lands because it underscores a concern held by many: that an unrealistic reliance may have been placed on our federal lands for conservation of threatened and endangered species. This is a precedent we do not wish to see established by the USFS or USFWS.

Services' Response: The Services concur with this comment, and offer our understanding of how this exchange evolved. During the development of the HCP we received comments from the Forest Service stating that HCP maps were in error and these subject sections were actually Matrix. We later received similar comments from the Forest Service when we designated those parcels as Critical Habitat for the marbled murrelet. Plum Creek entered into discussions with the Forest Service regarding land exchange and subsequently considerable time and effort was directed toward this exchange. It was then discovered that errors existed in the Mount Baker - Snoqualmie National Forest Geographic Information System. Up until that point, the Forest Service was convinced that they were only trading out of Matrix lands. The master map for the NWFP was consulted and it was verified that these lands were indeed LSR. Subsequent discussions between the Forest Service, Fish and Wildlife Service, and Plum Creek resulted in the development of another alternative. This alternative was one that included the development of a block of Federal ownership in the vicinity of the Critical Habitat sections. This block corresponds to Kelly Butte which has been designated as the Kelly Butte Special Management Area in the legislation for the I-90 Land Exchange. This 5,642-acre area shall be managed with special emphasis on preserving its natural character; enhancing water quality; permitting fishing and hunting; providing primitive and semi-primitive recreational opportunities; providing opportunities for scientific research and study; protecting and enhancing populations of fish, wildlife, and native plant species; and allowing for traditional uses by Native American peoples. To this end, Congress has prohibited commercial timber harvest and road construction, unnecessary motor vehicles, and all forms of entry and appropriation under the U.S. mining laws and mineral leasing laws.

The Fish and Wildlife Service is concerned about low-elevation, late-seral forests leaving Federal ownership in exchange for high-elevation lands. However, the Services are not decision-making parties on the land exchange. Once the land exchange decision has been made, the Services become decision-makers with regard to modification of the HCP. This is the action being addressed in this supplemental environmental impact statement.

4. **Comment on Ponderosa Pine Snags:** We recommend inclusion of specific protection and enhancement guidelines for snags in ponderosa pine habitats. Plum Creek will acquire areas of this habitat from the U. S. Forest Service, particularly in the eastern Manastash region.

Services' Response: The Services also believe that some additional detail is needed in this regard and has requested Plum Creek to insert language to clarify the prescriptions for wildlife trees in ponderosa pine habitats. The Services plan to continue working with WDFW and Plum Creek to complete clarification of these issues in the near future.

5. **Comment on Unbuffered Streams:** Table 28A indicates that 5 % of DNR Type 4 streams within the Planning Area will not be buffered. It was our prior understanding that such streams would be buffered. Please clarify this point.

Services' Response: On page 224 of the original HCP, it is stated that, "...and 25-foot RLTA's on perennial nonfish-bearing streams for at least 2,000 feet from the junction of a fish-bearing stream." On page 184 of that document (Table 28), the percent of DNR Type 4 streams to have 25-foot RLTA's or no buffer is estimated at 5 percent and 4 percent, respectively, for the Planning Area. As the Muckleshoot Indian Tribe has correctly pointed out, these percentages are likely to be higher when only the Green River Basin is analyzed. However, these numbers are also likely to be smaller when other factors are considered such as watershed analysis buffers, the number of Type 4 streams found to have fish, and other factors.

6. **Comment on Fish Passage:** Future plans indicate possibilities of fish passage for Howard Hanson dam on the Green River. We recommend that riparian buffers be developed and implemented within the Green River watershed.

Services' Response: The original HCP was developed to address fish in the Green River Basin. HCP, page 127, states, "...although Chinook salmon no longer occur naturally in the upper basin, Coho salmon and Steelhead trout remain widely distributed throughout the upper Green River (Figures 24 and 25)." "...The Tacoma Diversion Dam currently blocks all upstream migration of all adult fish. However, hatchery-produced Coho and Chinook fry are released in the upper basin for overwinter rearing." HCP Figures 24 and 25 display the distribution of planted coho and steelhead in the upper Green River Basin. While the HCP does not place the same emphasis on riparian buffers as it did on the east side where there were already/still natural runs of anadromous salmonids, it nevertheless was intended to be adequate for salmonids. There are buffers in place in the Green River Basin. In fact, HCP compliant buffers have been retained for over 2 years in the Green River portion of the HCP planning area even though no listed fish currently exist there. These have been 200-foot buffers on fish-bearing streams and primarily 100-foot buffers on perennial nonfish-bearing streams. The Services are not aware of any streams left unbuffered in harvests conducted since issuance of the Permit. Similarly, no 25-foot RLTA's have been left to date. Conversely, however, we are aware of 100-foot buffers, which have been left on seasonal streams within the Green River Basin in excess of HCP requirements. While we applaud Plum Creek's efforts at stream protection to date, we do not expect it to exceed the requirements of the HCP on every harvest unit in the future.

7. **Comment on Assistance:** In closing, I would like to offer the assistance of our staff as you work through the final details of this plan. We were involved in certain aspects of the original plan and would like to extend this involvement to this land trade. As always, please feel free to contact our staff to discuss any questions you may have. We appreciate this opportunity to provide feedback that we hope will improve the conservation planning process.

Services' Response: The Services intend to utilize the assistance offered and thank the Washington Department of Fish and Wildlife .

E. ALPINE LAKES PROTECTION SOCIETY

1. **Comment on HCP:** Here are ALPS' comments on the subject DSEIS for the revisions, mandated by the upcoming 1-90 Land Exchange, to Plum Creek Timber Company's Habitat Conservation Plan. In our opinion, the HCP itself is a bigger issue than the proposed revisions. Many organizations have sharply criticized the overall HCP process itself, particularly the no surprises/safe harbors concept and riparian habitat regulations.

Services' Response: The Services continue to believe that most of the criticism directed at this HCP has evolved from misunderstandings of the plan. Any comments or concerns regarding the original HCP and its contents, the benefits which have accrued from the "No Surprises" policy and regulations, the benefits which have accrued from application of the safe-harbors concept, and the value of the overall HCP process are beyond the scope of this proposed action.

2. **Comment on Seasonal Streams:** In Plum Creek's HCP, the lack of buffers along seasonal streams not in a gorge, is of particular concern.

Services' Response: The Services addressed the treatment of seasonal streams in the response to comments received on the DEIS (FEIS page A-41) and those comments received on the FEIS (ROD page 45). It is important to understand that saying streams in inner gorges will be protected, is not the same as saying streams outside inner gorges will not be protected. While there is no explicit protection stated within the HCP for seasonal streams outside inner gorges, a number of other factors combine to protect seasonal streams including the logistical placement of upland leave trees along many seasonal streams, longer rotations (which mean that a smaller percent of seasonal streams would be affected at any given time), use of uneven-aged management (which provides protection to adjacent streams), protection of special sites with buffers, watershed analysis, and a number of other factors. However, some seasonal streams will not be buffered. Science has not yet established a need to buffer seasonal streams except under certain situations, such as occurrence of inner gorges. Treatment of seasonal streams will be subject to adaptive management just as other aquatic/riparian components of the HCP.

3. **Comment on Adaptive Management:** We were pleased to learn at your January 21 open house in Issaquah that Plum Creek is using adaptive management so that, rather than being cast in stone, its HCP is continually being updated as new information becomes available. While the issue of state Watershed Analyses is also controversial, the HCP should be improved by the inclusion of these studies as they are completed.

Services' Response: Thank you for your comment. We also feel adaptive management is an important concept and a valuable component of this plan.

4. **Comment on Proposed Alternative:** Regarding the revisions, it is obvious that only Alternative 3, to incorporate into the plan all lands acquired from the Forest Service within the HCP boundary, makes any sense. No-Action Alternative 1 would be adopted only if the exchange fails. The exchange would improve the HCP under both Alternatives 2 and 3 for two primary reasons:
1. Most of the lands would now be under Forest Service jurisdiction and subject to the stricter FEMAT rules.
 2. Development can occur on no more than 5% of Plum Creek lands within the planning area. Because Plum Creek would own less land in the planning area (approximately 128,000 acres vs. 170,600 acres prior to the exchange), less land would be subject to development.

Alternative 2, which would keep the acquired lands out of the HCP, would generally be environmentally inferior (except in rare cases such as an occupied spotted owl nest) and it would be an administrative nightmare.

Therefore we will concentrate on suggestions to improve Alternative 3 and corrections that need to be made to the document.

Services' Response: Thank you for your comment. We do note that development is not a covered activity under this HCP. This HCP only addresses forest-management and related activities. With regard to "stricter" FEMAT rules, see response to Charles Phillips comment 5 (K, 5).

5. **Comments related to Habitat Conservation Plan Boundaries:** The draft Description and Analysis of Modifications to Plum Creek Timber Company's Cascades Habitat Conservation Plan states on pages 1 and 8 that the 1-90 Land Exchange will not require any changes to the HCP planning area. One reason you gave for this at the open house was that the government wants to make an "apples vs. apples" comparison of the effects of the exchange.

We strongly believe, however, that the planning area should be modified.

Plum Creek will move completely out of the northeast part of the planning area. The extreme northeast corner will be 12 miles from any Plum Creek land. Two townships (T22N, R13E, and T22N, R14E) will be devoid of Plum Creek property. The boundaries may make sense while Plum Creek and national forest lands are so intermingled, but they will not with the new arrangement.

One of the issues that was not emphasized enough while the current HCP was being developed was that it, like many others we have learned about since, rely heavily on the Forest Service to compensate in providing adequate habitat conditions. The fallacy of that reliance becomes obvious when one looks at the new configuration. How can a timber company rely on the management of lands so far away to help it out? Ideally, an HCP shouldn't rely on anyone else for help. It should be able to provide adequate habitat by itself.

We believe, therefore, that the northern boundary should be moved several miles south. We have provided our recommendation for a new boundary on the attached markup of Figure I (labeled here as Figure I-A) from the DSEIS. Note that the one half-section shown outside the proposed boundary will be donated to the Forest Service as shown in Figure 1-B.

On the other hand, we also believe that the HCP area should be expanded around Lake Cle Elum and Lake Kachess to match the boundary of the Alpine Lakes Area created by Congress in 1976. Our recommendation for this new boundary is also shown on Figure 1-A. It would add about 2,000 acres of post-exchange Plum Creek land to the planning area and help both the areas around the feet of both these lakes and the eastern shore of Lake Cle Elum.

Even though the planning area excludes practically all of Lake Cle Elum, we do not recall it being thoroughly discussed when the HCP was originally being developed. During the comment period of the 1-90 exchange, it became clear that a half-mile wide string of lands along the northeast shoreline of the lake would now be all under Plum Creek ownership but not have the benefits of an HCP. Including them now and keeping them from being developed would not only provide the same quality of habitat, it would also be in keeping with the goals of the Mountains to Sound Greenway.

At the January 21 open house, Mike Collins of Plum Creek commented that the Lake Cle Elum and Lake Kachess properties were left out because Plum Creek was not sure of its long-range plans for them. If the HCP boundary does stay the same for now for the reasons given, it should be revised when the statistical comparisons are no longer needed and Plum Creek has decided on its plans for its properties around the two lakes.

***Services' Response:** As the Commentor mentioned, the Services firmly believe that altering Planning Area boundaries would create a confusing situation. The Land Exchange is not complete and each of the alternatives has a different arrangement of HCP lands. The Planning Area boundaries must remain as they were originally described throughout this amendment process to ensure comparable analyses.*

The HCP does NOT rely on National Forest Lands or any other lands for mitigation. All HCPs must rely on their own minimization and mitigation measures. Those conservation measures should be commensurate with the impacts to result from the covered actions. In determining the impacts, it is often necessary to examine the landscape context. The Services use information such as whether the habitat or individuals to be "taken" are isolated far from the nearest breeding sites or other suitable habitat. We look at the impacts to the population and landscape factors. In Plum Creek's, case we looked at the impacts of its actions, but in the context of the NWFP.

Regarding the proposal to expand the Planning Area in other portions of the landscape, the Services have already responded to these types of comments in previous documents (Pages A-26 in the FEIS and 39 in the ROD). The original and continuing Planning Area boundaries were driven by the Growth Management Act boundaries. Areas not considered as long-term forestry lands, were not included as "covered lands" by Plum Creek.

The goals of Mountains-to-Sound Greenway are not a factor in section 10 decisions. The inclusion of lands in the HCP Planning Area is Plum Creek's decision. It is not the Services' decision to determine whether these lands are developed or not. However, if Plum Creek were to sell those lands and the new owner desired to harvest timber and/or develop these lands, all of their actions would need to be in compliance with the ESA, which would include either avoiding take of listed species or seeking authority to take listed species through mechanisms such as an HCP. However, those decisions would be the landowner's choice.

In conclusion, the Services recognize that HCPs are voluntary. Plum Creek determines which lands it wants coverage for in its HCP just as other landowners decide which lands they would include. The Services then decide whether the entire package warrants issuance of a permit. The possibility of revision for the Planning Area boundaries in the future does exist following completion of the land exchange. The Services will address that issue when the time comes. In the meantime, the documents display the amounts of habitat which are and will be present on Plum Creek's covered lands alone. This could be considered as the ultimate "shrink-wrap" around the covered lands as it excludes all lands not included as "covered lands" by the HCP.

Services' Response comments 6-12: *Thank you for the very accurate assessment of figures, maps and tables. All of your comments have been evaluated and incorporated into this FSEIS and the HCP Modification document which is an appendix.*

- 6. Comment on Errors in Exchange Figures and Maps:** The text, e.g. page 1-2, implies that the size of the exchange has already been locked in at about 53,400 acres going to the Forest Service and about 17,000 acres going to Plum Creek. Such statements are very premature; the situation is still very fluid. The maximum size right now is 62,384 acres going to the Forest Service and 16,495 acres going to Plum Creek. The size should be locked in by the time the final impact statement is released, but issues such as appraised values and restrictions on historic/cultural resources still need to be resolved. Plum Creek could opt out of acquiring some of the sections if the restrictions on them are too severe. HR 4328, Section 605(c)(2), lists the sequence of 27 sections of Plum Creek lands that could be deleted, if necessary, to balance the exchange.

All of this information should have been included in the DSEIS.

Likewise, we have found several errors in the two identical exchange maps (Figures 1 and 1A) after comparing them with the official exchange map dated October 1998 and national forest maps. They are listed below and shown in the attached markup of Figure 1 (listed here as Figure 1-B) to aid in making corrections for the FSEIS.

All lands in T19N, RHE, Sec. 6 and T20N, RHE, Sec. 31 (Kelly Butte) are shown to be owned by Plum Creek, either through retention or through trade. In fact, all lands west of Sawmill Creek in these sections will be in National Forest.

T22N, R11E, S19 (Ollalie Meadow) is shown remaining in Plum Creek ownership. It will be traded to the Forest Service.

Per HR 4328, Section 604(d), the south half of Sec. 13 in T22N, R11E (320 acres on Mt. Margaret), will definitely be donated to the government. Per Section 604(c), Sec. 5 in T2 1 N, R1 4E (2 5 2 acres at the north end of Lake Cle Elum), and the west half of Sec. 3 in T21N, RHE, (272 acres around Lost Lake), will probably be donated. They are all shown as remaining Plum Creek lands.

Two small parcels shown as being in "Other Ownership" on Figures I and 1A are shown as being in national forest on the 1996 Cle Elum Ranger District map. They are about 120 acres in the northwest corner of Sec. 31 in T22N, R11E (Tinkham Peak) and 40 acres in the southwest corner of Sec. 10 of T21N, R12E (Foot of Lake Keechelus). There may be other discrepancies, but they are not important enough to list.

Table 1, attached, lists the Plum Creek lands that may or may not be deleted from the exchange in order to balance the appraisal values. The numbers in Figure 1-B identify the sequence in which they would be deleted. Note that some of the lands shown on the map as remaining in Plum Creek ownership have a higher sequence number than lands shown being traded to the Forest Service. In other words, some of those lands shown as remaining in Plum Creek ownership would actually be more likely to be traded than lands shown being traded.

Services' Response: The Services agree that the situation remains "fluid." The Services will add such a description in the FSEIS. Because it is fluid, various documents will contain some apparent discrepancies until exact lands are settled. See response to Forest Service comment #1 (B.I, 1) and response to ALPS comment #7 below.

- 7. Comments regarding Errors on Landscape Map:** Figure 10A contains almost too many errors to list. They can easily be seen by comparing this map with Figures 1/A and the classification map inserted in the back of the 1-90 Exchange DEIS. Most of them assign AMA, LSR or Matrix classifications to lands that actually fall under "Other NWFP Classifications"

We believe "Other NWFP Classifications" itself should be divided into at least two classifications:

- Congressionally/Administratively Withdrawn
- Other Ownerships.

Here is why this division is so important. Withdrawn areas (wilderness, recreation areas, etc.,) almost always have more restrictions on use than do the NWFP classifications. On the other hand, other privately owned lands have much fewer restrictions. Lands owned by other public agencies will probably have restrictions that fall somewhere between Plum Creek's HCP and those for federally withdrawn areas. (The Washington State Department of Natural Resources has developed its own HCP and the city of Seattle is currently writing one for its Cedar River Watershed.)

Figure 10A also shows the area on the north side of Kelly Butte to be either Plum Creek owned or Forest Service Matrix. However, Section 611 of HR 4328 creates the "Kelly Butte Special Management Area" when the exchange is completed. Roads and commercial timber harvests will be prohibited, so it will definitely not be Matrix. This area should therefore be shown as "Congressionally/Administratively Withdrawn" on the map. The outline of the area is also presented in the attached markup of Figure 10A.

We have attached Table 11 listing those errors we found as well as a marked-up map of Figure 10A. Correcting the map and substituting the two classifications will give a much more accurate picture of habitat maintenance/restoration in the HCP area. Note that we did make that separation of the "Other NWFP Classifications" areas shown on the map for Table 11, but not for Figure 10A.

Services' Response: The Services appreciate the assistance of ALPS in detecting these errors and their diligence in preparing their comments in a format that allows them to be readily corrected. The corrections will be made.

- 8. Comments related to Subbasins and Counties:** The draft *Description and Analysis of Modifications to Plum Creek Timber Company's Cascades Habitat Conservation Plan* states on pages 1 and 8 that the Plum Creek and Forest Service ownerships in the Yakima and Green River Subbasins will be the same as their respective ownerships in Kittitas and King Counties. These statements are both hard to visualize and misleading.

First of all, these statements should be preceded by the phrase, "Within the HCP planning area," to make it clear that you are referring only to the planning area and not to the entire county.

Second, the statements are wrong as they apply to King County and the Green River. The King County portion of the planning area also contains the Snoqualmie River Subbasin in the northwest corner and the Cedar River Subbasin just to the south. Plum Creek will pull out of the Snoqualmie with the exchange, while the Forest Service will retain substantial ownership there. Ownership lines go back and forth across the Cedar River watershed boundary.

Services' Response: These statements were not meant to be absolute. There are minor assets of Plum Creek land in King County outside the Green River in the Snoqualmie River Basin and some small portions of the Planning Area within the Snoqualmie River and Cedar River Basins. Appropriate changes have been made in the text.

- 9. Comments related to Errors in Tables:** We have found the following errors in Table 4A, page 34. Late-Successional Reserves in USFS ownership should be 66,505 acres, not 4,505 acres. Adaptive Management Areas in Plum Creek ownership should be 37,556 acres, not 87,556 acres. Matrix lands under Plum Creek ownership should be 27.9%, not 22.9%.

Services' Response: The above referenced errors have been corrected in Table 4A. Note, as a result of Forest Service comments the Services are now using the term "interspersed."

- 10. Comment on Stream-mile Errors:** There was some confusion between Tables 27A and 28A regarding the miles of stream owned by Plum Creek. The text in Section 2.4.1, page 24, refers to both tables, but only subtly distinguishes between them. It was only at the January 21 meeting that we realized that Table 27A lists only the stream miles within the NWFP area (which does not include the northwest corner of the HCP area) while Table 28A lists all the stream miles within the entire HCP area. This distinction needs to be emphasized more strongly.

Services' Response: Thank you for your input. We agree with your comment and Plum Creek has made changes to Section 2.4.1 in the HCP Modification document to clarify the contents of Tables 27A and 28A. Briefly, Table 27A refers only to DNR Type streams in one of three categories designated in the NWFP (AMA, LSR, or Matrix) in the HCP Planning Area, on Plum Creek's lands. All stream miles shown in Table 27A will be managed in accordance with Plum Creek's Riparian Management Strategy (see HCP Section 3.3). Table 28A refers to the miles of DNR Type streams within each ownership in the HCP Planning Area and the corresponding riparian management strategy that will apply to the streams in each ownership.

F. SIERRA CLUB — CASCADE CHAPTER

- 1. Comment on Modifications and Amendments:** We have reviewed the documents regarding Plum Creek's request for an amendment to their Habitat Conservation Plan in the Central Cascades, that will reflect the I-90 Land Exchange with the Forest Service. This is actually the fourth amendment. Apparently USFWS believes the other three were not worth actively seeking public input (such as adding Bull Trout to the Incidental Take permit) as nothing was sent to those of us who commented on the HCP.

Services' Response: Minor modifications to the HCP have been completed and are listed in these documents (See response to comment 46 in Muckleshoot Indian Tribe Letter). They were completed in accordance with the Implementation Agreement whereby the parties exchanged letters regarding such modifications and these are made part of the official record. These minor modifications include modification to seasonal protections for spotted owls and northern goshawks, site management plans for bald eagles, clarification of measures for talus slopes, modification to the timing of aquatic monitoring and watershed analysis schedule, clarification of inclusion of Plum Creek timber harvest rights on City of Tacoma lands, modification to the reporting timeframe changing the submission of the first report to "no later than December 31, 1999." The latest modification to be processed is the subject modification of the land base as a result of the I-90 Land Exchange.

With respect to the addition of Columbia River bull trout to Plum Creek's Incidental Take Permit, notification was published in the Federal Register on May 4, 1998 (63 FR 24565). A biological opinion and a Set of Findings were completed. The Set of Findings addressed the comments received on that proposed action. Columbia River bull trout were listed on Friday, July 10, 1998. Columbia River bull trout were added to the incidental take permit consistent with the Implementation Agreement on Tuesday, July 14, 1998.

- 2. Comment on Routine Matter:** While the USFWS and NMFS are treating this as a routine matter, we believe it is an opportunity to fix the flaws in the original HCP. All the problems we outlined in the original HCP are still there. We refer you to our extensive comments submitted at that time. We offer these comments on the documents and proposed amendment.

Services' Response: This is not an opportunity to change the original HCP. The Services determined that the original HCP met the issuance criteria established under Section 10 of the Act and, on that basis, a Permit was issued by the Fish and Wildlife Service on June 27, 1996. The Services also signed an Implementation Agreement containing "No Surprises" assurances. At this time we remain unaware of any problems with the HCP that need to be addressed and note that the conservation program associated with the HCP is being implemented in accordance with the IA. However, the original HCP is beyond the scope of this action. With reference to comments submitted on the original HCP at that time, we refer the reader to our responses to those comments contained in the FEIS and ROD.

- 3. Comment on HCP:** The best that can be said about this amendment is since Plum Creek will have 40,000 fewer acres, the relative impacts will be reduced. But since the underlying HCP is so weak, this adjustment does not eliminate those flaws and impacts.

Services' Response: The Services do not agree with the context of the above statement. The situation is not as simple as that statement implies. The checkerboard pattern of lands in the original HCP actually worked quite well for wildlife. The need for a land exchange greatly diminished with the signing of the HCPs for both Plum Creek and DNR with respect to these landscapes.

Not all species will benefit from this exchange. Some species, such as the grizzly bear, utilize early successional foraging habitat created by timber harvest (especially in the absence of a natural fire regime). Ungulates will be impacted by the lack of harvest within the Grizzly Bear Recovery Zone and this may impact wolves should a pack attempt to establish itself in this area. The checkerboard pattern ensured a mixture of late-seral forest throughout the Planning Area. True connectivity concerns exist in areas outside the HCP Planning Area such as those areas not considered long-term forestry lands along the Interstate 90 corridor. It is short-sighted to attempt to address connectivity on lands managed for forestry while ignoring the continued decrease in parcel size and associated development occurring along the Interstate 90 corridor.

It is clear from the make-up of the exchange that it was influenced by recreation concerns. The pressures of recreation groups created the desire for Plum Creek to depart from those particular portions of the Planning Area. Those same pressures drove the Forest Service to attempt to acquire those lands as important recreation areas. The focus on “connectivity” stated in many planning documents is a combination of misunderstandings and underestimation of the value of Plum Creek’s and DNR’s HCPs; and a lack of understanding about the true connectivity threats in this landscape.

The resulting landscape, however, is not clearly detrimental; it is a series of trade-offs. Even among suites of species (e.g., owls and salmon) the benefits are not as clear as the commentor’s statement would indicate. Marginal benefits that may be seen for both owls and salmon east of the Cascade Crest are likely off-set or partially off-set by impacts which will occur west of the Cascade Crest. While the Land Exchange is supported by some, such as recreation groups, it does not appear to be supported by the Muckleshoot Indian Tribe.

It is unclear from the comments whether or not the Commentor supports or opposes the Land Exchange. The Commentor expresses their opinion of the original HCP, and their criticism of the modification focuses on the negative impacts associated with the Land Exchange. The Services invite the Commentor to comment on the FSEIS regarding which of the alternatives their organization prefers. We were not able to ascertain from their comments whether they believe the Services should find that the modification would affect the integrity of the HCP and therefore should deny the request.

- 4. Comment on Old Growth and Owls:** This amendment reflects the Land Exchange currently being completed. Plum Creek’s land in the area drops from 170,800 to about 128,000 acres. After the exchange, about 5%, (~6,000 acres) of Plum Creek’s land in the HCP will be considered old growth of some sort. The trade reduces Plum Creek current holdings of Spotted Owl nesting, roosting and foraging habitat (NRF; 13” diameter trees and larger), by about 14,000 acres.

***Services Response:** Plum Creek currently supports about 62,000 acres of owl habitat (34,000 acres of NRF habitat), which would increase to about 74,000 acres (17,000 acres of NRF habitat) during the plan period. Following the exchange, Plum Creek will have given up significant amounts of land on the east side of the Crest where it conducts more selective harvests and will have gained lands on the west side of the Crest where even-aged management is more prevalent and rotations are generally shorter. Plum Creek will, overall, have considerably less land. Following the exchange it is expected that Plum Creek would support about 43,000 acres of owl habitat (24,000 acres of NRF) which would increase to 50,000 acres (9,500 acres of NRF) during the plan period. While the acres of habitat are clearly changing, the commitment in terms of percent of the ownership changes relatively little from what was provided prior to exchange. Changes in percent are not a result of management change, but rather reflect the differences in lands being acquired and disposed. Lands of similar tree-species*

composition and site index are treated as they were before the land exchange. The most important factor to consider is the amount of habitat which will result over time on the landscape. Currently, 196,000 acres of owl habitat exist in the 418,000-acre Planning Area. With or without the land exchange, this would increase to 223,000 acres. The amount of NRF at the end of the plan period would be 115,000 acres without the exchange, 118,000 acres with the exchange.

The Service notes that Old Growth acres are more difficult to express as a percentage because they are subject to greater rounding error than larger percentages. Currently, Plum Creek has about 3,000 acres of old growth and would be expected to have a like amount of 3,000 acres at the conclusion of the plan period. Following the land exchange, Plum Creek will still have about 3,000 acres. Additional ground verification will be necessary to more precisely identify these lands. It is expected that Plum Creek acquired old growth will undergo some decline during the plan period to about 1,500 acres. As mentioned for owl habitat, the primary determinant of impacts to wildlife will be the landscape level amounts of habitat. Currently, there are about 27,000 acres of old growth in the Planning Area. With the exchange, this would increase to about 42,000 acres in the next 50 years; without the exchange, this would increase to 41,000 acres.

- 5. Comment on Many Species and Recovery:** The Commentor stated that “Habitat for numerous listed or at risk species, including grizzly bear, gray wolf, goshawk, spotted owls, bald eagles and marbled murrelet are found on these lands. Salmonids are found in the streams including kokanee and steelhead. Amphibians and invertebrates are found throughout these lands, though their range, habitats and demographics are not well understood. This calls for a greater effort on the part of the Services to craft an HCP that truly contributes to recovery of these species.”

Services’ Response: *The Services agrees that an HCP that truly contributes to the recovery of these species was needed, and believe that Plum Creek, with the assistance of the Services, has achieved such an HCP. We do note that it is the applicant and not the Services that usually craft their HCPs.*

- 6. Comment on Failure to Consider Alternatives:** The Commentor stated that “The HCP states that ...Approve HCP Land Base Exchange and Require Additional HCP prescriptions, was eliminated from detailed analysis because any additional prescriptions would be beyond the scope of the original HCP and inconsistent with assurances guaranteed to Plum Creek under the IA and No Surprises Policy.” (2.3 Alternatives Eliminated). However, the No Surprises Policy does not amend NEPA or its regulations. The Services still have an obligation to review all reasonable alternatives, such as the one mentioned above that was eliminated without consideration. The fact that a permit applicant does not want to do a particular action is not grounds for an agency to eliminate it from consideration.”

Services’ Response: *The Services included all reasonable alternatives in the DSEIS. For detailed consideration, the Services considered unique alternatives that were within its control. The subject alternative was eliminated from consideration because the Services are bound by the “No Surprises” policy regarding whether we could demand additional mitigation at this stage. Only changes associated with the Land Exchange are warranted for the Services to insist upon. Additionally, there are some additional measures already considered in the Proposed Alternative so it would not be considered as distinctly different from the subject alternative. The need to request more mitigation is diminished by the suite of mitigation the Services received with respect to the original HCP.*

7. **Comment on Current Situation:** The HCP implicitly assumes that current situation is acceptable. It is ironic that the Services would describe the habitat situation as “favorable,” given the status, of the spotted owl and the other statements that habitat loss is the primary impact on the species. This statement makes no mention of the deplorable state of the habitat today- huge areas of once prime habitat that have been lost, and the high level of fragmentation of the remainder, except in roadless areas.

Services’ Response: Section 2.0 in Plum Creek’s HCP and 13 Technical Reports prepared by Plum Creek in support of its HCP discuss in detail the baseline or current environmental conditions in the HCP Planning Area. The EIS for Plum Creek’s HCP, prepared by the Services, describes the Affected Environment. For the purpose of NEPA analysis, the Affected Environment section of the EIS described the baseline conditions in the HCP Planning Area to enable a comparison of the differing levels of effect that would result under all action alternatives considered in the HCP. The Biological Opinion, prepared by the Fish and Wildlife Service, regarding Plum Creek’s HCP, thoroughly discusses the environmental baseline in the HCP Planning Area, and it also addresses the baseline landscape surrounding the HCP Planning Area. The Unlisted Species Assessment for anadromous salmonids, prepared by the National Marine Fisheries Service, to determine the effects of implementation of Plum Creek’s HCP on unlisted species of fish provides an environmental baseline of various habitats in the Planning Area. However, no where in any of these descriptions do the documents assert, as the Commentor does, that any combination of habitat that approximates current levels in the Planning Area is “adequate,” “acceptable,” or “favorable.”

8. **Comment on Spotted Owl Habitat:** Spotted owl NRF habitat will drop, over the first 20 years. The Services expect owls to decrease from 87 pairs to 82 in first half, then increase to 91 pairs. But then, the HCP states, “If monitoring indicates that fewer than 80 percent of the predicted owl sites exist, the deferral strategy will be adjusted.” (p 4-20). Not only is this a substantial further reduction in owl populations, no increase in habitat is even requested, no matter how dire the situation becomes, thanks to the scientifically bankrupt no surprises policy. We continue to be amazed at the Services’ approval of HCPs with known, significant and deliberate reductions in endangered species.

Services’ Response: The Services note that, while Plum Creek has received a permit to take owls, few additional impacts are expected beyond what would have been allowed without the permit. However, a number of substantial benefits would not have occurred without the HCP.

9. **Comment on Spotted Owl Impacts:** The Commentor states that “We agree that “The principle form of impact is displacement of, spotted owls due to modification of owl habitat...” (p 4-19), but then the Services assume that regrowing trees will increase habitat. This discussion of percentages of habitat for owls (2.3.3 Impacts) counts heavily on NF lands and even more so with the land exchange. The HCP states, ‘Effects of forest-management activities in the Planning Area may impact the spotted owl by: (1) direct killing or injury of owls, (2) disturbing actively nesting owl pairs within the nesting area, (3) reducing suitable habitat within the home range of a nesting pair, and (4) reducing dispersal habitat for adult and juvenile owls for travel within and between areas containing suitable habitat.’ (p 4-19). Why is reducing suitable habitat for a single owl not considered an[d] effect? Why is disturbing a nesting pair away, from the nesting area not an effect?

Services’ Response: The Services note that these are impacts and that they were addressed in the DSEIS. Item 2 includes impacts related to disturbing nesting owls. Reduction of suitable habitat for a single owl is addressed in item 4 as well as the third sentence following the cited text, which states “The principal expected form of impact is displacement of spotted owls due to modifications of owl habitat, including areas with nest sites.”

10. Comment on Relationship to NWFP: The HCP relies heavily on the adjacent national forest land (238,000 acres) to provide sufficient habitat for old-growth dependent species. Predictably, the HCP states, “Due to the favorable distribution of suitable habitat on Plum Creek lands and on adjacent National Forest lands, no significant net loss of [spotted owl] habitat is anticipated, measured over the HCP period, because habitat will be replaced through, growth of younger forest stands on both Plum Creek and National Forest lands.” (4-19) This, transfer of mitigation responsibility from Plum Creek to the public should not be accepted. Plum Creek should mitigate for its actions on its own lands.

Services’ Response: As stated earlier, the HCP does NOT rely on National Forest Lands or any other lands for mitigation. All HCPs must rely on their own minimization and mitigation measures. Those conservation measures should be commensurate with the impacts to result from the covered actions. In determining the impacts, it is often necessary to examine the landscape context. The Services use information such as whether the habitat or individuals to be “taken” are isolated far from the nearest breeding sites or other suitable habitat. We look at the impacts to the population and we look at landscape factors. In Plum Creek’s case we looked at the impacts of its actions, but in the context of the NWFP. If the limited harvests proposed by Plum Creek can be conducted without significantly decreasing the amount of habitat available to spotted owls, then there is a much lower level of impact, which requires a lower level of mitigation.

11. Comment on Owl Habitat: The HCP states, “The increase in total owl habitat is due to two major factors: (1) forest in-growth following historical harvest on all ownership’s [sic] which will develop into FD habitat; and (2) a substantial reduction in the harvesting of NRF and FD habitat on Federal lands.” (4-19). We note that the in-growth is for “historical” harvest, not future Plum Creek logging. On Plum Creek lands more than 11,000 acres of potential spotted owl NRF habitat (MF, MOG, OG) would be logged in the first 20 years. The impact is compounded by fragmentation of remaining habitat.

Services’ Response: A third factor that was perhaps not clear, is that harvests conducted by Plum Creek using its innovative silvicultural techniques, which retain FD habitat or hasten the development of FD or NRF habitat characteristics, contribute to the habitat increase as well. No where in the HCP does it specify how much habitat is harvested, instead it focuses on commitments as to how much habitat remains at each point in time. This is the factor to which the owls will respond.

Regarding fragmentation, the effects of fragmentation (i.e., creation of islands) require a “hostile sea” in order for the habitat parcels to be considered as true “islands.” With this in mind, the Services note that the amount of owl habitat increases with time. Also, the amount of owl habitat develops to levels greater than most landscape studies consider as providing adequate percolation across the landscape. Additionally, the Resource Selection Probability Function model accounted for “fragmentation” in its calculations and only relied on the amount of nesting habitat. This exclusion of foraging/dispersal habitat with consideration of “fragmentation” made the output of this model a truly worst-case scenario. Additionally, the landscape-level data fed into the model used a random distribution of harvests, which is further considered a worst-case scenario with respect to “fragmentation.”

Additionally, these comments were addressed on FEIS pages A-51 and 52, and A 63-68; and ROD pages 49, 53, and 54.

- 12. Comment on Assumptions:** The model assumes that there will be no logging on national forest lands in the Snoqualmie Pass Adaptive Management Area, Late-Successional Reserves and the Matrix. (2.2.3 New Forest Service Assumptions). We know from experience the Forest Service has proposed and continues to plan for logging within these type of designation. In fact, the Forest Service includes the Matrix in its probable sale quantity. The HCP blithely assumes that any such logging will be beneficial for wildlife and states, “This approach understated the habitat which would result from habitat enhancement activities.” We do not agree. Since these are all very experimental management regimes, they should not get credit for improved habitat until there is substantial evidence documenting such improvement in the area under question. In fact, the model overstates the late-successional habitats by assuming no logging in the LSRs, SPAMA and Matrix.

The new Forest Inventory Polygons (replacing Management Units) range from, 1 -612 acres (except talus), but the old system had a maximum of 110 acres. Is talus only area where the new model is less accurate?

Services’ Response: *Regarding harvest assumptions on Federal lands, see response to Forest Service Comment 38 Harvest Assumptions (B.II, 38). The Services note the intention of the Forest Service under NWFP and concurred with assumptions for modeling purposes. Regarding polygons and talus, talus is the only analysis area that had to be adjusted due to the change to inventory polygons from management units.*

- 13. Comment on Fire:** The models do not factor in any loss of habitat due to fire, wind or other natural events. Since these will certainly occur over 50 years, the HCP overstates the habitat available. The Services also offer no effective method of offsetting such losses, if Plum Creek has already logged most of their owl habitat. Again, Plum Creek receives the certainty and the public’s wildlife take the risks.

Services’ Response: *Forest-health issues and Unforeseen and Extraordinary Circumstances are adequately addressed in the HCP FEIS. In addition, Section 8.0 of the HCP’s Implementation Agreement describes the process that Plum Creek and Services will follow if unforeseen or extraordinary circumstances arise. These provisions include revising the HCP or safe-harbor baseline, and may require further mitigation from Plum Creek to avoid appreciably reducing the likelihood of survival of the affected species in the wild. This standard is essentially the same as that contemplated in Section 7(a)(2) and 10(a)(2)(B)(iv) of the ESA. Also, the Services may require additional mitigation for species under Extraordinary Circumstances (a substantial and material adverse change in the status of a population), within limits of the No Surprises policy.*

During the development of the HCP, Plum Creek and Services consulted with silviculturists and forest health/fire ecology experts. Based on these consultations, it was determined that modeling to “simulate” catastrophic forest disturbances would not be productive because effects to wildlife would differ dramatically depending upon when and where disturbances were modeled to “occur.” For instance, a fire in Matrix areas within the HCP Planning Area would have a different impact on spotted owls and other wildlife habitat than a large-scale fire or windthrow event in an LSR. Large-scale natural disturbances like fire is considered either an “Extraordinary” or “Unforeseen” circumstance, which would trigger corrective actions as specified in the HCP’s Implementation Agreement. The Services note that the HCP Planning Area is not at any particularly high risk of windthrow such as occurs during intense storm events on the Olympic Peninsula.

With regard to the timing of stochastic events, the Services note that Plum Creek accepts the risk of loss early in the Permit period should such natural disturbances occur. There is no provision in the HCP or Implementation Agreement relieving Plum Creek of its duty to mitigate should timber, otherwise available for harvest, be destroyed by fire or windthrow.

- 14. Comment on Spotted Owl Mitigation:** Several changes to the mitigation measures are proposed: Spotted owl habitat changed from 8 to 6 percent of PCTC lands. (1.5.1).

Services' Response: See response to Sierra Club comment 4.

- 15. Comment on Marbled Murrelet Surveys:** Additional murrelet surveys will be performed on lands considered by USFWS to be habitat (1.5.2). Does this include Sawmill Creek?

Services' Response: The Service is still in the process of accumulating data regarding potential habitats that will allow it to decide which exact parcels are likely to contain murrelets and which are unlikely. All stands, which are not unlikely to contain murrelets, will be surveyed to protocol. Regarding specific habitat, the Service has not finalized its decision in this regard, but do note that, in the vicinity of Sawmill Creek, the distribution of potential habitat along riparian areas and surrounding surveys already completed make it very unlikely that any take would occur even if these stands were not surveyed and harvested.

- 16. Comment on Watershed Analysis Schedule:** Watershed analyses are now to be completed within ten years, not five. (2.5.4)..

Services' Response: This change was completed through a minor modification prior to the proposed action. See response to Muckleshoot Indian Tribe comment 2 (C.I, 2).

- 17. Comment on Owl Validation Surveys:** Changes to monitoring requirements include changing model validation surveys to be conducted in "X" percent of the planning area. (2.6) What does this mean?

Services' Response: The "X" was erroneously left in from a previous draft. The model validation surveys will still cover 10 to 15 percent of the Planning Area. A comparison of the maps of monitoring areas will indicate that one area becoming primarily Federal land is proposed for discontinuation while all other areas including those in the Green River will be enlarged.

- 18. Comment on Timing of Murrelet Surveys:** Surveys of potential murrelet habitat will now be completed prior to harvest rather than in first year of HCP. Thus, data on actual occupancy will not be available to inform decisions about this HCP and other management plans.

Services' Response: Whether the surveys are completed in the first or second year post-decision is not relevant. In the original HCP, surveys were not completed until after issuance of the permit. Presently, the information regarding occupancy on lands to be acquired by Plum Creek is not available. What is available is the lack of "detections" during surveys completed to date in the Green River Basin, the selection by the Fish and Wildlife Service of parcels to be surveyed, and the Service's ability to determine the protocol to be used. Additionally, the fact that occupied sites discovered during such surveys will be protected is also established. The Fish and Wildlife Service believes these are the most-relevant pieces of information needed regarding its decision at this time.

19. Comment on No Surprises: Secretary Babbitt's No Surprises Policy is, one of the most insidious aspects of this HCP. None of the proposed changes to the HCP will actually increase Plum Creek's commitment to habitat protection over that in the original HCP signed in 1996. While Plum Creek gets iron-clad certainty, the public's wildlife take the risks.

Services' Response: The No Surprises policy was codified into the Code of Federal Regulations effective March 25, 1998 (63 FR 8859; February 23, 1998, Federal Register). Every HCP completed will receive the No Surprises assurances whether they are explicitly stated in the Implementation Agreement or not, so long as the HCP is being properly implemented and the species at issue was adequately covered by the HCP.

However, this is not a new concept. The very first HCP, after which the section 10 provisions (1982 ESA amendments) were modeled after, was the San Bruno Mountain HCP completed in 1983. That HCP contained assurances similar to "No Surprises" in its' Implementation Agreement. In addition, the "No Surprises" policy is consistent with congressional intent. The conference language (House Conf. Rpt. 97-835) associated with the 1982 amendments to the ESA, which provided the ability to non-Federal entities to receive an incidental take permit, stated "The Committee intends that the Secretary may utilize this provision to approve conservation plans which provide long-term commitments regarding the conservation of listed as well as unlisted species and long-term assurances to the proponent of the conservation plan that the terms of the plan will be adhered to and that further mitigation requirements will only be imposed in accordance with the terms of the plan. In the event that an unlisted species addressed in an approved conservation plan is subsequently listed pursuant to the Act, no further mitigation requirements should be imposed if the conservation plan addressed the conservation of the species and its habitat as if the species were listed pursuant to the Act." [Emphasis added.]

In addition to this clear direction by Congress, there also exists the common-sense interpretation, which is reflected in the words made common with the advent of the No Surprises policy: "A deal is a deal." The Services do not view this as a concept originated by either the No Surprises policy or regulations. The Services have always viewed agreements made with other entities in the context that the Services would uphold their end of such agreements and honor their commitments.

Such a policy is a necessary incentive for nonfederal entities to enter into agreements where they provide substantial conservation from the outset. If it were not for such a policy, far fewer HCPs would have been completed and far fewer acres would be subject to the enhanced conservation that they currently enjoy. Rather than additional risk, this policy has resulted in benefits to the species.

With regard to the proposed modification of the HCP, the intent of this proposal is to change the land base and make other minor, yet connected, changes. It is not the purpose of this proposed action to increase the commitment for conservation measures from the Company beyond the already sufficient level provided in the HCP.

20. Comment on Stream Buffers: There are no stream buffers on the more than 900 miles of intermittent streams (those that don't run year round) except where they have a steep and unstable "inner gorge". How does this and other buffers compare to proposed revisions, to state forest practice's regulations currently under consideration. It would be ironic if this much touted HCP ended with less protection than state law.

Services' Response: The statement about buffering of "intermittent" streams is inaccurate. First, streams which are spatially intermittent but have perennial subsurface flow are buffered as perennial streams. Seasonal streams within inner gorges are buffered. As stated earlier this does not mean that streams outside inner gorges are necessarily unbuffered. A number of other factors must be considered. Some seasonal streams contain fish and will therefore be buffered as fish-bearing streams with 200-foot buffers. The distribution of upland leave trees along seasonal streams is a common practice for logistical purposes. Watershed analysis may also provide additional prescriptions (See Muckleshoot Indian Tribe comments 1a and 84 [C.I, 1a; and C.II, 84]). Also, one must consider the context. With longer rotations and considerable use of uneven-aged management, a relatively small amount of seasonal streams would be subject to direct effects of harvest units during the first few decades following such harvest. The exact number or miles of seasonal streams are difficult to quantify. On one hand, many of such streams remain to be identified; on the other hand, many such streams upon closer examination are perennial or fish-bearing.

21. Comment on Species Analysis: The HCP, still relies on lumping over 270 species into 16 "life forms," where their "primary" and "secondary" habitats were modeled. As stated in our comments on the original HCP, we find these to be crude and not appropriate for a 50 year plan with the no surprises policy on top of that.

Services' Response: The Services acknowledge that the lifeform analysis continues to be used as a foundation for the majority of the species covered by this plan. In reality, there are 20 lifeforms, which represent the species covered. Compared to other attempts at guilding, we find the approach Plum Creek used to be quite elegant. The technical papers prepared to support the HCP include a paper on special emphasis species and another, which uses a wildlife matrix to link species with habitat attributes in support of the categorization by lifeform. Furthermore, while the HCP already addressed a number of species specifically, the Services' Unlisted Species Assessment looked at 58 species individually and the Services Biological Opinion addressed 6 species, NMFS looked at 3 additional species in their unlisted species assessment. Therefore, 67 of the over 317 identified species have been addressed in additional specific detail. Furthermore, prior to addition of any such species to the Permit, a Biological Opinion will be prepared which specifically identifies the needs of and impacts to the species.

22. Comment on HCP Boundaries: The HCP still leaves out key low elevation lands that Plum Creek plans to sell for development, while leaving in huge areas of national forest land, miles from Plum Creek's land.

Services' Response: The HCP Planning Area includes those lands that the Growth Management Act identified as being managed for long-term forestry. All National Forest Lands included within the Planning Area boundary are in close proximity to currently covered lands. The Planning Area was also addressed earlier.

23. Comment on Specific Lands: The land exchange rearranges the current checkerboard, ownership in Sawmill Creek valley in the Green River watershed. Much of the valley is in the Kelly Butte roadless area, though some large chunks have been logged by Plum Creek. The resulting land ownership will make all of the valley west of the creek NF lands (and part of the Congressionally designated Kelly Butte Special Management Area, off limits to roads, logging, mining and ORVs). Most of the valley east of the creek will be owned by Plum Creek.

Most of the area is younger forest resulting from fires (primarily since the railroad was built in the 1880s). But there is a finger of old-growth forest (almost 500 years-old) that runs along a mile or so of the stream. This is one of the few stands of old growth forest left in the watershed. After the land exchange, part will remain on NF lands, but much of it is in sections 30 and 31 will be owned by Plum Creek. This could be a very suitable nesting habitat for marbled murrelets outside Zone 1, as well as nesting habitat for spotted owls. Here, is an example of where existing NRF habitat on NF lands will now be logged due to the land exchange. This is a place where additional habitat protection is essential.

The stream contains salmonids, potentially including steelhead and other anadromous species that are being reintroduced above the dam by the Muckleshoot Indian Tribe. At a minimum, the riparian standards should be increased to the FEMAT standards of no cut for 300'. We note that, Plum Creek has plans to punch roads, into this part of the valley very near the creek (see easement requests from FS).

Similar situations occur in Champion and Wolf Creeks. McCain Creek north of the river also deserves, extra attention. The Green River watershed is so heavily impacted by past logging and road building, it must receive better treatment than that proposed in the HCP.

***Services' Response:** The Services note the historic logging that occurred prior to acquisition by Plum Creek in 1989. We also note there is no current roadless designation by Forest Service in this area. With implementation of the land exchange, the Kelly Butte Special Management Area will be established. Plum Creek will manage their lands in the Sawmill Creek area in accordance with State Forest Practice Rules and Regulations, the HCP, and their Environmental Principles. Because Sawmill Creek is a fish-bearing stream, it will get 200-foot RHAs measured horizontally. As a result of steep side slopes, the outer buffer edge will be almost 300 feet up the slope.*

Plum Creek requested eight easements across Forest Service lands from the Mt. Baker-Snoqualmie National Forest. Six of the easements are no longer required as a result of the land exchange. Of the remaining two easement requests, one was denied and only one was granted.

Regarding Baseline conditions, see Sierra Club comments #7 and 11, and Muckleshoot Indian Tribe comment #36 (C.I, 36).

24. Comment on Documents: The HCP continues to display all the habitat data as percentages of land. It is crucial to see the actual amount of land in acres to understand the impacts of the decisions. The documents did not include a map showing habitats between 1996 (46A) and 2045 (48A). Clearly, the location and fragmentation of habitat in the first two decades is a key piece of information to evaluate this amendment, especially since the proposal would reduce spotted owl habitat over that first two decades. Recent logging (1997 and 1998) has impacted the lands in question, but are not shown in the maps.

The maps need to be updated to reflect the actual lands to be traded. The designations on federal lands contains errors, and it does not show underlying roadless area protective designations that underlay the NW Forest Plan designations.

This amendment should provide:

- increases in riparian buffers' on all streams
- Protection of all old-growth forest in Sawmill Creek
- No reduction in spotted owl nesting habitat or populations.
- No reduction in marbled murrelet nesting habitat

Services' Response: The Services believe that percentages are more useful to visualize impacts in a relative manner than are gross acres. The FSEIS will include maps for an intermediate decade as was done in the original HCP.

The 1997 and 1998 harvests on Plum Creek lands are in the process of being digitized and entered into the Company inventory files. This activity will be reflected in the report made to the Services at the end of 1999.

Regarding the comment about using actual lands to be traded, the DSEIS evaluated the HCP modifications submitted by the Permittee. See response to comment 1 in Muckleshoot Indian Tribe letter (C.I, 1).

The HCP modification addresses those aspects of the HCP which need to be refined as a result of the land exchange. An increase in riparian buffers is not warranted at this time. It is clear from the commentor's statistics that he is not following the definitions of old growth contained in the HCP. Sawmill Creek and mature forest within that subbasin will be treated as will other lands acquired or retained in this land exchange. Examination of aerial photos will reveal most older forest will fall within RHAs for fish-bearing streams. With respect to marbled murrelets, the survey protocols should ensure that there is no reduction in occupied murrelet nesting habitat. The HCP also ameliorates potential declines in spotted owls through the use of deferrals and foraging habitat.

25. Comment on Safeguards: This Commentor alluded that the Services failed to equip the HCP with sufficient safe guards in the face of incredible uncertainty. He further indicates that cost and logistics were considerations.

Services Response: The Services disagree. We believe the HCP offers far greater predictability than would have occurred without the HCP. The Services have a number of remedies available to them that were addressed specifically in the original Biological Opinion for the original HCP. Specifically, the Service outlined each of the steps we could take depending on level of severity or urgency. "In the event that a change to the HCP is deemed desirable or necessary by the Services, they will have the following opportunities to effect change (presented in hierarchical order of urgency):

- 1. Request Plum Creek to avail itself of the HCP flexibility.*
- 2. Utilize, where applicable, the provisions for consultation with the Services.*
- 3. Utilize, where applicable, the adaptive-management process.*
- 4. Propose either minor changes or material amendments.*
- 5. Seek additional mitigation from nearby Federal lands.*
- 6. Require re-distribution of conservation measures as a result of extraordinary circumstances [substantial and material adverse change in the status of a population].*
- 7. Terminate permit with respect to that species, where necessary, to avoid appreciably reducing the likelihood of survival and recovery of the species in the wild."*

G. MOUNTAINEERS

- 1. Comment on Original HCP:** The Mountaineers welcome this opportunity to once again submit written comment on the Plum Creek Habitat Conservation Plan and Incidental Take Permit under the Endangered Species Act, pursuant to an amendment to that plan as a result of the land exchange with the US Forest Service. This amendment presents the Fish and Wildlife Service with a splendid opportunity to strengthen the plan as originally conceived.

Services' Response: The Services determined that the original HCP met the issuance criteria established under Section 10 of the Act and, on that basis, a Permit was issued by the Fish and Wildlife Service on June 27, 1996. At this time we remain unaware of any problems with the HCP that need to be addressed and note that the conservation program associated with the HCP is being implemented in accordance with the IA. However, this modification does not offer an opportunity to change the terms of the original incidental take permit and Implementation Agreement, and the original HCP is beyond the scope of this action.

- 2. Comment on Mountaineers Involvement:** The Mountaineers are the oldest, and one of the largest conservation and outdoor recreation organizations in Washington State. Many of our 15,000 members use the lands in and around the Plum Creek HCP/land exchange extensively for recreational reasons. We have an intense interest in the areas affected by the HCP/ITP, and it is for reasons such as these that we commented extensively on the Plum Creek HCP as originally conceived and adopted, and subsequently played an active role in the consummation of the land exchange.

Services' Response: The Services note the involvement and interests of the Mountaineers in the conservation of this important area.

- 3. Comment on Responsiveness:** We regret the failure of the USFWS (hereinafter referred to as "the Service") to respond more proactively to the comments submitted not only by ourselves but our sister conservation organizations in so far as the original HCP was concerned, and respectfully request the Service to prove more responsive upon this second occasion.

Services' Response: The Services have responded fully to all comments received to date and will continue to do so. We note that responses to comments by their very nature are reactive rather than proactive. The Services confirm that we will remain as responsive as possible within the scope of this modification, just as we were in the development of the original HCP.

- 4. Comment on Original HCP Responses to Comments:** We note with concern that the HCP, as amended, still does not appear to have responded to these comments, which we incorporate, here, by reference and which appear below in summarized form.

Services' Response: The Services note that there is a large difference between responding to comments and incorporating comments (suggested modifications) into a plan. Comments, which are not feasible for incorporation into a plan are not ignored, but the reasons such comments do not result in changes are thoroughly explained within decision documents such as this. The Services incorporate by reference our response to comments in the FEIS and ROD.

5. **Comment on No Surprises Litigation:** We note that the Service is still adhering to the “No Surprises” policy as its cornerstone for this HCP. The depth of our concern with this policy is not only manifest throughout our prior comments, on this particular HCP/ITP, but in our participation as plaintiffs in litigation against the Service over its use of that Policy, nationwide.

Services’ Response: The Services have already responded to similar comments earlier in this document. Whether the “No Surprises Policy” is insidious or not is outside the scope of the EIS; the EIS is a forum for examining the environmental effects of approving this permit modification, not a forum for public policy debate.

6. **Comment on Old Growth:** The land exchange with the Forest Service will reduce Plum Creek holdings affected by the HCP by approximately 40,000, with old growth reduced from approximately 20,000 acres to roughly 6,000 acres, or slightly under 5% of the affected area. Notwithstanding this reduction, the HCP still permits a sharp drop in the reservoir of old growth during the early years of the plan, assuming that second growth will take up the slack for this diminution in spotted owl and marbled murrelet nesting, roosting again reiterate our concern with this rapid reduction of old growth habitat and our skepticism of the confidence displayed by the USFWS that second growth will provide a proxy for it in a timely and biologically suitable fashion.

Services’ Response: See responses to comments 4, 8, 9, 10, and 11 in Sierra Club letter (F, 8, 9, 10, and 11). Also, note that Old Growth (defined as stands over 200 years of age) does not decrease significantly in original HCP or post-exchange.

7. **Comment on Fire and Wind:** We also note with some alarm that once again the Service has failed to take into account loss of habitat from fire, wind or other natural disasters. There is no effective method of offsetting such habitat losses, especially coincident with the aforementioned sharp reduction in old growth, should they occur. We note, with some irony, these comments are submitted following a protracted and unusually intense period of windstorm activity in Western Washington.

Services’ Response: The Services and Plum Creek consulted leading experts in the field of fire ecology who instructed us that the amount, location, or timing of fire in landscapes such as the planning area could not be modeled. The HCP, by its silence on the subject of contingency plans, actually shares the risk equally. Early in the planning period, loss of late-seral habitat would come at the expense of Plum Creek. Later in the Planning Area, loss of such habitat would come as a combined expense to the Services and Plum Creek. The habitat amount commitments for Plum Creek are commitments, fire would substitute for harvest leaving Plum Creek having to maintain late-seral forest while curtailing its harvest.

Regarding timing of these comments, the Service note with equal irony that the unusually intense period of windstorm activity did not result in any loss of habitat in the Planning Area. As stated earlier, the Planning Area is not particularly prone to windstorm impacts.

8. **Comment on Harvest Assumptions:** Yet, again, the Service is looking to synergies from surrounding Forest Service lands that are, in our judgment, excessively optimistic. The amended HCP assumes, for example, that there will be no logging on national forest lands in the Snoqualmie Pass Adaptive Management Area, Late-Successional Reserves and Matrix). As we know from experience the FS is proposing logging in all these areas. The HCP blithely assumes that any such logging will be beneficial for wildlife. Excessive reliance is being place upon these surrounding federal forests for old-growth dependent species.

Services’ Response: See responses to comment 38 in Forest Service letter (B.II, 38).

- 9. Comment on Seasonal Streams:** Buffers for intermittent streams are inadequately provided for, being prescribed only in the event of a steep and unstable “inner gorge.” Science calls for buffers of up to 100’ for such streams.

Services’ Response: See responses to comments 1, 7, and 19 in Muckleshoot Indian Tribe’s letter (C.I, 1, 7, and 19); and responses to comment 20 in Sierra Club letter (F, 20).

- 10. Comment on Lifeforms:** Plum Creek computer modeling is still being relied upon by the USFWS to lump over 270 species into 16 “life forms.” We believe such aggregate modeling to possess an unacceptably high degree of conjecture from a scientific perspective.

Services’ Response: See response to comment 21 in Sierra Club letter (F, 21).

- 11. Comment on HCP Boundary:** We note, also, with some chagrin that crucial lower-elevation lands highly vulnerable to conversion/development are still being omitted from the HCP.

Services’ Response: See response to comment 5 in Alpine Lakes letter (E, 5) and response to comment 22 in Sierra Club letter (F, 22).

- 12. Comment on FEMAT Buffers for Sawmill Creek:** Old growth in the Sawmill Creek valley of the Cedar River watershed should be accorded full protection on both sides of the stream. This is potential nesting habitat for both marbled murrelet and spotted owls. The riparian buffers should be increased to at least the FEMAT buffers of 300’ no cut (without decreasing habitat protection elsewhere.) Parts of the stream are inhabited by salmonids, as well.

Services’ Response: See response to comment 23 in Sierra Club letter (F, 23)

- 13. Comment on Previous Comments:** Again, we refer the USFWS to our prior comments for a more complete expansion upon many of the aforementioned subjects. We submit these, respectfully, in the hope that the Service will prove more responsive to them.

Services’ Response: The Services refers the Commentor to our complete response to earlier comments contained in the 1996 documents.

H. WASHINGTON FOREST LAW CENTER

1. **Comment on Original HCP:** I am writing regarding Plum Creek's request to amend its HCP to reflect the I-90 land exchange. It is my understanding that, although smaller by approximately 40,000 acres, several problems with the HCP still exist.

Services' Response: The Services determined that the original HCP met the issuance criteria established under Section 10 of the Act and, on that basis, a Permit was issued by the Fish and Wildlife Service on June 27, 1996. At this time we remain unaware of any problems with the HCP that need to be addressed and note that the conservation program associated with the HCP is being implemented in accordance with the IA. However, the original HCP is beyond the scope of this action.

2. **Comment on Loss of Spotted Owl and Marbled Murrelet Habitat:** We cannot afford any reduction in nesting habitat or population levels of these species. The current HCP allows an unacceptable decline to occur over time.

Services' Response: See response to Muckleshoot Indian Tribe's comment 36 (C.I, 36) and responses to comments 7, 8, 9, 10, and 11 in Sierra Club letter (F, 7, 8, 9, and 10).

3. **Comment on Fire:** The models used do not factor in any loss of habitat due to fire, wind or other natural events. Since these are assured over 50 years, the HCP overstates the habitat available. It also has no effective method of offsetting such losses if Plum Creek has already logged most of its owl habitat.

Services' Response: See responses to comment 13 in Sierra Club letter (F, 13) and to comment 7 in Mountaineer's letter (G, 7).

4. **Comment on Assumption of No Logging on National Forest Lands:** The model assumes that there will be no logging on national forest lands in the Snoqualmie Pass Adaptive Management Area, Late-Successional Reserves, and the Matrix. However, the Forest Service is proposing logging in all of these areas.

Services' Response: See response to comment 38 in Forest Service letter (B.II, 38).

5. **Comment on "No Surprises" Still Controls:** Secretary Babbitt's "no surprises" policy is one of the most insidious aspects of this HCP. None of the changes to the HCP will increase Plum Creek's commitment to habitat Protection. While Plum Creek gets iron-clad certainty, the public's wildlife take the risks.

Services' Response: See response to comment 19 in Sierra Club letter (F, 19).

6. **Comment on Stream Buffers:** There is no doubt that increases in riparian buffers on all streams are desperately needed. In addition, the HCP currently has no stream buffers on intermittent streams except where they have a steep and unstable "inner gorge."

Services' Response: See responses to comments 26, 35, 36, 50, 53, 57, 61, 63, 67, 70, 81, 84, 86, and 87 in Muckleshoot Indian Tribe's letter (C.I, 26, 35, 36, 50, 53, 57, 61, 63, 67, 70, and C.II, 81, 84, and 86); response to comment 2 in Alpine Lakes letter (E, 2); and response to comment 20 in Sierra Club letter (F, 20).

7. **Comment on Species Analysis:** The HCP still relies on a model that divided over 270 species into 16 “life forms,” and found that “primary” and “secondary” habitats were in fine shape over 50 years of logging. This type of analysis is unacceptable in light of the scientific modeling that we have available today.

Services’ Response: See response to comment 21 in Sierra Club letter (F, 21).

8. **Comment on Mitigation Assistance:** The HCP relies heavily on the adjacent national forest land to provide sufficient habitat for old growth-dependent species. This transfer of mitigation responsibility from Plum Creek to the public should not be accepted; rather, Plum Creek should mitigate for its actions on its lands.

Services’ Response: See responses to comments 8, 9, 10, and 11 in Sierra Club letter (F, 8, 9, 10, and 11).

9. **Comment on Planning Area Boundaries:** The HCP still leaves out key low elevation lands that Plum Creek plans to sell for development.

Services’ Response: See response to comment 5 in Alpine Lakes letter (E, 5) and response to comment 22 in Sierra Club letter (F, 22).

10. **Comment on Adequacy of Sawmill Creek Protection:** We desperately need full protection of the old-growth forest along both sides of Sawmill Creek. This is potential nesting habitat for both marbled murrelets and spotted owls. In addition, parts of the stream are inhabited by salmonids, and steelhead may spawn there. The riparian buffers should be increased to at least the FEMAT buffers of 300’ no cut (without decreasing habitat protection elsewhere).

Services’ Response: See responses to comment 23 in Sierra Club letter (F, 23) and to comment 11 Mountaineer’s letter (G, 11).

11. **Comment on Original HCP and Modifications Approval:** I strongly urge you to take these problems into account when evaluating Plum Creek’s proposed amendments to the HCP. In order to protect wildlife and their habitat, these issues must be remedied before a final plan is approved.

Services’ Response: Thank you for your comments.

I. AMERICAN LANDS ALLIANCE

1. **Comment on Original HCP:** The proposal to amend the Plum Creek Company's Incidental Take Permit (ITP) and Habitat Conservation Plan (HCP) to facilitate the company's land exchange raises a number of concerns, many of which are not adequately addressed. Likewise, the proposal would perpetuate many of the problems with the existing HCP and its Implementation Agreement. We ask that the amendment be rejected until these problems are corrected.

Services' Response: As the Services have stated in response to similar comments, this land exchange does not raise issues associated with the original HCP. The Services determined that the original HCP met the issuance criteria established under Section 10 of the Act and, on that basis, a Permit was issued by the Fish and Wildlife Service on June 27, 1996. At this time we remain unaware of any problems with the HCP that need to be addressed and note that the conservation program associated with the HCP is being implemented in accordance with the IA. However, the original HCP is beyond the scope of this action. The Services will evaluate this proposed modification with respect to the criteria outlined in the Implementation Agreement. The majority of comments contained in this letter are outside the scope of and do not pertain specifically to this project. However, the Services have attempted to categorize these remarks and provide examples and responses to those examples.

I.I SUMMARY

2. **Comment on Issuance Criteria:** Plum Creek's Incidental Take Permit (ITP), Habitat Conservation Plan (HCP), and Implementation Agreement (IA), including as amended, fail to fully minimize and mitigate the impacts of "taking" listed species' habitats. Likewise, the amendment fails to minimize and mitigate these impacts to the "maximum extent practicable, as required by the Endangered Species Act (ESA) and other policies. Northern spotted owl nesting, roosting, and feeding habitat, for example, will continue to decline over the next 20 years. These declines will exacerbate spotted owl habitat and population losses on other private and public lands occurring at the same time, seriously impacting the owl's chances of survival and recovery.

The commentator also stated that stream buffers were still inadequate for listed species and stated that these provisions fall far short of those recommended by Washington Conservation Groups and NMFS's recommendations to the State of Oregon. The commentator stated that the HCP fails to utilize alternative silviculture, citing a paper produced by the commentator; fails to utilize the best available science; fails to adequately address unlisted species, citing another paper produced by the commentator; locks out adaptive management; and other comments addressed in more detail later in the comments. The commentator said that the ITP/HCP "amendment" should not be approved until the preceding problems are corrected, and the other standards and goals listed in the following section are met.

Services' Response: These topics of §7 consultation and issuance were previously addressed in the FEIS at pages A-130 to A-133. As to "jeopardy" for the listed species and their habitat in the HCP Planning Area, the Fish and Wildlife Service prepared a section 7 biological opinion for Plum Creek's Incidental Take Permit. The Biological Opinion concludes, "It is the biological opinion of the Service that implementation of the proposed HCP is not likely to jeopardize the continued existence of the northern spotted owl, marbled murrelet, grizzly bear, gray wolf, bald eagle, or peregrine falcon."

As to "impacts" to salmonids in the Planning Area, the National Marine Fisheries Service has prepared an Anadromous Salmonid Unlisted Species Analysis and Findings for the Plum Creek Timber Company's Habitat Conservation Plan and Unlisted Species Assessment. This analysis

considered the same elements that are normally considered under sections 7 and 10 of the ESA. The analysis concluded, "Considering the possible cumulative effects to anadromous salmonids, the conservation Measures identified in the HCP either minimize, or mitigate the effects to the maximum extent practicable. Habitat for sensitive life stages of anadromous salmonids will be increased by the measures identified in the HCP." Regarding the recommendations made by NMFS to State of Oregon, see response to Muckleshoot Indian Tribe comment #88 (C.II, 88). With regard to recommendations submitted by Washington conservation groups in a recent Statewide effort, see response to American Lands Alliance comment #3. This HCP incorporates alternative silviculture, does not preclude (but promotes) adaptive management, and utilizes the best available science. These concerns are addressed in more detail in response to the specific comments later in this section, such as comment #4 regarding alternative silviculture, and comment #5 regarding best science and stochastic events.

As to "impacts" to other unlisted wildlife species in the HCP Planning Area, the Fish and Wildlife Service has prepared an Unlisted Species Assessment, which analyzes the effects of the HCP on unlisted wildlife species in the HCP Planning Area. The Assessment concluded, "The HCP must be taken as a whole, and overall far exceeds State regulations. In conjunction with the NWFP on adjacent and interspersed lands, will result in a much better landscape than State regulations and will yield ecosystem benefits on the stand and the landscape level." And later, "For the reasons stated in this Assessment, implementation of the HCP should adequately address vertebrate species by providing for their continued existence at viable levels and with sufficient distribution, and would not contribute to the need to list or elevate the status of such species or invoke other special measures."

Whether the HCP minimized and mitigated the impacts of taking to the maximum extent practicable was analyzed in the Services' findings documents. The HCP and IA contain measures to minimize and mitigate the impact of take of owls, murrelets, grizzly bears, and gray wolves, as well as the other vertebrate species. The overall goal for species conservation in the HCP was to address the range of all habitat types which occur in the Planning Area. In terms of the range of habitat types which occur in the Planning Area, the present HCP provides more protection than would occur in the absence of the HCP. The described prescriptive activities and minimization and mitigation measures provided in the HCP are summarized in the Services' finding documents and in the unlisted species report. Our primary measure of this concept is that the mitigation is commensurate with the impact of the actions and that the overall plan provides for the long-term survival of the species.

The HCP itself was developed through the course of protracted negotiation, review, and consultation with the government, industry, Tribal, and academic experts, in addition to input through the public process. As a backdrop to the development of the HCP were considerations of baseline environmental conditions, the need for enhanced conservation in the Planning Area, and the ability of the Applicant to implement prescriptions and procedures feasibly and in the context of its business constraints. All of these are factors that define practicability for this Applicant. In light of the above factors, the Services found that the HCP minimizes and mitigates the effects of take to the maximum extent practicable.

- 3. Comment on Small Stream Buffers:** Likewise, the HCP amendment still fails to provide adequate stream buffers for listed and otherwise imperiled salmonids and other aquatic and riparian species. The HCP fails to provide stream buffers on intermittent streams, except where they have a steep and unstable inner gorge. These provisions fall far short of those recommended to the Washington Department of Natural Resources by Washington conservation groups, and also fall far short of the National Marine

Fisheries Service's recommendations to the State of Oregon for addressing coho salmon, i.e., NMFS (1998). We wish to incorporate these recommendations, which are well known in the region, by reference.

Services' Response: *Regarding the recommendations to the Washington Department of Natural Resources, this HCP far exceeds the majority recommendation of the State, Federal, Industry, and Non-Industrial caucuses. Many of the Tribes have also supported that recommendation, while other Tribes have submitted their own recommendations.*

Regarding the Environmental Caucus recommendation, the Service has reviewed both the proposal submitted jointly by the Washington Environmental Council and the Washington State Field Office of the National Audubon Society (December 1998)(WEC-AS proposal) and the associated scientific assessment (Pollock and Kennard 1998). The Services appreciate the efforts of all those involved in the preparation of these documents.

The issuance criteria for an incidental take permit are contained in the Endangered Species Act and again in its implementation regulations. The Fish and Wildlife Service's issuance criteria contained in 50 CFR 17.22(b)(2) and 17.32(b)(2) are: (1) The taking will be incidental; (2) The applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (3) The applicant will ensure that adequate funding for the conservation plan and procedures to deal with unforeseen circumstances will be provided; (4) The taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild; (5) Applicant will ensure that other measures FWS may require as necessary and appropriate will be provided; (6) The Services have received such other assurances as may be required that the HCP will be implemented.

The National Marine Fisheries Service's issuance criteria contained in 50 CFR 222.22(c)(2) are: (1) The taking will be incidental; (2) The applicant will, to the maximum extent practicable, monitor, minimize, and mitigate the impacts of such taking; (3) The taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; (4) The applicant has amended the conservation plan to include any measures (not originally proposed by the applicant) that the Assistant Administrator determines are necessary or appropriate; and (5) There are adequate assurances that the conservation plan will be funded and implemented, including any measures required by the Assistant Administrator.

Nothing in these regulations states that the species has to be better off with issuance of the permit than without issuance, or that the species must be benefited as much as possible. In fact, the ESA states that if the issuance criteria are met, the Services shall issue the permit.

The referenced strategy (WEC-AS proposal) is clearly a very good strategy for fish and aquatic habitats. The Services would be unlikely to reject an HCP containing such measures in most cases. However, applicants are equally unlikely to accept such a strategy when considering their economic situations. The Services believe that the benefits of implementing the WEC-AS proposal are distinct with respect to fish and aquatic habitat. However, the Services do not believe they can justify "imposing" these standards on applicants based upon our issuance criteria. We do not believe that most applicants would be required to follow such measures to provide for the recovery of salmonids, to minimize and mitigate the impacts of the taking which results from their actions, and to ensure that the measures they are providing are commensurate with the impacts of the taking which results from their actions. It is important to remember that HCPs are not strategies to avoid take, but rather acknowledge that some level of take will occur and provide authorization for such take in exchange for the specific HCP conservation measures.

The Services believe different stream types and different landscapes require different amounts of protective measures as each have different vulnerabilities and capabilities. One-size-fits-all regulations or standards do not work. They generally under-protect some sites and over-burden

landowners on other sites. The level of uncertainty and variability is great when considering a geographic area as large as the State of Washington or even the western half thereof. In order to fully protect all streams and landscapes with one set of guidelines, those guidelines must be extraordinarily robust, such as the WEC-AS proposal.

However, accounting for site-specific factors can allow managers to better “fit” protective measures to the vulnerabilities and capabilities of their lands. This is what happens during HCP negotiations and this is what occurs during watershed analysis, albeit to different degrees and on different scales. A strategy which works on one scale, does not necessarily work well on a larger or smaller scale. We believe utilizing dual processes that operate on two different scales, such as those utilized in both the Plum Creek Cascades and Washington DNR HCPs is ideal. Minimum buffer widths are established based on the general landscapes involved, and then a process of future landscape-specific or watershed-specific assessments (watershed analysis in Plum Creek’s case) provides a finer-grained refinement.

Statements made early in the WEC-AS proposal deal with the continuum of risk, urgency, and the need to not compromise salmonids continued existence in order to avoid big changes for the timber industry and nonindustrial tree farmers. While conditions in the forested portions of Washington State may be degraded and need to be improved, such discussions regarding the status of salmonids must be conducted in the context of the full suite of habitats upon which salmonids rely. The primary or sole fault of the salmon decline does not lie with the timber industry, although clearly past actions have contributed. Instead, the Services view with “urgency” the conditions in nonforested areas. We applaud the WEC-AS proposal for recognizing these factors as well.

The WEC-AS proposal is clearly a low-risk strategy, as it claims. In fact, the Services view it as an indisputably, truly low-risk strategy. We believe the strategies employed in Washington State by the 4 HCPs which have been issued covering aquatic species are also low risk, even if they are not quite as low risk as the WEC-AS proposal. However, each one of them is appropriate for their landscapes. With respect to the Plum Creek Cascades HCP, we believe this is especially true. It is a low-risk strategy for salmonids and provides measurable and distinct benefits over the alternative of no HCP. We believe it provides the vast majority of the benefits that would be obtained if the WEC-AS proposal were implemented instead, but provides substantially more economic flexibility and return to the Permittee. We agree that the WEC-AS proposal would have provided even a lower level of risk.

The science contained in the associated assessment (Pollock and Kennard 1998) appears sound. The understanding of the Washington DNR HCP might have benefited from discussions between the preparers of the report and the Services or plan developers/implementors at Washington DNR. Several “subtle-yet-influential” factors may have enhanced the precision of the subject assessment. We only raise this minor issue as the Washington DNR HCP and Plum Creek Cascades HCP share many similarities, especially with regard to riparian buffer strategies. In general, we agree with the associated assessment (Pollock and Kennard 1998) in terms of relative consequences of current State regulations, TFW Forestry Module Proposal, and HCPs like the Washington DNR HCP as displayed in Figure 3 of that document. We agree that current State regulations provide the least protection and result in the most cumulative loss of large woody debris sources compared to no-harvest scenarios. We agree that the Forestry Module is an improvement over State regulations and that the Forestry Module provides nearly the same functions as has been achieved on most HCP lands in Washington State. We also acknowledge that HCPs result in some potential loss of large woody debris sources, when compared to no-harvest scenarios. While the numbers regarding the DNR HCP may not be exact, the relative positions of these riparian protection strategies is clear. We commend the

preparers of that report for their diligent application of the best available science and their attempts to quantify the effects of strategies for the benefit of decision-makers.

The Services believe that we are relying on the same science as cited in the above report. The Services do not claim that we are achieving exactly the same benefits with HCPs as some of the more-conservative strategies being employed by the Federal agencies or recommended by Environmental Groups or Native American Tribes. Instead, under the direction of the Endangered Species Act and our Trust Responsibilities, we are negotiating improved and sufficient management practices for the benefit of fish and wildlife species. This is done in the context of private landowners needing to minimize and mitigate the impacts of their actions to the maximum extent practicable. The minimization and mitigation (conservation measures) the landowner will be undertaking need to be commensurate with the impacts of the taking that will be caused by their actions. Landowners do not need to mitigate for past actions which occurred on their lands or for adjacent lands which are not under their control. However, past actions and adjacent conditions must be considered in the context of such decisions. Finally, any such plan must not jeopardize the continued existence of any listed species, and over long permit periods must similarly not preclude recovery of such species. This is assessed in the context of whether recovery would be achieved if all similarly situated landowners conducted similar actions.

These requirements do not state that the habitat must improve. In some cases, an incidental take permit can be issued which would allow degradation of habitat beyond what would have occurred without the permit. Nothing in the ESA says the proposed action has to be better than the no action. However, we are not often afforded such luxury. More often, we are deliberating about badly degraded habitats or mere remnant amounts of habitat. Thus, in the majority of such cases, we are seeking improvement in habitat amounts or condition over and beyond the current condition — habitat conditions or amounts that can only improve over long periods of time.

With respect to the issue of salmonids, other fish, and their habitats; the Services believe we are capturing a very high percentage of the conservation available to the species. A point of diminishing return is often reached with respect to buffers. As buffers become larger and larger, the benefits achieved with each incremental increase become smaller. This relationship continues to the point where horrendous forfeiture of productive timber lands would be required to achieve diminutive results. Our goal in approving HCPs is to find a balance which does not compromise the essential requirements of the species, but similarly allows economically viable actions to continue. We believe we have done this in the 4 Washington State HCPs which address aquatics and that this is also the case in the Plum Creek Cascades HCP in specific. We do not believe that the modification of the HCP to accommodate the land exchange and the resulting land base will alter that situation.

Regarding NMFS' comments on the Oregon Plan, see response to Muckleshoot Indian Tribe Comment 88.

4. **Comment on Alternative Silviculture:** The HCP, including as amended, also fails to fully utilize alternate forest practices that are both practicable from Plum Creek's standpoint, and that would reduce impacts to a variety of listed and unlisted species. These practices are discussed in detail in our paper entitled "Improving Forest HCPs by Recognizing the Practicability of Alternative Forest Management Regimes" (American Lands (1999)), which we wish to incorporate into our comments by reference. Copies of this paper have been provided to regional US Fish & Wildlife Service staff.

Services' Response: Alternative forest practices are a major component of this HCP. Plum Creek maintains the ability in this HCP to utilize their environmental forestry practices. The HCP specifies habitat results, not methods. The Fish and Wildlife Service has reviewed the publication mentioned and is familiar with the silvicultural practices of many of the entities listed. We believe that the lengthened rotations and innovative silviculture practiced by Plum Creek is at least as environmentally friendly as many mentioned in the subject paper. We appreciate the fact that the commentor has acknowledged the quality silviculture being conducted by a number of other Service partners.

5. **Comment on Best Science and Stochastic Events:** The ITP/HCP, including as amended, fails to use the best available and credible scientific analyses and planning methods. For example, the ITP/HCP amendment fails to account for habitat losses due to fire, wind or other natural events. Such events are highly likely to reduce habitat on the property for species covered under the ITP and HCP, yet Plum Creek is not responsible for ensuring that its mitigation measures remain effective given these losses.

Services' Response: See response to comment 13 in Sierra Club letter (F, 13).

6. **Comment on Harvest Assumptions:** The ITP/HCP amendment also assumes that there will be no logging on National Forest lands in the Snoqualmie Pass Adaptive Management Area, late-successional reserves, and matrix areas. This assumption — and the assumption that any logging will benefit imperiled and sensitive fish, wildlife, and plant species — is grossly incorrect.

Services' Response: The Services believe that certain types of "ecological thinnings" would benefit wildlife. Wildlife scientists, including those working for the Services as well as those from other agencies and academic institutions, continue to recommend such actions as tools to enhance habitats. This is particularly true of treatments within the large amount of our landscapes currently in the stem-exclusion stage. Also, see response to comment 38 in Forest Service letter (B.II, 38).

7. **Comment on Species Analysis:** Similarly, the ITP/HCP amendment relies upon and perpetuates the flawed multi-species analyses used in the original ITP/HCP. These analyses fail to use credible scientific procedures, fail to use information on species' conservation needs and Plum Creek's land management impacts, and fails to provide mitigation measures and otherwise address unlisted species as if they were already listed, as is required by the final "no surprises" rule, Congressional intent for ESA Section 10, and the Services' HCP Handbook. Problems with the HCP's multi-species' analyses are discussed in Hall (1997), which we wish to incorporate by reference. This paper has been published in a predominant law review, and is known by regional US Fish & Wildlife Service staff.

Services' Response: See responses to comments 19 and 21 in Sierra Club letter (F, 19 and 21).

- 8. Comment on Preclusion of Adaptive Management:** The ITP/HCP amendment also locks-out basic adaptive management procedures by incorporating “no surprises” guarantees. As a result, the ITP/HCP will fail to use the best available science over time, will fail to minimize and mitigate impacts to species to the maximum extent practicable, and stands an excellent chance of seriously impacting species’ chances of survival and recovery. “No surprises” type guarantees ultimately preclude meaningful changes and improvements to an HCP, including when necessary to ensure the plan’s mitigation measures remain effective over time due to shortcomings in their original design, due to changes in the landowner’s land management, changes in environmental conditions, and other factors.

Services’ Response: “No Surprises” does not limit the ability of the Services to obtain additional mitigation under adaptive management. The HCP does not fail to minimize and mitigate impacts to species to the maximum extent practicable, as this legal standard was already addressed in the Services Set of Findings. The HCP does not “stand an excellent chance of seriously impacting species’ chances of survival and recovery” as any HCP would be terminated prior to appreciably reducing the chances of survival and recovery in the wild. The Commentor stated that “No Surprises” type guarantees ultimately preclude meaningful changes and improvements to an HCP. This is not the case, in fact, much of the benefit to a Permittee of no surprises may be relinquished in the process of agreeing to adaptive management. One of the reasons a permittee would agree to such measures is the high degree of confidence that the original prescriptions would be found to be adequate. Also, See response to comment 19 in Sierra Club letter (F, 19). Please note that the Implementation Agreement states with regard to adaptive management that “such changes may require more or less restrictions on operations than were provided for under the original HCP.”

- 9. Comment on Modification Denial:** In short, the ITP/HCP amendment should *not* be approved until: i) the preceding problems are corrected, and ii) the other standards and goals listed in the following section are met.

Services’ Response: The decision with respect to the HCP modification will be consistent with applicable law and the criteria outlined in the Implementation Agreement. Many of the policies and criteria listed in the subject comment do not apply to HCPs, do not apply to sustainable-use HCPs, and do not apply specifically to this modification action.

- 10. Comment on NMFS Authority:** It should also be noted that the National Marine Fisheries Service (NMFS) does not appear to have the authority to issue ITPs for threatened species, and therefore should not approve any ITP/HCP amendments for threatened anadromous fish. (See the NMFS rules for ITP rules, as provided in the Services’ HCP Handbook.).

Services’ Response: The National Marine Fisheries Service may issue permits for threatened or endangered species under their jurisdiction. In fact, with the proposed listing of steelhead in the Yakima River Basin and the proposed listing of Puget Sound Chinook, Plum Creek has requested that these species, under NMFS jurisdiction, be added to its incidental take permit. As of March, 1999, NMFS has issued their first permit. This permit was issued to Pacific Lumber for coho salmon, a threatened species as of December 2, 1996 (October 31, 1996 Federal Register (61 FR 56138)). That HCP also covered chinook, sea-run cutthroat, and steelhead. For an expanded explanation of the regulations and NMFS authority, please see response to American Lands Alliance comment #28.

11. Comment on Incorporating Previous Comments: We also wish to incorporate by reference the public comments provided by various parties on Plum Creek's ITP and HCP as they were originally designed .

Services' Response: Comment acknowledged. The Services herein incorporate our responses to those comments.

I.II DETAILED COMMENTS

12. Comment on Original HCP: As with Plum Creek's original HCP, ITP, and IA, the proposed ITP/HCP amendment fails to meet most of the following scientific and legal standards for HCPs. These standards are listed below. The proposed amendment should be rejected until these standards are met.

Services' Response: We believe that this modification is consistent with the applicable law and the Implementation Agreement, and Plum Creek's HCP continues to be properly implemented. The original HCP met and continues to meet all of the issuance criteria, but is not the subject of the proposed action.

13. Comment on Standards: The following standards are common sense approaches needed to meet the requirements of the ESA, including the requirements to use the best available science, avoid significant impacts to species' chances of survival and recovery, and minimize and mitigate impacts to the maximum extent practicable. The standards are also based on the recommendations of a number of independent conservation biologists, scientific assessments of HCPs, and other independent sources.

Services' Response: The Service notes that this HCP has met all of the standards required by the ESA. The original HCP not only utilized the best scientific information, it involved the collection and development of science we it did not yet exist, and it utilized scientific processes such as peer review. As in all HCPs upon which issuance of a permit is based, the issuance criteria must be met. These criteria include that the impact of taking must be minimized and mitigated to the maximum extent practicable and that jeopardy must be avoided. With many long-term permits, the Services believe that recovery and survival are not much different; therefore, that recovery cannot be precluded either. The Service believes this HCP not only provides for recovery by not precluding it, but enhances the recovery of many species.

The Services note that to date there have been no scientific studies of HCPs as a program. There have been a number of surveys of stakeholders for projects focusing on public participation, as well as surveys of students' opinions about the science in HCPs. Many of the reviews conducted to date have not been unbiased and few have been comprehensive.

14. Comment on Policies: Likewise, many of these goals and standards are explicitly required by existing policies. In reviewing the proposed amendment to Plum Creek's ITP, HCP, and implementation agreement, the Services should consider each of the policies listed in Section III.

Services' Response: *The Services, having reviewed Section III, note that the requirements of existing laws, regulations, and Service policy (both existing and formulative) have been met by this particular project. However, we also note that many of the policies listed in Section III do not apply to this HCP, do not apply to HCPs as a whole, or are taken out of context. For instance, the Commentor states that "Sierra Club et al. v. Bruce Babbitt et al recently held that replacement habitat must be provided for habitat destroyed by development projects..." This HCP does not cover any development projects. The concept is not applicable to HCPs covering sustainable uses of native habitats such as forestry or grazing.*

- 15. Comment on Listed Resources:** Along with other sources of information on the affected species' conservation needs and potential mitigation measures, the Services should also consider the resources listed in Section V below. Most of these resources are publicly available and/or have been sent to the regional Fish & Wildlife Service at previous times.

Services' Response: *The resources listed in section V of the comment are not specific to this project.*

- 16. Comment on Alternative Silviculture:** Finally, a number of existing forest HCPs demonstrate the feasibility of utilizing more effective mitigation measures and other key plan components. Some of these precedents are listed in Section IV.

Services' Response: *When the commentor states that the examples represent "more-effective mitigation" it is the Services' interpretation that he means to compare those mitigation packages to the Plum Creek HCP with regards to effectiveness. The Services evaluated each of the examples presented. Some do not relate to the effectiveness of the mitigation. In one example, the fact that a scientific review panel was established in which the public was consulted regarding the designation of panel members does not address whether the mitigation was "more effective" than the use of 52 scientists in peer review for the Plum Creek HCP in which the Services approved the lists of peer reviewers. Thirteen technical papers were reviewed as part of the Plum Creek HCP effort.*

In another example, the commentor notes that the Services proposed to withhold "No Surprises" assurances from an applicant for specific species. Rather than using that particular HCP as an example of "more-effective mitigation," it would better serve as an example of "less-effective" mitigation, which is why the Services were proposing to withhold "No Surprises" at that time. Also, we should note that with codification of the "No Surprises" policy in March of 1998, there no longer exists the option to withhold the "No Surprises" assurances from any HCP. Adaptive management, however, is a tool which can be used where areas of uncertainty exist. Under adaptive management, the permittee may be expected to provide additional mitigation when needed. The Services note that it was the Plum Creek HCP that pioneered this concept with respect to HCPs where required changes to management strategies would be conducted at additional expense to the Permittee.

A number of examples are cited of "no net loss" HCPs. The Service notes that the Plum Creek HCP is generally a net gain HCP, not just a "no net loss" HCP. In another example, the commentor states that a permittee agreed to protect all northern spotted owl sites over time. The example fails to mention this is only the nest core (100 acres) and seasonal disturbance protection. Other examples used for reserve establishment are either not inviolate reserves, are a very small percentage of the ownership, or both. Some of the prescriptions cited in the examples are not accurate or apply to different situations. It is not an accurate statement to say that "virtually all forest HCPs used surveys

for northern spotted owls". In fact, most forest HCPs are initiated to avoid the expense and uncertainty associated with the survey-site system.

When assessing whether the minimization and mitigation is to the maximum extent practicable, one must first assess it in the context of the impacts. Second, one must look at what the land-manager is capable of providing. The Services assess whether the proposed measures are commensurate with the impacts and provide for the long-term survival of the covered species. The context of each HCP, including such factors as its location on the landscape, is very important in this determination.

- 17. Comment on HCP Standards:** The commentor lists a number of recommendations from a recent survey of students with respect to HCPs.

Services' Response: *The Services note these comments are not specific to the HCP Modification. A number of the listed recommendations are already a part of the HCP program, such as "the percentage of local and global populations that will be "taken" should be assessed". Additionally, the Service is familiar with the survey in question and has studied each of the specific responses regarding the original Plum Creek HCP. Our conclusions were that this survey was flawed in its basic design, was not thorough in its review of documents, failed to review most of the documentation for the project, and was not rigorous in its response to survey questions. The Service further notes that any unbiased critique of scientific documents must in itself follow the rigorous guidelines it would set for the processes being reviewed. The identified survey did not do this. The Service has responded to the cited survey and incorporates those comments into this response. The Service's response can be obtained from our website at: www.fws.gov/r9endspp/hcp/response.htm.*

- 18. Comment on Scope and Applicability:** The Commentor states that ITPs and HCPs should only be used in limited circumstances and provided numerous examples of limitations to the use of HCPs. The commentor states that the ITPs and HCPs should not be used where more effective alternatives exist. Further, he recommends that the number and scale of HCPs being developed and approved by the Federal agencies be limited to reflect the agencies implementation capabilities. He closes with a recommendation that the ITP/HCP in question be evaluated in this light.

Services' Response: *The ESA does not give the Services discretion to issue ITPs only in "limited circumstances." Where a permit application meets the statutory criteria, the Services are required to issue the permit. See 16 USC §1539(a)(1)(B). The Services note that many of the recommendations listed are not issuance criteria. The Services note that after carefully considering their situation, the Permittee concluded that an HCP was the appropriate tool in this particular instance. The Services are not aware of any information which would suggest otherwise. Comments regarding the scope of the HCP program nationwide, as well as the original HCP are beyond the scope of this project. However, the Services note that they are involved in the implementation and monitoring of this particular HCP and will continue to be involved in the future.*

- 19. Comment on Other ESA Policies and Programs:** "Safe Harbors" type agreements should not be given to landowners who have significantly reduced their baseline habitat conditions below natural levels, or who will be degrading habitats under ITPs and HCPs. Phase II of Plum Creek's HCP is essentially a "safe harbors" deal. HCPs should not be used as substitutes for listings or critical habitat designation.

Services' Response: *Phase II of the Plum Creek HCP bears much resemblance to a "safe-harbor" situation. Following termination of the plan, Plum Creek will be required to maintain habitats above the baseline conditions in order to receive the benefits associated with "phase II". However, the*

baseline is defined as the conditions predicted to occur at year 50. In the event of early termination, the baseline will be defined as the current baseline at time of permit issuance or year 50, which ever is greater. "Which ever is greater" is a significant phrase in this regard. This is tremendous incentive for Plum Creek to not terminate early with respect to certain habitat types. In particular, riparian habitats, which improve significantly over the 50-year period, would benefit from this provision. The Service also notes that this HCP was not used as a substitute for listing or critical habitat designation.

20. Comment on Conservation, Recovery, and Mitigation Standards: The commentor lists a large number of recommendations regarding mitigation standards such as "the HCP should utilize alternate land management and development practices and opportunities, which provide the landowner with reasonable economic returns but have fewer impacts to imperiled and sensitive fish, wildlife, plants, and ecosystems. Examples include longer timber rotations, harvest of mushrooms and other non-timber forest products, fee-based recreation, and provision of ecosystem services such as delivery of clean water, adequate summer flows of water, and the sequestration and storage of atmospheric carbon dioxide, all of which are more associated with older, more diverse forests subject to fewer disturbances.

The commentor further states "as a first preference, impacts and "take" should be avoided (i.e., minimized). Then, all remaining "take" and impacts must be fully offset..."

The commentor states that mitigation habitat must "actually support populations of the species in question". Yet, he further states protection of habitat areas should not be contingent upon continuous use by the species in question. Many species do not occupy the same site continuously. Consequently, a lack of protection for unused areas will lead to a cumulative loss of habitat.

The commentor also states that "as envisioned by Congress, the HCP must actively benefit each species above and beyond accurate baseline conditions and trends. These benefits must be in terms of species-specific measurable increases in habitat quantity and quality, and in species' populations."

Services' Response: *The Service notes that this HCP includes lengthened rotations, application of alternative silviculture, measures to ensure clean water and adequate flows, and a number of other benefits associated with older forests in general and older forests associated with streams, wetlands, and other special sites. Plum Creek has an open lands policy and does not charge for recreation. The Services note that since flying squirrels forage on mushrooms, harvesting of mushrooms may have impacts upon spotted owls particularly if it were to occur in prime nesting areas.*

The Services disagree that avoidance of take is always the best option. Applying the principles of conservation contained within the many references cited by the commentor leads one to the logical conclusion that some individuals or habitat remnants are isolated from population centers or, due to the proximity of other factors, are functional "sinks". In cases such as this, loss of an isolated vernal pool may be allowable in association with more effective mitigation elsewhere. In other cases, take is not severe, but costly to minimize. More effective means of addressing the species needs can be found by focusing attention on the most significant threats to the species or habitats in question. In the case of the Plum Creek HCP, we note that there is very little take of listed species due to the substantial avoidance and minimization components to the operating conservation program.

With respect to comments such as "all remaining take and impacts must be fully offset" the Services note that this is not a criterion for HCPs. The issuance criteria in question is that the impacts of the taking must be minimized and mitigated to the maximum extent practicable.

With respect to occupancy, the Services note the irony in the arguments made by the commentor. If the mitigation value is based upon occupancy, then protection or assessment of impact may be based upon occupancy. If the habitats to be effected are assumed to be occupied, then so long as similar habitats are protected, the same assumption can be made for protected habitats. This is more a function of fairness and common-sense than of biology. The biological issue is to select the appropriate ground rules for the appropriate species/habitats.

Regarding comments on “actively benefiting species,” the Services note that the issuance criteria do not contain such a criterion, but many HCPs do result in benefits to the species beyond what would have occurred in the absence of a permit. Regarding the commentor’s assertion that HCPs must promote the recovery of each species, the Services note that recovery is essentially indistinguishable from long-term survival in most cases, and the Services must ensure long-term survival especially in light of long-term permits. However, long-term survival will be accomplished across multiple ownerships in most cases and a single landowner will seldom be required to recover a species on their lands alone.

- 21. Comment on Unlisted Species:** If candidate, proposed-listed, rare, endemic, or other unlisted species are covered by the HCP, ITP, IA, and/or “No Surprises” type assurances, then the species’ conservation and recovery needs, impact assessments, and impact minimization and mitigation measures must be addressed and developed as thoroughly as if the species were listed. Moreover, the mitigation measures provided for unlisted species must be sufficient to help reverse any population declines and to preclude the need for the species to be listed.

All other HCP policies, goals, and standards for listed species are also applicable to unlisted species covered by the plan and its agreements.

Services’ Response: *The Services concur that unlisted species should be treated as if the species were listed. However, this does not necessarily mean that the mitigation on a small piece of property can alone preclude the need to list a wide-ranging species. The Services should assess whether the same measures, if applied to all similarly situated lands, would have the desired effect for the species. All other standards for listed species are applicable to unlisted species covered by an HCP/ITP.*

- 22. Comment on Other Species and Ecosystem Goals:** The HCP should conserve and help restore habitats for species which are: endangered, threatened, candidate species, former candidates, proposed listed, in decline, area limited, dispersal limited, resource limited, process limited, keystone species, endemic, umbrella species, or otherwise of special concern. Special attention should be provided to species with large area requirements, specialized habitat needs, functional importance in their ecological community, or particular sensitivity to human disturbances. The HCP should conserve and help restore entire ecosystems.

Services’ Response: *The Services concur that HCPs can be used as a tool to address entire ecosystems. We do note, however, that there are inherent conflicts between the needs of many species; for example, Nashville warblers and brown creepers utilize different habitats. When a program embarks upon an ecosystem approach (coarse-filter) it must recognize that limits are imposed regarding the use of species-by-species actions (fine filter). The Services believe this particular HCP is contributing to ecosystem management. It began with a coarse filter approach to address all habitat types and forest stages, but focused on those habitat features that the Services believed were in greatest need on most western Washington landscapes, primarily mature forest with structure, healthy*

riparian systems, and special habitat types. The HCP utilized a guiding approach to assess benefits and impacts to species, but also focused on a number of species in specific as suggested by the commentor. These species included grizzly bears, goshawks, larch mountain salamander, and vaux swift, among many others. Additionally, the Services analyzed a large number of species of concern individually within its unlisted species assessment for some of the various reasons mentioned by the commentor, including keystone species, sensitive species, and species of interest to the Tribes.

- 23. Comment on Planning and Analysis:** The commentor states that the HCP and NEPA analyses must use the best available science, as required by section 7 of the ESA, during all analyses, planning, adaptive management, and implementation. The commentor lists a number of factors he believes constitute these standards such as “the plans must identify the specific forest management regimes likely to be used in different areas by the landowner over time.”

The commentor also made recommendations such as the HCP or NEPA document must document how land management activities permitted by the ITP will affect critical habitat for any threatened or endangered species, regardless of whether the species are officially covered by the ITP/HCP.

The commentor also discussed guilding and stated that if the HCP uses “guilds” or other approaches to addressing species which supposedly utilize similar habitat types, then the plan: i) should only group together those species which use very similar habitats, ii) must identify the specific habitat components used by each group, and iii) should discuss how these habitat components will be affected by forest management. Likewise, if habitat models, indicator species, or guilds are used, then they must use the best available science and detailed habitat descriptions, be clearly related to specific silvicultural or other land management practices, and limit indicators, guilds, and other groupings to species with closely related habitat needs. Nevertheless, use of guilds, models, etc., should not substitute for more detailed and species-specific information.

The commentor made a number of statements regarding species-specific requirements for information on habitats, presence, and standards. For example, the commentor indicated that species-specific information should be identified and considered and that accurate baseline conditions and trends, including existing regulatory mechanisms and management plans, be identified. Another example of the commentor’s statements were that surveys should be conducted for all species. Where surveys cannot be conducted, it should not be assumed that past land management eliminated all sensitive species and their habitats.

The commentor also stated that the definition of what land-management practices constitute “take” of species habitats must be biologically credible. The HCP and NEPA document must assess how activities allowed under the ITP will affect each species and their habitat components, and how these effects compare to conditions needed for both the species’ survival and long-term recovery. If the HCP or NEPA document claim that State Forest Practices Rules or other non-ESA policies adequately protect species, then the documents must discuss how, when, and where specific species are protected by these policies. HCP and NEPA analyses must account for how exceptions to the plan’s impact minimization and mitigation measures will affect the HCP’s performance and species’ chances of survival and recovery.

A number of comments listed maps and standards that must be presented for each species. The HCP and NEPA analyses should address fundamental ecological functions and processes such as soils, seasonal fluctuations in hydrology, nutrients, and other factors.

Services' Response: *The HCP incorporated a number of technical papers by reference. One of those identified the species-specific habitat needs of species of concern, and another identified these needs for the other wildlife species likely to occur in the Planning Area. The HCP addressed baseline condition and discussed ongoing conservation efforts as well as the history of those efforts.*

For species where survey information was not available or obtainable, it was assumed that the species was present, and it was in that context that effects were evaluated. The objective of the HCP is to maintain or create conditions conducive to maintaining those species on the landscape.

The HCP addressed the land-management activities which were likely to result in take. Habitat loss through the timber harvest is the factor of primary concern to the Services in HCPs such as this one. Therefore, the HCP focused on that factor to a greater degree than other factors. However, habitat loss through road construction and maintenance and other activities was also addressed. See the June 1996 Biological Opinion and the July 1998 Biological Opinion for a more detailed discussion of practices that constitute take. The HCP and NEPA documents assess the activities, and effects of the activities are described in those documents.

State Forest Practices Rules and Regulations alone were not viewed as adequate in many cases to protect each species. There are instances where State regulations will add to the protection guaranteed by the HCP. An example is the stream buffer system whereby minimum buffer widths were established by the HCP that exceed State regulations. State regulatory minimums were not viewed as adequate by themselves. Yet, a separate State regulatory mechanism, watershed analysis, is being used on an accelerated basis to add additional protection on a site-specific basis as necessary. Exceptions to minimization and mitigation measures were viewed in the context that they would occur, and that they would occur as a worst-case scenario in the absence of information to suggest otherwise. It was within this worst-case approach that such exceptions were viewed.

The Services note that habitat maps suffice when species can be linked to particular habitats and that the HCP addressed the distribution of habitats and also addressed the natural processes discussed by the commentor.

The Services believe HCPs and NEPA documents should use the best available science. The Service believes that the results of forest-management practices are the most important factor and that methods are of secondary importance. With regard to some issues listed by the commentor, the Service already is aware of the standards. For instance, effects to critical habitat must be addressed and this is a requirement of Section 7 of the Act. It is not a requirement that an HCP prepared by the applicant contain such information. With respect to this project, the Service notes that effects to critical habitat for the spotted owl and marbled murrelet were addressed in the 1996 Biological Opinion. With respect to guilding, the Service notes that the Plum Creek HCP provides a good example of the proper application of guilding. Supported by the wildlife matrix, species which use similar habitats for feeding and breeding were grouped into lifeforms; the specific habitat components utilized by each lifeform were identified; and the fate of these habitats and habitat components were modeled through time to determine effects and benefits to the lifeforms. Guilding cannot substitute for a species-by-species assessment, but can be the basis for it and provide an efficient tool. The Service will conduct a species-by-species assessment under section 7 of the ESA as additional species are proposed for inclusion on the permit.

24. Comment on Monitoring: The commentator remarks that HCPs must require that both compliance and effectiveness monitoring occur frequently over time, including monitoring of species' populations and reproduction, habitat quantity, habitat quality and specific habitat components, habitat trends, and other goals and indicators. Compliance monitoring assesses whether the landowner is implementing the mitigation measures and following the terms of the ITP, HCP, and IA. Effectiveness monitoring helps assess whether the mitigation measures are, when implemented, actually working to offset the landowner's impacts and support target species.

Services' Response: The Services note that we are conducting compliance monitoring. The Permittee is conducting implementation monitoring and effectiveness monitoring, and reporting at regular intervals to the Services (See Chapter 5 of the HCP). The Services do note that the areas to which effectiveness monitoring is directed are those areas for which critical questions exist and for which there is some level of uncertainty. In the case of the Plum creek HCP, there is a large amount of monitoring and research in spite of the robust nature of the operating conservation program. In addition, the monitoring program is a support mechanism for the adaptive management components of the plan.

25. Comment on Adaptive Management and Landowner Assurances: The commentator makes a number of statements regarding adaptive management. For instance, the commentator states that the HCP and IA must ensure that credible adaptive management will occur throughout the plan's implementation, to provide a mechanism for plan review, contingency planning, and corrective action. The commentator also states that reviews should occur at least every five years, and must consider potential corrections and additions to the plans' mitigation measures in light of monitoring data, new scientific information from outside sources, and changing conditions, both foreseeable and unforeseeable. Adaptive management must cover all species and plan components — not just areas where there are data gaps — particularly for plans covering longer time periods.

The commentator states that adaptive management should not be used in lieu of well-defined, up-front mitigation measures and expressed concern that changes which could be made through adaptive management may be precluded through "No Surprises" type assurances. The landowner must retain responsibility for funding and providing additional mitigation in response to all foreseeable changing circumstances or other circumstances within the landowners' realm of responsibility. If critical habitat designations or recovery plans do not exist for the species, then the plan must be amended once they are developed.

The commentator also lists a number of points regarding landowner assurances. For instance, the commentator states that the landowner should be responsible for providing additional mitigation if the Plan's initial mitigation measures were inadequate. The commentator also states that landowner assurances should not take the form of "No Surprises" type guarantees or other guarantees that largely preclude additional mitigation by setting extremely high burdens of proof for the Services, requiring additional mitigation to first occur on public lands, by requiring any additional mitigation to be fully subsidized by the public, and/or requiring any additional mitigation to be voluntary. "No Surprises" supposedly encourages landowners to pro-actively conserve species which are not listed as threatened or endangered by indemnifying the landowners from providing additional mitigation should the species be listed at a later date. However, the up-front analyses, protections, and mitigation measures for unlisted species are rarely sufficient. Even in cases where the up-front provisions are more adequate, changes and additions to these measures may well become necessary over time, including as a result of changes in the landowners' management practices.

The burden of proof should be on the landowner, rather than the public, to show that the plan adequately addressed the needs of newly-listed species, when requests are made to add the species to the ITP. Species should not be automatically added to incidental take permits.

The Commentor also expressed the opinion that the Services' failure to respond within narrow periods of time should not be grounds for the landowner to unilaterally proceed with requested changes to the ITP/HCP; that additional lands should not be added to the HCP and ITP over time without commensurate analysis and site-specific mitigation; and that the Services must retain authority to incorporate new information into the HCP, ITP and IA, and to modify the plan and its implementation to provide additional conservation measures, which may prove necessary for the conservation and recovery of the species covered by the plan.

Services' Response: *In general, the Services do not view adaptive management as a rigid requirement as expressed by the commentor. The Services view was expressed in the No Surprises rule published in the February 23, 1998, Federal Register. For instance, adaptive management, as specified in the No Surprises Rule, is a tool to be used where there are significant biological data gaps or significant uncertainty associated with the operating conservation program. It is not a requirement of each HCP or each facet of an HCP. Adaptive management can be used to address contingency planning, but changed and unforeseen circumstances can also be addressed in other ways.*

The Services agree with the commentor on the relationships between adaptive management and monitoring data, as well as new scientific information. However, changing circumstances as a result of external factors can be specifically excluded from adaptive management triggers. As mentioned above, adaptive management does not need to address all species or all plan components, and does not need to address every conceivable change that could occur in circumstances. It is a tool to be used where there is significant uncertainty.

A number of the commentor's points are valid and many have been incorporated into the subject HCP. For example, the Services do agree with the commentor that adaptive management should not be used in lieu of appropriate mitigation measures. While uncertainty may exist, the initial prescriptions must have a reasonable chance of success. The Services note that the No Surprise rule does not negate adaptive-management provisions. Where adaptive management is a component of an HCP, it becomes part of the operating conservation program to which the assurances apply. Therefore, adaptive management is complimentary to the "No Surprises" assurances rather than in conflict with it. In the subject HCP, the Services have a high degree of confidence in the initial prescriptions, such as the riparian protection measures. Yet, adaptive management, through actions such as watershed analysis, can only add to the riparian protection and not reduce it.

A number of comments were directed at assurances in the face of new circumstances. In general, the Services do not believe that the applicant should accept all of the burden in these situations. For example, the Services disagree that HCPs must address all hypothetical future events, no matter how remote the probability that they may occur. Rather, the Services believe that only reasonably foreseeable changes in circumstances need to be addressed in an HCP. Moreover, these circumstances are likely to vary from HCP to HCP given the ever changing mix of species and affected habitats covered by a given plan. The No surprises rule stated that if "additional conservation and mitigation measures are deemed necessary to respond to changed circumstances that were not provided for in the plan's operating conservation program, the Services will not require conservation

and mitigation measures in addition to those provided for in the plan without the consent of the permittee, provided the plan is being properly implemented. The Services are unsure about what the commentor meant by “high burden of proof”; but, in the subject HCP, extraordinary circumstances are defined as “a material and adverse change in the status of a population” with no requirement to link such change in status to the HCP as a causal mechanism.

Regarding the concerns on the respective balance of responsibilities among the participants to an HCP containing No Surprises assurance, the Services believe the No Surprises rule places the preponderance of the responsibility for protection beyond the terms of the specific HCP upon the Services. The Services have significant resources and authorities that can be utilized to provide additional protection for threatened and endangered species that are subject to a given HCP including land acquisition or exchange, translocation, and other management techniques.

Another difference is noted in the commentor’s view of unlisted species. One purpose of including unlisted species in HCPs and of making them subject to the No Surprises assurances, are to enlist landowners in efforts to conserve these species. Another purpose is to provide certainty to landowners who are willing to make long-term commitments to the conservation of listed and unlisted species that they will not be subjected to additional conservation and mitigation measures if one of the species is listed, except as provided in their HCPs.

The Services note with interest the commentor’s remarks that up-front analyses are rarely sufficient for unlisted species. It seems that this comment is also not specific to this particular project as the Plum Creek Cascades HCP and associated documents contained substantial analyses for unlisted species and also provide that a Biological Opinion and Set of Findings will be completed as additional species which may inhabit the Planning Area are listed under the ESA. The commentor states that the burden of proof should be on the landowner and that species should not be added automatically. While species are not added automatically in this case, the burden of proof will be upon the Services to show that its initial findings were not accurate and that addition of the species would result in jeopardy. However, the Services could still require redistribution of mitigation to accommodate the species needs, or use any of the other 7 levels of contingency actions outlined in the Fish and Wildlife Service’s June 1996 Biological Opinion.

The Implementation Agreement addresses response times for a number of different scenarios. It is appropriate for the Services to be allowed a specified length of time in which to approve or deny requests for modification. The subject HCP is covered by No Surprises assurances which limit the ability of the Services to require changes unilaterally; however, the HCP includes a number of mechanisms to include new information or provide more effective mitigation where necessary. With respect to the land exchange and the acquisition of lands by Plum Creek, the modification document attached to this Final Supplemental Environmental Impact Statement contains analyses and necessary adjustments to minimization, mitigation, and monitoring.

26. **Comment on Enforcement and Long-Term Implementation:** The commentator listed a number of points on this topic. The commentator states that the HCP must be covered by explicit, thorough, legally-binding, and publicly-available Implementation Agreement (IA) that satisfies each of the points listed in his comments. The Commentor listed points such as the full scope of the plan's mitigation measures, monitoring, adaptive management, and plan revision and improvement requirements must be enforceable. Enforcement language should not be replaced by dispute resolution processes, though dispute resolution can sometimes supplement enforcement provisions. The IA should explicitly state that the Services will re-evaluate the HCP when considering whether to add newly listed species to the ITP.

The commentator also expressed the opinion that the IA must explicitly maintains citizens' rights under the ESA to bring suit for violations of the plan, ITP, and IA, which should be understood as violations of the ESA. The commentator states that the Services must periodically review the plan's implementation to ensure the landowner is complying with the HCP, its adaptive management requirements, and other provisions. Reviews should be published in the Federal Register and include a plan summary, a status review of the species involved, a compliance report, any new information on the species' status, and any modifications needed to plan.

Services' Response: In general, the Services agree with many of the helpful comments provided. For some comments though, the Services note there can be more than one way to ensure performance or solve issues. The Services note that the draft Implementation Agreement was made available for comment in association with the draft HCP and that the FEIS included the revised Implementation Agreement (IA). The Services agree that the majority of the requirements listed by the commentator must be enforceable. Appropriately, the IA retained the Services ability to use enforcement even though it contained a dispute-resolution process, explicitly stated that the Services would re-evaluate whether newly listed species could be added to the ITP, and did nothing to reduce citizens' rights to bring suit.

Regarding reporting, for example, while the Services do not anticipate publishing reviews or availability of reports in the Federal Register or conducting status reviews of each species, we do expect to share implementation reports with interested members of the public. With regard to reviews on the subject HCP, we anticipate continuation of the "ongoing" reviews with state agencies, Tribes, and members of the public, through annual planning reviews, meetings, trips to the field, and other forums.

27. **Comment on Funding:** The commentator made a number of points relative to funding. For instance, public funding to support additional mitigation measures in response to truly unforeseeable circumstances may be appropriate. However, up-front funding sources must be assured before approval of an HCP that uses this approach. Up-front funding must be assured for all plan components and implementation, including monitoring and adaptive management.

Unforeseeable circumstances must not be defined to include natural disturbances, changes in markets or the landowner's land management practices, additional species' listings, declines in species' conditions due to the landowner's land management or inadequate initial mitigation measures, or the development of additional information on species whose needs were not well researched.

Services' Response: As stated earlier, the No Surprises rule places the preponderance of the responsibility for protection beyond the terms of the specific HCP upon the Services. The Services have significant resources and authorities that can be utilized to provide additional protection for threatened and endangered species that are subject to a given HCP including land acquisition or exchange, translocation, and other management techniques. Therefore, up-front funding sources to

address unforeseen circumstances are not a requirement for permit issuance. Up-front funding sources or assurances of implementation are necessary for components such as monitoring. Logistically, many components of plans, such as adaptive management, may not require an assurance of funding. For instance, leaving a larger stream buffer in response to adaptive management will involve the permittee leaving trees which could have become economic income. For this example, providing additional buffer width does not require up-front assurance of funding. Similarly, many seemingly logical requirements of development HCPs contained in the commentor's recommendations do not apply to HCPs regarding sustainable use of renewable resources.

Regarding unforeseen circumstances, the commentor lists a number of points. The Services do not necessarily disagree with each of these but note that unforeseen circumstances are whatever is not specifically excluded and whatever is not viewed as "foreseen" by plan developers. Even for those circumstances which are "foreseen", an applicant will only be responsible for the additional measures which were identified by plan developers and contained in the operating conservation program within the HCP. We do note, however, that many natural disturbances may truly be unforeseen circumstances. The commentor is encouraged to review the February 23, 1998, Federal Register for more details on this subject.

28. Comment on Key HCP Policies: The commentor listed a large number of points or statements referred to as "key policies". Many of the points listed cited previous documents, such as the summary of the Federal Register notice for the USFWS' HCP regulations states that incidental take permits and HCPs are intended for "...limited circumstances...". The discussion for the draft "No Surprises" rule stated that species should not be included in the HCP/ITP if data gaps or insufficient information makes it impossible to craft conservation and mitigation measures for those species.

NMFS' regulations do not appear to authorize incidental take permits for threatened anadromous fish and other species under NMFS' jurisdiction. The Federal Register notice for the NMFS regulations state that "...making these regulations apply to all threatened marine species is not appropriate..... Instead, the agency suggested that ESA section 4(d) rules could be written to authorize the use of incidental take permits for threatened species on a species by species basis. [55 Fed Reg 97, May 18, 1990, as provided in USFWS et. al. (1996).]

The commentor made a number of comments regarding section 7 and section 10 standards. For example, the commentor states that listed plants must be addressed and protected by incidental take permits/HCPs under ESA Section 7(a)(2). The Services may not approve an action which jeopardizes the survival and recovery of listed plants. ESA section 10(a)(2)(B)(iv) precludes the Services from approving an HCP, which appreciably reduces a listed species' chances of survival and recovery in the wild. ESA section 7(a)(2) also prohibits federal agencies from approving actions which would destroy or "adversely modify" species' critical habitat areas. The HCP Handbook states that mitigation should not only be based on sound biological rationale, but also be "commensurate with the impacts." The Services must analyze and document whether the HCP has indeed minimized and mitigated "take" to the maximum extent practicable.

The Services' HCP Handbook states that if the landowner cites economic considerations as the reason for failing to utilize an alternate land management approach, then the landowner must provide supporting economic information, unless it is proprietary. The Service's Handbook states that the landowner should provide up-front legal or financial assurances, such as a letter of credit, if mitigation measures will be implemented after "take" occurs.

Monitoring is also required under the Service's regulations at 50 CFR 17.22(b)(1)(iii)(B) and 50 CFR 222(b)(5)(iii). According to the HCP Handbook, all HCPs must monitor their impacts over time. The HCP Handbook also states that an HCP's monitoring provisions should be as specific as possible and be commensurate with the project's scope and the severity of its effects. The Handbook also states that monitoring must be sufficient to detect trends in species' populations. The HCP Handbook states that monitoring protocol must specify the frequency, timing, and duration of data collection; must specify how the data will be analyzed; and must specify who will do the analysis.

The Handbook states that mitigation habitat should be permanently protected. *Sierra Club et al v. Bruce Babbitt et al* recently held that replacement habitat must be provided for habitat destroyed by development projects. The commentor also indicates that mitigation should be close to the impact area, similar in habitat type, and support the same species as where the impacts are occurring.

Services' Response: *The "policies" listed by the commentor generally were of 3 types: (1) Those which are accurate statements of the Services policies and requirements for which the subject HCP complies; (2) Those that are not accurate statements of Service policies; and (3) Those points which are not relevant to the specific action of modifying the subject HCP. The Services provide responses to a number of examples below. The Commentor indicates that HCPs should be used in limited circumstances. The ESA and its implementing regulations state that if an applicant submits an application which contains the mandatory elements and meets the issuance criteria, the Services shall issue the permit. The Services believe that HCPs are limited to situations where a landowner has activities they need to conduct which may result in take of a listed species, volunteers to go through the HCP application process, and meets the standards thereof. Where information gaps make it impossible to craft conservation measures, species should not be included in the HCP/ITP. This is the very reason that invertebrate species were not addressed in the subject HCP. However, it should be noted that data gaps must be viewed in relative terms. HCPs differ in amounts of up-front research and data collection, use of adaptive management, and conservation derived from initial prescriptions. There are clearly situations where some invertebrate species can be covered by HCPs; in this case, the applicant chose not to address such species.*

Regarding NMFS regulations, differences between NMFS regulations and FWS regulations are often confusing to many people. While the FWS extended section 9 prohibitions to threatened species through a "blanket" 4(d) special rule, NMFS has not taken similar action. Also, NMFS has not written specific regulations to allow the issuance of incidental take permits for threatened species. NMFS regulations governing issuance of incidental take permits can be found at 50 CFR 222.22. The commentor is correct when citing the early Federal Register in which NMFS stated that "section 4(d) rules could be written to authorize the use of incidental take permits for threatened species on a species-by-species basis." In fact, this mechanism is the one which NMFS has applied. Regulations for threatened marine and anadromous fish and section 10 of the ESA can be found in 50 CFR 227.21(b), which allows the application of exceptions for endangered species to be applied to threatened species enumerated in specific paragraphs of section 227.4. Consulting section 227.4 and the specific paragraphs reveals that NMFS has authority to issue incidental take permits for Snake River spring/summer chinook; Snake River fall chinook; Central California Coast coho; and Southern Oregon/Northern California Coast coho. Therefore, NMFS can have authority to issue such permits for specified threatened species or stocks.

The commentor listed a number of policies to which the Service must adhere. While listed plants are not required to be addressed by HCPs, the Service must ensure that they are not jeopardized by the issuance of a permit. For that reason, the Services encourage applicants to address plant species to ensure a smoother process. The Services cannot jeopardize any listed species, or similarly any unlisted species to be covered and therefore treated as though it were listed. Adverse modification of critical habitat cannot occur, minimization and mitigation must be to the maximum extent practicable, and must be commensurate with the impacts. Each of these findings can be found in the Biological Opinion or the Set of Findings for the subject HCP and will be reaffirmed for the subject HCP modification.

A number of the policies listed were not relevant to this specific action. For instance, Plum Creek did not cite economic considerations for failing to utilize an alternative land approach that would require additional supporting economic information.

Regarding monitoring, a number of the commentor's points seem fairly logical, but have been taken somewhat out of context. An HCP must specify what steps the applicant will take to monitor, minimize and mitigate the impacts that will likely result from the taking. These three categories of steps (minimize, mitigate, and monitor) are listed as a set. Where minimization is particularly robust, less mitigation is required; where minimization and mitigation are particularly robust, less monitoring is required. Many of the sections cited by the commentor are listed in the Handbook following the introductory statement that "the following steps are logical elements for consideration in developing HCP monitoring programs for regional or other large-scale HCPs:" The HCP Handbook also states that monitoring should be as economical as possible. "Avoid costly monitoring schemes that divert funds away from other important HCP programs, such as mitigation."

The handbook further states that "The FWS and NMFS also have a responsibility to monitor the implementation and success of HCPs. The Services may agree to specific monitoring responsibilities under the HCP, IA, or as part of the incidental take statement issued in conjunction with the section 7 biological opinion. Even if not specified in this manner, the agency still has the responsibility to monitor compliance with the terms of particular HCPs, including any adaptive management commitments incorporated into the HCP, and the section 10 program generally. The handbook concludes this section by stating "Not all of the above steps are necessary for small-scale, low-effect HCPs, and should only be used as appropriate." The Service notes however, that in this specific HCP, monitoring is contained for a number of different components and forms the basis for adaptive-management provisions.

A number of the listed policies did not pertain to forestry HCPs such as the subject HCP. Mitigation habitat does not need to be permanently protected where the impacts are not permanent. This is a concept which is more applicable to HCPs which involve the permanent loss of habitat to development. The same is true for the concept of "replacement habitat".

In the case of forestry HCPs, minimization is common and mitigation lands are the very lands upon which the impacts are occurring. Therefore, the proximity, habitat type, and species present are less of an issue than with development HCPs.

29. Comment on Precedents Set by Existing HCPs: The commentor lists some existing forest HCPs and other actions, which have gone beyond the norm to begin meeting the goals and standards in his checklist. The commentor lists actions such as the use of independent scientific reviews; tree retention along intermittent streams; limitations on the use of broadcast burning to protect soils and woody debris; begin to describe the specific silvicultural methods that will be used on the properties; account for relationships between timber stand definitions and wildlife; use of 70-year timber rotations; use of selective forestry; monitoring of water temperatures, substrate quality, large woody debris recruitment, and channel characteristics of streams; and maintenance of citizens' enforcement rights.

The commentor also cited an HCP in which the applicant agreed to survey for and protect all northern spotted owl nest sites over time, including any new sites, which become established. Likewise, they agreed to provide habitat for three breeding pairs of northern goshawk, even though only one active nest site existed when the HCP was initiated.

Services' Response: The Services note that many of these precedents for "more-effective" mitigation were provided by the subject HCP including peer review of 13 technical papers, retention of trees along intermittent and, in many cases, seasonal streams; limitations to broadcast burning and herbicides; descriptions of innovative silvicultural techniques and use of selective harvesting techniques; harvest rotations (where even-aged management is utilized) are expected to vary between 65 and 120 years depending on site and species; selective harvest techniques; monitoring of the parameters listed by the commentor as well as a number of parameters which were not listed; and also maintained all the rights citizens had without the HCP.

With respect to specifying the silvicultural techniques the Services note the increased benefit wildlife resources obtain from the specification of the results of those treatments rather than committing to merely conducting those actions as described. For instance, Plum Creek guarantees that there will be certain amounts of forest structural stages on their ownership. If they cannot achieve those amounts using the initial set of silvicultural regimes, they will be required to make adjustments to their silvicultural regimes to achieve the results committed to in the HCP.

With respect to one of the cited HCPs, the commentor did not understand the prescriptions committed to and confused habitat protection with seasonal protection of nest sites. While reliance on seasonal protections as a primary measure worked fine for those species and that HCP, the Services are concerned that some view previous HCPs as "setting a standard". We believe that each HCP is unique and must be viewed as a whole, including the surrounding landscape and other contextual factors. The Services believe that this HCP has appropriate retention of old growth and owl habitat, riparian buffers, application of adaptive management, peer review of science, and comprehensive monitoring and research. The Services view the subject HCP as being appropriate for its situation and reserve judgement of other HCPs in different situations for the appropriate time and place.

J. DONALD AND LINDA PARKS

- 1. Comments on Original HCP and Baseline Conditions:** This revision to the subject HCP incorporates the assumption of the original HCP that biological things are going well in the entire planning area (including the national forest lands) and that allows Plum Creek to continue business as usual. The Fish and Wildlife Service appears quite content to preside over this sham, not being willing to speak up that the emperor has no clothes on. Things are not going well, old growth dependent species such the spotted owl and the marbled murrelet are in very real trouble. In recognition of this fact, National Forest lands are currently producing very little timber, while Plum Creek logging continues unabated (under the cloak of this HCP).

Services' Response: See response to comment 36 in Muckleshoot Indian Tribe's letter (C.1, 36) and responses to comments 7 and 11 in Sierra Club letter (F, 7 and 11).

- 2. Comment on Old Growth and Unforeseen Circumstances:** In order for this HCP to perform its intended function, to help recover (or not otherwise further degrade) endangered old growth dependent species, all the elements must work perfectly as defined at the start of the 50 year planning period. There is no room for the unforeseen. The Forest Service may not cut any timber and forest fires are ground ruled out of scope to the planning horizon. This underlying assumption is very shaky at best. This plan needs to be revised to ensure that current old growth habitats are not further degraded and/or fragmented. These habitats ought to be increased.

Services' Response: Unforeseen and Extraordinary Circumstances are addressed in the HCP (see Sections 5.3.1 and 5.3.2, and Appendix 10, Section 8.0 of the Implementation Agreement), in the DEIS (see Section 2.9), in the FEIS (see pages A-106 to A-109), and in the Record of Decision. These issues are also discussed in detail in the Biological Opinion and other documents prepared in support of the HCP. The HCP and Implementation Agreement provide specific procedures to deal with Unforeseen Circumstances. First, the HCP and Implementation Agreement provide for monitoring (HCP Section 5.0) and for modifications through watershed analysis and other forms of adaptive management (HCP Section 5.4). Section 8.0 of the Implementation Agreement describes the process that will be followed if Unforeseen Circumstances arise. In enacting section 10(a)(2), Congress intended that the Services provide long-term assurances to a permittee that the terms of the plan (i.e., HCP) would be adhered to and which further mitigation requirements would only be imposed in accordance with the terms of the plan. In light of this legislative intent, the Secretaries of Interior and Commerce established a "No Surprises" Policy to guide implementation of the requirements that an HCP contain a mechanism to address Unforeseen Circumstances. Consistent with this policy, the Implementation Agreement provides that the Services can seek further mitigation from Plum Creek in cases of Extraordinary Circumstances or information that warrants revising the plan to avoid appreciably reducing the likelihood of survival and recovery of the affected species in the wild. Also, see fire/windthrow response to comment 13 in Sierra Club letter (F, 13) and Mountaineers Comment 7 (G, 7).

This plan addresses current old growth habitats and maintains them at approximately the same level. The increase in foraging/dispersal quality habitat will ensure that these habitats are not fragmented. Also, the amounts of suitable habitat improve to levels which are considered adequate to provide for percolation (connectivity) at the landscape scale.

- 3. Comment on No Surprises and Off-Site Mitigation:** The basic concept of no surprises for the land manager is quite absurd. Given what we have learned over the last 25 years, what makes anyone think that we won't learn a number of significant things in the next 50 years that will impact fish and wildlife? This plan is business as usual and perfectly brings forward the philosophy of resource management over the last 100 years. Wood fiber volume outputs are given certainty while fish and wildlife populations take on all the risk. National Forest lands provide all the mitigation, while Plum Creek lands provide next to none.

Services' Response: See responses to comments 10 and 19 in Sierra Club letter (F, 10 and 19) and response to comment 8 in American Land Alliance letter (I.I, 8).

- 4. Comment on HCP Boundaries and Off-Site Mitigation:** The HCP planning area boundaries should be revised to exclude solid blocks of national forest lands. Plum Creek can not continue to hide behind national forest mitigation. Plum Creek must produce their own mitigation actions.

Services' Response: See response to comment 5 in Alpine Lakes letter (E, 5).

- 5. Comment on Buffers:** This HCP must be revised to expand protection for riparian zones on all intermittent and perennial streams and to assist in salmon recovery and provide for biological integrity. This buffer ought to considerably exceed the current requirements called out by the state forest practice regulations and ought to be similar to the buffers now called out by the Northwest Forest Plan for national forest lands covered by that plan FEMAT guidelines).

Services' Response: See responses to comments 26, 35, 36, 50, 53, 57, 61, 63, 67, 70, 81, 84, 86, and 87 in Muckleshoot Indian Tribe's letter (C.I, 26, 35, 36, 50, 53, 57, 61, 63, 67, 70; and C.II, 81, 84, 86, and 87); response to comment 2 in Alpine Lakes letter (E, 2); and response to comment 20 in Sierra Club letter (F, 20). Buffers do exceed State regulations and approach requirements of FEMAT.

- 6. Comment on Sawmill Creek:** Sawmill Creek in particular deserves additional protection through the HCP. Existing fingers of old growth along Sawmill Creek should be protected by Plum Creek in this plan in addition to the protections of the adjacent national forest land. Wider buffers must protect both sides of the Creek as spotted owl and marbled murrelet habitat.

Champion, Wolf and McCann Creeks should in particular be protected with wider riparian buffers.

Services' Response: See response to comment 23 in Sierra Club letter (F, 23).

- 7. Comment on Roads:** Road construction and reconstruction must be restricted on steep slopes with even moderate erosion potential. Where timber access involves high-risk roading, alternate access methods must be considered such as helicopter yarding. Roads with culverts that impact fish passage must be replaced with fish friendly facilities.

Services' Response: See responses to comments 12, 14, 36, 48, 49, 51, 52, 57, 75, 90 in Muckleshoot Indian Tribe's letter (C.I, 12, 14, 36, 48, 49, 51, 52, 57, 75, and C.II, 90); response to comment 20 in Sierra Club letter (F, 20), and responses to comments 2 and 3 in American Land Alliance letter (I.I, 2 and 3). The Services note that Plum Creek assesses alternatives for access on a case-by-case basis consistent with watershed analysis and other requirements we have imposed through the HCP.

- 8. Comment on Owl and Murrelet Requirement:** The HCP must incorporate a management requirement of no net reduction of spotted owl and marbled murrelet nesting, roosting and foraging habitat across the planning area that excludes solid blocks of national forest lands.

Services' Response: See responses to comments 8, 9, 10, and 11 in Sierra Club letter (F, 8, 9, 10, and 11). The Services note that Plum Creek is only responsible for actions and resulting conditions on their HCP-covered lands. Conditions on National Forest lands are not part of HCP.

- 9. Comment on Economics:** On page 3-13, the HCP states that between 36,000 and 42,000 people (2% of total employment) were employed 'in the lumber and wood products sector in this State. This data is somewhat in error. In 1997, the annual average lumber and wood products covered employment level was 34,692 or 1.4% of total employment. Source: Employment and Payrolls in Washington State by County and Industry, prepared by Washington State Employment Security, Labor Market and Economic Analysis Branch, 1997 Annual averages, January 1999.

On page 3-13, the HCP states that Kittitas County had approximately 200 people employed in lumber and wood products sectors between 1986 and 1993. This statement is somewhat misleading and overstates the importance of timber to the Kittitas county economy. County employment levels in covered lumber and wood products (SIC 24) have not reached 200 since 1987. In 1997 (SIC 24) employment was 125 or 1.1% of total covered employment. Source: Employment and Payrolls in Washington State by County and Industry, prepared by Washington State Employment Security, Labor Market and Economic Analysis Branch, 1986-1997 Annual averages.

Services' Response: Thank you for this information which is now reflected in the FSEIS.

- 10. Comment on Future Vision:** This HCP must look 50 years into the future and not just be a vehicle to extend current practices. Plum Creek's actions have been a big disappointment and an embarrassment in its land management practices in past years. Destruction of roadless areas and continued logging of late successional habitat continue to this day. This HCP should direct practices that will be considered visionary in 2049.

Services' Response: Thank you for your comment. The Services believe this HCP is far more than current forest practices. This HCP begins with a legacy of past management inherited from the previous company. The Services note logging effects are still visible on the landscape from 1989 and before. Since becoming a timber company in 1989, Plum Creek has attempted to live up to their motto "Leaders in Environmental Forestry" and have conducted "visionary" silvicultural practices. The Services hope they continue to seek out the advice of experts such as Dr. Jerry Franklin and incorporate such recommendations into their corporate culture. The Services also hope Plum Creek will be harvesting late-seral habitat for a long time to come, as that means they are using a combination of selective harvests and long rotations. Companies on shorter rotations with more aggressive harvests have no late-seral habitats to harvest and certainly have no portions of their ownerships that would be considered "roadless areas" by so many people.

K. CHARLES A. PHILIPS

1. **Comment on Holes:** When I review a plan I expect to give a few (10-15) substantive comments that might need changing. This plan is full of holes and I feel like I am doing the editing, not reviewing. Preparers should do a better job before sending out a draft. Causes the reviewers a lot of work and reduces the credibility of the preparers.

Services' Response: The Services do not agree with the Commentor's assessment of the plan. The document being reviewed was a draft Supplement to the EISs prepared for Plum Creek's HCP. As such, much of the information on specific issues related to, for example, species and habitat, were only briefly summarized in this document. The Services note that all of the documents (i.e., HCP, HCP DEIS and FEIS, ROD, and Biological Opinion) referred to in this supplemental document have been incorporated by reference.

2. **Comment on Lack of Clarity:** There has been lots of work gone into this plan. Likely the information is available to do the plan. If data available was presented as it should be--I think the HCP process and this plan is likely a good process for meeting the law. Where this plan protects habitat and shows how that is done, I applaud PLUM CREEK. The decisions of management seem sound--To bad we cannot understand what the effects and consequences are. (was lack of clarity and science done on purpose?).

Services' Response: Again, the Services believe that much of the information and "clarity" requested by the Commentor is provided in the documents referred to in the above response. The Services note that all documents related to Plum Creek's HCP, Implementation Agreement, and NEPA documentation have undergone public review, and that the scientific underpinnings for all of the documents (i.e., Technical Reports and species surveys) have been peer reviewed as well. The Services believe these are adequate and appropriate.

3. **Comment on Document Quality:** The USFWS reviews biological assessments (BAs) of projects for meeting the Threatened and Endangered Species Act. Team I meetings have been established to make sure BAs present a true and clear picture as we understand it using the best science available so effects to make determination calls can be as accurate as possible. I ask USFWS officials to meet the same level of assessments for their own documents or for other ownerships as they require of the Forest Service and the same level of disclosure and honesty. The Draft Supplemental HCP Plan for Plum Creek I just reviewed does not meet the same level of assessments required of the Forest Service. This document is very poorly written. Following are my comments more specifically.

Services' Response: The Services rely on EPA to judge the adequacy and quality of documents related to environmental impact statements.

4. **Comment on Purpose:** Why is this HCP being modified? This is not clearly stated anywhere in the introduction of this document. My understanding is that this modification is requested because the United States Government has approved a land exchange between the United States Forest Service and Plum Creek. (Reference legislation). This land exchange was based on the information in the Plum Creek HCP and the FEIS Snoqualmie Pass Adaptive Management Area Plan.

Services' Response: Plum Creek's HCP contemplated that lands managed under the HCP and Incidental Take Permit (ITP) would likely change as a result of future land exchanges with the United States Government. Both the HCP and its associated Implementation Agreement (IA) provide procedures and criteria for modification of the HCP to accommodate such exchanges. As stated in the Introduction on Page 2-1, second paragraph, "Consistent with the procedures and criteria set forth in

the HCP and IA, Plum Creek has submitted a request to modify the HCP to accommodate the potential land exchange. Plum Creek's request is accompanied by a modification to the HCP, which describes in detail the modification and analyzes effects of those proposed modifications." The HCP modification document and SDEIS are based, in part, on the DEIS for the proposed land exchange (I-90 Land Exchange DEIS 1998), Plum Creek's HCP and HCP DEIS and FEIS, the Biological Opinion (prepared by the Fish and Wildlife Service), the NWFP, and the Snoqualmie Pass Adaptive Management Plan (SPAMA), all of which are incorporated in the SDEIS by reference.

- 5. Comment on SPAMA and Term "Strict:"** Page 1-5 First Paragraph under 1.4.2. "...it is important to reiterate that lands obtained by the Forest Service through the I-90 Land Exchange must be managed consistent with the strict requirements of the Northwest Forest Plan." First the word "strict" is a interpretation and is not what the direction is for the NW Plan and therefore should be deleted. Second this sentence should be followed by a sentence that states the FEIS Snoqualmie Pass Adaptive Management Area Plan is completed according to the NW Plan and will provide specific direction for the acres received by the Forest Service. You choose the words but the point is to identify the plan is in place.

Services' Response: The word "strict" has been deleted. The following has been added to clarify Forest Service management options for lands received following the land exchange. "A part of the National Forest System Lands within the HCP Planning Area are also managed under the Snoqualmie Pass Adaptive Management Area Plan (SPAMA), prepared under the direction of the NWFP."

- 6. Comment on SPAMA:** Page 1-6 under 1.4.3. This is the place to identify and HCP or other plans that are for conservation of critters. The Snoqualmie Pass Adaptive Management Area Plan is such a plan and should be identified in this section and a short bit about it as you have done other plans. You may want to say how this is like a HCP plan and not. You may want to say that this plan will likely be added if needed to account for the land exchange acres received and lost.

Services' Response: As you will note, Section 1.4.3 specifically addresses other HCPs relevant to the Planning Area. The Snoqualmie Pass Adaptive Management Area Plan is not an HCP, and is therefore, briefly addressed in Section 1.4.2.

- 7. Comment on Future Listed Species and Lynx:** Page 1-6 under 1.5. The criteria on identification of additional listed threatened and endangered species and how they will be handled. Like the LYNX.

Services' Response: The Services are unsure of what the Commentor meant by "criteria for identification." We assume the Commentor is referring to procedures to add species to the permit in the future. Other listed, and unlisted vertebrate species in the Planning Area (i.e., those not currently listed on the ITP) are addressed in the HCP, the HCP DEIS and FEIS, Biological Opinion, Anadromous Salmonid Unlisted Species Analysis and Findings for the Plum Creek Timber Company's Habitat Conservation Plan and Unlisted Species Assessment, (prepared by the National Marine Fisheries Service), and in the Unlisted Species Assessment, Analysis of Effects on Unlisted Species from Implementation of the Plum Creek I-90 HCP, (prepared by the Fish and Wildlife Service). In the latter document, lynx are addressed specifically on pages 28, 29, and 70. They will also be addressed in a Biological Opinion at the time of listing pursuant to the Act.

- 8. Comment on SPAMA:** Page 2-1 under alternative 2 of 2.2. This alternative will be managed under the NWFP and the site specific Snoqualmie Pass Adaptive Management Area Plan. Be sure you make that clear. By this time it appears the Snoqualmie Pass Adaptive Management Area Plan is not a accepted plan by its being left out so often. What do you say?

Services' Response: Additional wording has been added to Alternatives 2 and 3, on page 2-1, to indicate that SPAMA will also be used to manage Forest Service lands. Nevertheless, use of NWFP was sufficient as SPAMA is but a component of the NWFP.

- 9. Comment on No-Action Alternative:** Page 2.2. As a result of this legislation Alternative A is not a viable alternative but the baseline of information taken from the original Plum Creek HCP to assess the effects of Alternative B and C. This should be so stated so it is clear and understood. Leading people to believe that a land exchange is an option that a decision can be made on is misleading assumption 1) should read that conditions before the land exchange occurred.

Services' Response: As discussed earlier, not participating in the land exchange remains an option as Plum Creek is not mandated by the Legislation which directs the Forest Service to exchange the lands. See Muckleshoot Indian Tribe comment #44 (C.I, 44)

- 10. Comment on Forest Service Ownership:** I do not know where this fits or the wording but the concept that by its omission you are misleading people in the beginning. That as a result of this HCP management, the Forest Service lands will have changed management options. For example the management of old growth for spotted owls will be different when Plum Creek reduces habitat and that the management of riparian habitat along streams effects the effectiveness of streams on USFS above or below plum creek lands. These effects will be identified in later sections. The reason this is important is that 45-55% of the lands in this document are either under or will be under the USFS ownership. It should be clearly stated that the USFS ownership is the largest single ownership in this planning area.

Services' Response: The ownership pattern in the Planning Area before and following the I-90 Land Exchange is discussed in detail in the DSEIS Introduction and is illustrated in Table 1. Land Use and Land Ownership in the Planning Area is also discussed in Section 4.2 in the Environmental Consequences section of the DSEIS. The ownership pattern that would result for each of the alternatives is shown in Table 2. These descriptions clearly show that the Forest Service is the largest landowner in the HCP Planning Area.

- 11. Comment on SPAMA:** Page 3-2 Second Paragraph. This document identifies some wilderness areas but why not say and the Snoqualmie Pass Adaptive Management Area Plan area as well? After all one of the goals of the AMA plan was old growth forest.

Services' Response: SPAMA has been referenced at page 3-2.

- 12. Comment on Multiple Use:** Page 3-3 last paragraph before 3.3. "Federal lands are used for a number of activities such as timber production and recreation." This seems misleading or like there is some agenda attached when on previous page 3-2 it is stated more clearly "Federal lands are managed for multiple uses including commodity production, watersheds, recreation and wildlife." This last statement is much more correct.

Services' Response: The "misleading" sentence on page 3-3 has been replaced with the sentence found on page 3-2.

13. Comment on Recreation and Wildlife: Page 3-6 first paragraph. “Predominant land use ... Recreation and wildlife uses are big. Most acres receive recreation use and wildlife uses it all. In fact these two are more dominant uses on more acres in this basin than the ones you mention. Page 3-16 has or should show information to show recreation as a dominant use.

Services’ Response: Recreation and wildlife have been added to the list of predominant uses.

14. Comment on Lynx: Page 3- 10 first Paragraph. Where is Table 11 and 12? Since I cannot locate these tables I do not know if the Lynx is on them. Need better analysis of Lynx than I see so far.

Services’ Response: As stated in the DSEIS, Tables 11 and 12 are located in the HCP DEIS. Information on Lynx is provided in other documents incorporated by reference to the DSEIS. Also see response for Future Listed Species and Lynx above (Phillips comment 7).

15. Comment on Number of Streams: Page 3-13 Last paragraph of 3.8. This paragraph is unclear. Something is wrong with the number of fish bearing streams as defined.

Services’ Response: The table referenced in the DSEIS is Table 28A in the HCP Modification document. It shows 324 miles of fish-bearing streams as defined as DNR stream types 1, 2, and 3. With total stream miles of 3,266 in the HCP, 10% are therefore fish-bearing. On Plum Creek lands, there are 86 miles of fish-bearing streams, which is 27% of the total 324 miles of fish-bearing streams in the HCP. See Response to Muckleshoot Indian Tribe Comment 41 (C,15).

16. Comment on Recreation Data: Page 3-16 top of page. The data quoted for recreation is old by 10 years. The Forest Service should have some better numbers to better portray the picture today. The Forest has the most snowmobile use in the state and lots of off Road vehicle use. These need to be incorporated into the affected Environment so if Plum Creek is planning to allow those items the effects can be shown.

Services’ Response: See response to comment 15 in Wenatchee National Forest letter (B.II, 15).

17. Comment on Road and Trail Density: I see no mention of the miles of roads or trails on Plum Creek now or what is planned for the future. The density is use full to determine effects on Threatened and endangered species.

Services’ Response: It is the Grizzly Bear Recovery Zone in which densities are explicitly addressed. In other areas, density will be controlled indirectly by other constraints such as sediment budgets.

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

18. Comment on Outline for Consequences: When one is displaying consequences they should be done in a consistent manner, using quantitative information when available and qualitative information if quantitative data is not available. Following is a outline of items to be covered under each resource. As now written the data under resources and Alternatives is inconsistently done (both in order of information and in what is presented) — leading to misleading consequences and statements. Evaluations that are inconsistent are viewed as hiding things and questions of honesty and integrity arise. Government agencies and timber companies do not need this kind of ideas added to their image.

Alternative 1:

- describe the standards and guidelines that the HCP will implement for the resource being discussed. show acres to be applied.
- describe the direct and indirect effects or consequences for the area the HCP S&Gs is covering.

- describe other land owners standards and guidelines. show acres to be applied.
- describe other land owners direct and indirect effects and the area.
- describe cumulative effects or consequences for the whole planning area.

Alternative 2

- Follow process as described under Alternative 1.
 - 1a. add in differences from Alternative 1 of HCP if any, if none state so.
 - 1b. describe standards and guidelines for 10,000 acres to managed differently.
 - 2a. add in differences in consequences of HCP guidelines if none state so.
 - 2b. assess the effects or consequences of this new section
 3. add in differences from Alternative 1 if none say so.
 4. assess the effects or consequences of changed acres.
- discuss differences in cumulative effects.

Alternative 3

- Follow process as described under Alternative 1.
- Reference S&Gs.
- Due to acres changing what are changed effects on Plum creek lands.
- Reference S&Gs and the acres changing by allocation.
- Due to acres in allocations changing, what are the changed effects.
- discuss differences in cumulative effects. If no changes from Alternative 1 then likely data used is not specific enough or assessment is to general as many thousands of acres should have a effect difference.

Services' Response: Thank you for your comment. The steps in the outline above were already incorporated through the habitat-modeling process.

- 19. Comment on Alternative Comparison:** Page 4-8 4.2.3. How are alternative 2 and 3 alike and not alike? In reading what is under Alternative 2 and 3 this was unclear. In review of Table 2 some differences were identified. Alternative 2 page 4.7 and 4.8 says nothing about compatibility of Plum Creek Management with Forest Service. Seems to be some statements to make the two alternatives comparable are needed. (see lead in process for consistency of presentation).

Services' Response: The similarities and differences among the alternatives are addressed in the DSEIS in Section 2.2 (Alternatives Considered and Analyzed). Under Alternative 2, lands acquired by Plum Creek from the Forest Service would be managed by Corporate Standard Management Practices (Section 1.2.3; HCP), Environmental Principles (Appendix 2; HCP), Washington State Forest Practices Rules and Regulations, and all other local, State, and Federal laws and regulations governing the management of forest lands. All other lands in the HCP Planning Area previously "covered" by Plum Creek's HCP and not part of the land exchange would continue to be covered by the HCP.

- 20. Comment on Term “Complimentary:”** Having read the SPAMA and the road access EA and BE for Plum Creek and the effects, the following statement is untrue “by implementing standards and guidelines that are different but complimentary to the standards and guidelines in the NWFP.” I saw some things that are not complimentary and some that were. Please rewrite to demonstrate conclusions.

Services’ Response: The Services’ believe that the Commentor has taken this statement out of context. The entire sentence reads, “Plum Creek’s management strategy would ‘tier’ off the measures outlined in the NWFP and ACS by implementing standards and guidelines that are different but complimentary to the standards and guidelines in the NWFP.” The sentence does not conclude that there are no differences between the two strategies, there are differences. The conclusion follows in the next sentence, “This strategy would increase the potential success of the NWFP and reduce cumulative effects by ensuring the HCP’s compatibility with adjacent National Forest System lands.

As many reviewers know, the intent of SPAMA is to provide for organisms associated with late-successional forests, and also contribute to critical wildlife connectivity objectives within the AMA. Consistent with Congressional direction, and the NWFP, Plum Creek’s HCP seeks to conserve the ecosystems in which species depend. By addressing all possible habitat types that exist in the Planning Area, and by association, all species that use those habitats. Plum Creek’s HCP provides mitigation for all vertebrate species that may use the Planning Area. The HCP was designed to adequately address biological needs of more than 285 vertebrate species. By considering their habitat requirements, the HCP provides early protection and, may help prevent subsequent declines and ultimately the need to list such species, or designate critical habitat in the Planning Area should listing occur.

The approach outlined in Plum Creek’s HCP is considered to be an ecosystem-management approach because it focuses on components of the ecosystem and their functions, and “looks” across the entire landscape to determine how these components were and would be distributed over time. It concentrates on healthy riparian systems; mature forest with structure; habitat connectivity; availability of forest structural stages over time; and special treatments and considerations of special habitat areas. Thus, the Services believe that Plum Creek’s HCP is “different but complimentary to” the objectives of the NWFP and SPAMA.

- 21. Comment on Terms “Minimize” and “Compatible:”** “This strategy would increase the potential success of the NWFP, is consistent with the objectives of SPAMA, and minimizes cumulative effects by ensuring the HCPs compatibility with adjacent National Forest System lands.” The HCP plan and guidelines are somewhat consistent with and somewhat compatible with the NFS but definitely this plan does not minimize cumulative effects. There are less effects due to the HCP but not by any stretch of the imagination “minimizing.” I think the wording in this section gives a LOT more credit to the HCP plan being compatible with the Forest Service than it really is. I challenge this to be demonstrated by some comparison in Table 2 as at this point no information has been presented to justify these statements. It is likely that the Forest Service management and the HCP plans after the land exchange are more compatible than before, due to some of the incompatibilities being eliminated in the exchange.

Services’ Response: The following text has been deleted from the above mentioned sentence, “is consistent with the objectives of SPAMA...,” even though we believe that the HCP has the same goals as the NWFP with respect to conservation of vertebrate species. See following response with respect to term, “minimize.”

- 22. Comment on Term “Minimize:”** The Forest Service goals are for good ecosystem management. Plum Creeks goals are for economic returns through timber management. As per the NWFP these two goals are not minimized through the HCP plan. NOT EVEN CLOSE. Effects on threatened and endangered species are NOT minimized. The Forest Service and Plum Creek are not constrained by the same rules so how does one assume that they are complimentary or minimized for Plum Creek?

Services’ Response: Plum Creek’s HCP was never intended, as suggested by the Commentor, to “minimize the goals” of the NWFP. The goals of Plum Creek’s HCP are: (1) to comply with the requirements of section 10(a)(2)(A) of the Endangered Species Act; (2) to provide Plum Creek with predictability and flexibility to manage its timberlands economically while contributing in a meaningful way to the conservation of listed species and other species that may use the HCP Planning Area, and (3) to provide adequate habitat conditions in the Planning Area so that additional species may not need to be listed in the future. The Biological Opinion, prepared by the Fish and Wildlife Service, on the issuance of a Section 10(a)(1)(B) incidental take permit to Plum Creek, based upon the HCP and Implementation Agreement, in accordance with Section 7(a)(2) of the ESA, concluded that, “After reviewing the current status of the northern spotted owl, marbled murrelet, grizzly bear, gray wolf, bald eagle, and peregrine falcon; the environmental baseline for the action area; the effects of the proposed plan; and the cumulative effects; it is the Service’s biological opinion that the issuance of the ITP, and execution of the IA implementing the proposed HCP are not likely to jeopardize the continued existence of the aforementioned species, and is not likely to destroy or adversely modify designated critical habitat.” In addition, the Anadromous Salmonid Unlisted Species Analysis and Findings, prepared by the National Marine Fisheries Service, concluded, “Considering the possible cumulative effects to anadromous salmonids, the conservation measures identified in this HCP either minimize or mitigate these effects to the maximum extent practicable. Habitat for sensitive life stages of anadromous salmonids will be increased by the measures identified in this HCP.

- 23. Comment on Introductory Text:** Page 4-8 Landform and Geology. First 3 paragraphs belong in affected Environment section. These are general to roads etc. Not consequences.

Services’ Response: These paragraphs are included for introductory purposes only. They are included to set the stage for comparisons among the alternatives, and were never intended to be considered as consequences.

- 24. Comment on Soils:** Page 4-9 under 4.3. 1. “Under the No Action Alternative, the consequences of timber management and harvest on soil compaction, soil displacement, erosion, and nutrient availability would be minimal because of BMPs, RHAs, watershed analysis prescriptions would be implemented. “Please show how this is to be done --- When in the paragraph above it states “Higher risks or impacts are associated with those alternatives comprising larger areas with intensive timber management or greater miles of road with lesser standards.” The previous statement is better guidelines and less miles. I have seen no discussion miles of roads to be built will be more a less. No logic or discussions that would lead to this being “minimized.” Again the right word is likely reduced effects as this is the most area and acres, so the most miles of roads. The minimal effects would be NO ROAD building. Please admit there will be effects. Then those will be reduced by the standards and guidelines and miles of roads built etc. If economic return is the goal then “minimize” effects of roads are likely not a objective. See page 3-14 where emphasis is on dollars for Plum Creek. After all Plum Creek has stock holders and they want profit.

Services’ Response: The use and significance of BMPs, RHAs, and watershed analysis in minimizing the impacts of timber harvest on landform and geology is addressed in Plum Creek’s HCP (pp. 10

and 11; 225 and 281), HCP DEIS (4-8 through 4-12; and 4-78 through 4-80), HCP FEIS, several technical reports prepared in support of the HCP, in the biological opinion, and in the I-90 Land Exchange DEIS. Roads are discussed in detail in EISs prepared by the Mt. Baker-Snoqualmie and Wenatchee National Forests in response to access requests from Plum Creek (USDA Final Environmental Impact Statement for Green River Road Access Requests, 1998; and USDA Draft and Final Environmental Impact Statements for Plum Creek Checkerboard Access Projects, 1998).

The second sentence the Commentor refers to is taken out of context. To appreciate the full meaning of the sentence it must be included with the rest of the paragraph, "Higher risks or impacts are associated with those alternatives comprising larger areas with intensive timber management or greater miles of road with lesser standards. When soils especially susceptible to erosion or disturbance are avoided and/or appropriate timber harvest techniques are used, then minimal impact would occur. In fact, when current BMPs and riparian buffers are present, hill-slope erosion from harvest practices is minimal with no observed delivery of sediment to streams.

- 25. Comment on Landform and Geology:** 4-10 and 11 under 4.3.2. I believe again "minimize" is misused. The planning area would be better for soils and geology under this alternative. But this is not a minimizing of effects. A better description would be that most watersheds in this area will have a better condition than Alternative I but some watershed and drainages will be worse. This is true due to the map of exchange acres on Figure 1, which shows concentrations in some drainages of the 10,000 acres being acquired by Plum Creek. Due to lack of specifics on drainage or watershed effects this alternative could be worse for bull trout or specific wildlife species than Alternative 1. Also it could be better — we or no one knows at this level of analysis. So again saying we are doing all these good things is not justified.

Services' Response: The word "minimize" has been changed to "reduce" where appropriate.

- 26. Comment on Comparison of Alternatives:** 4-11 under 4.3.3. Alternative 3 is not the same as Alternative 1 or the assumptions in Alternative 2 is a bogus analysis. Alternative 3 puts more acres in USFS management and does additional protection of 10,000 acres in the HCP plan. So it is better for the planning area than Alternative 1 and better than Alternative 2. So again Alternative I or 2 cannot be minimizing. This is the best alternative for the watersheds of the 3 shown. I applaud Plum Creek for taking care of the watershed. But effects are not minimized and we do not know specifically where or what they are. Likely they are doing some good for some species of wildlife and fish.

Services' Response: To clarify the similarity between Alternative 1 (No Action) and Alternative 3 (Proposed Action), the first part of the first paragraph under Section 4.3.3 has been modified as described in Forest Service Comment 23 (B.II, 23).

Also, "minimize" has been changed to "reduce," where appropriate under all alternatives.

- 27. Comment on Harvest in Riparian Zone:** 4-13 under 4.5.1. Does this say Plum Creek will log some trees from the riparian zone? If yes, please state this is so. If logging trees from the riparian zone can be done and meet the aquatic management strategy--then that is good.

Services' Response: Limited harvesting in riparian areas is part of Plum Creek's Riparian Management Strategy (see HCP, Section 3.3).

- 28. Comment on Comparison of Water Quality and Quantity:** 4-14 under 6.5.3. Alternative 3 is better than alternative 1 or 2. Less acres with less effects than both plus additional guidelines than under alternative 2. The question we cannot answer is how much better. Again if the assessment of alternative 2 is OK in assumptions then use that assumption in Alternative 3. This also should say that the guidelines for Plum Creek is not as good as the USFS in the same watersheds.

Services' Response: The Services agree that among the alternatives, Alternative 3 [in Section 4.5.3] is the most protective of the Planning Area. The adequacy of management guidelines on Plum Creek's lands and on National Forest System lands is stated clearly under Alternative 2, "However, under Alternative 2 a greater portion of the Planning Area would be managed under the NWFP and ACS. The added protection of water quality provided on National Forest System lands by the ACS may offset the lesser protection that would be provided on Plum Creek's lands under this alternative."

- 29. Comment on Vegetation:** 4-15 paragraph 1 under 4.6. 1. This analysis looks at all land ownerships in the planning area. This is a different analysis than under the other resources when looking only at Plum Creek management. If you choose to do a planning area please break it out by ownership like Table 1. If you do not do this--then the effects of the HCP for Vegetation is being masked. Also show in a Table time intervals so we can see the ups and downs by ownerships over time. Without this breakdown this assessment is misleading as the effects of the HCP plan. In reality, we know Plum Creek lands will not have more old growth in the future and that the acres of early-successional stages may be mostly on Plum Creek. So state this and the effects along with the planning area numbers. BE HONEST and NOT DECEPTIVE.

Services' Response: See response to comment 25 of the Wenatchee National Forest letter (B.II, 25).

- 30. Comment on Vegetation Table:** What fun! Turn the page and there is Table 3. Now break that out by ownership and we can see what is really going on and why the "take permits" for owls and murrelets. The address the consequences both for Plum Creek lands and for the planning area. How come Table 3 is not referenced in discussion in Alternative 1, 2 or 3? Same comments for Alternative 1,2,3 in above paragraph.

Services' Response: Table 3 is referenced to the alternatives under Section 4.6, Vegetation, in the last sentence of the Introduction on page 4-15. This sentence states, "These structural stages range from stand initiation to old growth forests and are defined in Section 2.2.3.4 of the DEIS (HCP DEIS 1996) and are summarized by alternative in Table 3." The Service's are not clear as to what "Same comments for Alternative 1, 2, and 3 in above paragraph." is referring to.

The Services agree that, among the alternatives, Alternative 3 is the most protective of vegetation in the Planning Area. The adequacy of management guidelines on the Permittee's lands and on National Forest System lands is stated clearly under Alternative 2.

See also HCP Modification document Figures 46A and 48A.

31. Comment on Vegetative Assessments: Looking at the structural conditions of the forest and looking at special or unique habitats is two different vegetative models or assessments. So they should follow the process for assessments as discussed at beginning of Chapter 4.

Services' Response: Generally, all habitat modeling followed the basic outline presented in the comments directed at the beginning of Chapter 4. The Service also notes that unique habitats are protected by the HCP and should not change as a result of the land exchange modification.

32. Comment on Special Habitat Buffers: Harvest deferrals are to be done next to special habitats--Is that one tree? five feet? or what? Does this deferral protect the integrity of the site and critters? How so? There are hundreds if not thousands of ephemeral and permanent ponds and wetlands that are very small Are you going to protect all these sites from roads also? Please be clearer on what is planned so effects on species can be determined. Without more specifics it is impossible to tell if these sites are having their integrity and function maintained.

Services' Response: Harvest deferrals and other plans proposed for the Planning Area on Plum Creek's lands have been addressed in the HCP, the HCP DEIS, HCP FEIS, the Biological Opinion, Record of Decision, Road Access DEISs, and the I-90 Land Exchange DEIS. The Services refer the Commentor to these documents for specific information. Each of the special habitats has its own set of prescriptions, which sometimes vary by size or type of habitat.

33. Comment on Introductory Text: Page 4-17 under 4.7. First 6 paragraphs belong in the "Affected Environment" section.

Services' Response: The Services believe that this information is important and necessary at this point because it provides the reader with a brief overview of the wildlife provisions in Plum Creek's HCP.

34. Comment on Wildlife Impacts: Another impact to wildlife is loss of food or forage species and numbers. Loss of food by projects is a indirect effect.

Services' Response: See response to comment 27 in Forest Service Letter (B.II, 27).

35. Comment on Baseline: Conversely, changes in habitat that decrease habitat for some species increases habitat for other species. What is the baseline for critters for this planning unit under the assumptions in this section? Once a baseline is established of what would be viable or best do a comparison analysis.

Services' Response: See response to comment 7 in Sierra Club letter (F, 7).

36. Comment on Assumptions: Second paragraph-- assuming about Forest Service management. This is a basic assumption that should be way back in the introduction. It is applicable for all resources and funny how it just shows up now. This and AMA plan should be baseline information just like any laws or rules from state of federal. Glad to finally see this.

Services' Response: The assumptions listed under Section 4.7 Wildlife, are also discussed in detail in the HCP and HCP DEIS and HCP FEIS, and they are discussed in the HCP modification document that accompanied the DSEIS. For clarity, the paragraph indicated in the comment has been added at the end of Section 1.4.2 The Northwest Forest Plan and Related Plans or Projects.

- 37. Comment on Assumptions Regarding Vegetation:** Paragraph three--This is also assumptions for vegetative model and other resources. Why just under wildlife?

Services' Response: The assumptions mentioned in paragraph three were used in all applicable analyses in the HCP and HCP modification document. The paragraph has been altered to more clearly explain the modeling process (see Section 4.7).

- 38. Comment on Background Text:** Page 4-18 under 4.7. 1. 1. Background--Should all this be in "Affected Environment" section.

Services' Response: This background information was included because it relates directly to the Permit species addressed in the HCP, HCP DEIS and HCP FEIS. Although this information is provided in detail in the above mentioned documents, it was provided to help the reviewer understand the relevant issues and to assist the reviewer when comparing the alternatives.

- 39. Comment on Descriptive Text:** Page 4-19 Description of Alternative--Conservation Measures should be in Description of alternatives section. This was also missing for other resource sections. I suggest you follow formats developed for such products from other agencies.

Services' Response: See Response above in Phillips Comment 38.

- 40. Comment on Owl Carrying Capacity:** Page 4-19. The total habitat for spotted owls may be greater in 2045 but because of distribution and quality of habitat will the populations be better and reproduction be taking place?

Services' Response: The results of the Resource Selection Probability Function modeling indicate that potential numbers of owls are essentially the same in year 2045 as in 1996. However, should the observed numbers fall below 80 percent of the projected numbers at any point in the HCP, additional mitigation will be provided through adaptive management in the form of additional deferrals, lengthened deferrals, or movement of deferrals.

- 41. Comment on Numbering System:** Page 4-20 and 4-21. The numbering system changed from Vegetation and before to Wildlife section. WHY?

Services' Response: There are several issues that require specific discussion under Environmental Consequences for the spotted owl. These issues include Deferrals, Amount and Type of Habitat, Distribution and Patch Size of Habitat, and Carrying Capacity. Because of their importance, each was discussed separately for each alternative.

- 42. Comment on Cumulative Owl Effects:** There is no consequences statement for any of the Wildlife Alternatives. Talks about 30 pairs being maintained out of 78? So The consequences is 58 pairs will be ??? by this alternative. When we look at cumulative effects the consequences do not change due to past cutting and planned harvesting by Plum Creek under HCP. Is this right?

Services' Response: Cumulative effects from other actions are the same for each of the alternatives with the exception that there would be greater amounts of Federal lands under Alternatives 2 and 3. Because the HCP, HCP Modification Document, and this SEIS use landscape-level conditions now and in the future, these documents are assessing cumulative impact. Regarding numbers of owls, a carrying capacity of 87 pairs was estimated within the Planning Area for 1996 and 86 for 2045. The Service does not believe the number will change significantly as a result of the land exchange

modification In fact, we estimate 87 and 91 for 1996 and 2045 respectively. Additional analysis will be conducted as the Service prepares its Biological Opinion on this action.

- 43. Comment on Alternative 2:** I do not understand consequences and how USFS and Plum Creek management together or individually effect spotted owls.

Services' Response: Actions such as Plum Creek's deferrals adjacent to important owl sites on Federal lands will complement and support the Federal objectives under the NWFP. Plum Creek and Federal lands will both supply NRF and FD for owls However, under Alternative 2, the amount of habitat retained on newly acquired lands will depend on owl-site persistence and whether adjacent lands are contributing habitat to the extent that greater than 40% of a 1.8 mile radius circle is being maintained. Owl habitat on non-HCP lands would be expected to be harvested whenever sites were abandoned or those lands were no longer considered "restricted" by the 40% threshold.

- 44. Comment on Deferrals:** Alternative 3 same comments as for Alt. 1 and 2. What does "over 11 owl sites" mean? 54? 12? 13? 11.235 ? No cumulative consequences? The HCP may be doing great things and with the land exchange it is likely even better but this document gives no credit just is confused. This is where the USFWS holds the Wenatchee NF captive to levels of assessments as in the AMA plan. This is where the Forest has complained the USFWS is not doing this level for their documents or for HCPs. The old be fair rule is very obvious here.

Services' Response: All of the Above. Deferrals of 11 sites would be guaranteed; however, as in the original HCP where Plum Creek guaranteed to defer habitat around 30 owl sites but actually established deferrals for 32 and later 33 sites, so could Plum Creek exceed 11 sites in this case. The Service appreciates the additional deferrals placed voluntarily. Regarding cumulative effects, see response to Phillips Comment 42.

- 45. Comment on Erratic Evaluation:** Page 4-21. [A]Mount and Type of Habitat. What is the consequences? You show some acre changes by ownership over time--should do the same for owl numbers and vegetation as in Table 4 and 5--this is the erratic evaluation of different items. This is not scientifically or ethically correct. Discussion should include the differences for Foraging and Dispersal versus all habitat versus nesting/roosting/ foraging. Cannot truly display effects without this.

Services' Response: See HCP modification figures 24A, 26A, 30A, and 30bA. Owl numbers cannot be shown by ownership—they are a result of accumulative landscape-level conditions across multiple ownerships. Regarding vegetation, see also Forest Service Comment 25 (B.II, 25). Tables 4 and 5 display amounts of FD, NRF, and total habitat by alternative through time. Differences should be apparent from the titles of these categories as well as from discussions in HCP Section 2.4, Spotted Owl Habitat Types. Additional details can be found in Technical Report #4 titled "Spotted Owl Habitat Descriptions for Plum Creek's Cascades Habitat Conservation Plan"(Hicks and Stabins, 1995).

- 46. Comment on Alternative Comparison:** When Alternative 2 provides the most spotted owl habitat on Plum Creek lands--It makes one wonder on the effectiveness of the rules for owls in the HCP plan. The HCP allows Plum Creek to do more than other laws--Does the HCP plan meet other laws?

Services' Response: Assumptions about continued viability of owl sites under State regulations, and relying on these sites to protect habitat is too optimistic an assumption. Additionally, it seems odd that Plum Creek would place additional deferrals for owls under the partial HCP alternative. If these facts could be corrected, the projected habitat amounts would be best off with the proposed action.

The issue of an overly optimistic no-action alternative was discussed in the FEIS on page A-62. "Current regulations (i.e., 1.8-mile radius management circles) will not avert a reduction in spotted owl habitat, because habitat outside of circles, and above threshold within circles will continue to be harvested by State and private landowners, including the Applicant. The current regulations alternative (i.e., No-Action) displayed in the DEIS was conservative and assumed "no net loss" of circles and owl sites." The Service notes that many sites are currently without protection circles or are expected to lose their protective circles shortly because of documented absence through surveys.

The issue was further discussed on page 10 of the Service's Findings. "The differences between the No-Action Alternative and HCP Alternative in changes in the amount of existing owl habitat through time were compared in the FEIS (section 4.8.1) and BO (see figures 18, 19, 20, and 21, therein). When comparing the modeling of the No-Action Alternative and the HCP Alternative in the FEIS, both would maintain approximately 85 percent of the current number of owl sites over the life of the HCP. However, the HCP is likely better than the No Action Alternative at maintaining the resident owl population due to optimistic assumptions used for the No Action Alternative analysis. In Appendix 2 of the FEIS, the Services explained that the modeling for the No Action Alternative was based on overly conservative assumptions resulting in highly optimistic owl habitat effects results. An active program to survey for owls and document abandonment of sites by owls so the timber can then be harvested avoiding take prohibitions under the Act is an option available to Plum Creek under the No Action Alternative. As many as 14 sites that were included in the No Action Alternative modeling as viable over the long-term are likely candidates to receive 2 or more years of protocol surveys to document absence and could likely be decertified, releasing over 2,000 acres of habitat available for harvest. This was not considered during the assessment of impacts under the No-action Alternative (Services 1996a). Furthermore, as additional sites are found to be vacant, habitat not encumbered by other overlapping owl sites would also be released."

The Services believe that the HCP offers far greater certainty for the spotted owl than would occur in its absence. Unfortunately, it is very difficult to model site-by-site actions which are dependent of future events. Instead, the Services have chosen to assume no change in restricted habitat for comparison to the other alternatives. Realizing that Alternative 2 in the current document suffers from these same considerations leads the Service to believe that Alternative 2 is not as desirable as the proposed action for owls, or for other species relying on mature forest with structure, healthy riparian systems, or special habitats.

The State Forest Practices Rules as well as the ESA provide for authorization of take through an ITP and HCP. The HCP complies with State and Federal Regulations.

- 47. Comment:** I GIVE UP. THIS IS A WASTE OF MY TIME TO TRY AND GIVE FURTHER COMMENTS. THE PLAN NEEDS TO BE COMPLETED PROFESSIONALLY AND USING SCIENTIFIC PROCESSES. UNTIL THAT IS DONE THIS PLAN IS A FARCE IN MY OPINION.

Services' Response: Thank you for your comment. The Services regret Mr. Phillips conclusions. We have made a diligent effort to describe the proposed action and alternatives in an understandable format. We also have described changes which might have occurred since permit issuance in the affected resource categories, but also provided brief overviews of resources for those unfamiliar with the original documents. Most importantly, we have used the best science available to display the consequences of implementing the proposed action or its alternatives. Furthermore, in this document, we have continued to apply that effort by assiduously responding to comments in as thorough and

clear a manner as is possible. We believe the supplemental environmental impact statement has been “professionally prepared”.

L. ROBERT WATTEZ

- 1. Comment on Fewer Requirements:** The commentor stated “As I understand it, Plum Creek wants less requirements, since it has less late successional forest types. I do not believe this would be appropriate. At the very least, the Timber Company should be required to maintain the current riparian buffer strips on all streams, even intermittent ones. This is especially important in the Green River Drainage, and on streams such as Sawmill and Rock Creeks. Given that the salmon situation is so bad, no further damage should be allowed to occur.”

Services Response: The Services concur. The modification of the HCP to incorporate the new land base resulting from the land exchange does not lessen any of the requirements upon Plum Creek. Any changes to the landscape-level or ownership-level forest types is a result of the exchange which changes the percentages of each ownership made up of various forest types, in conjunction with continued management under the HCP which will now be applied to a different set of lands. No decreases in riparian protection are allowed. Plum Creek will continue to be required to provide the high level of riparian protection contained in the original HCP. With regard to the Green River, please see response to Muckleshoot Indian Tribe Comment 1a and associated responses (C.I, 1a) and with respect to Sawmill Creek, see response to Sierra Club Comment 23 and associated responses (F,23).

PUBLIC MEETINGS

During meetings with the public, environmental groups, and Washington Department of Wildlife, a number of issues were raised. Some of these were repeated in written comments, which are included in this FSEIS and are not repeated here. Comments which were not repeated or for which public meeting comments contained additional information or nuances are contained in the summaries below:

M. ISSAQUAH MEETING

1. **Comment on Plants:** Member of environmental groups stated that Federal watershed analysis addresses plants, State watershed analysis does not.

Services' Response: This is true. However, the HCP does not address or provide coverage for plants. Barring a special 4(d) rule, legally defined "Take" of plants on private lands can generally only occur if a person were to "remove, cut, dig up, or damage or destroy any such species on any other area [other than Federal land] in knowing violation of any law or regulation of any state or in the course of any violation of a state criminal trespass law." For the reason that these would not be otherwise lawful activities, these cannot result in the "incidental take" of plants.

All actions of Federal agencies, including issuance of an ITP must avoid appreciably reducing the likelihood of survival and recovery in the wild. The Services will assess this prior to making a decision to issue or deny the permit. This issue is also addressed in the context of culturally sensitive plants in the response to Muckleshoot Indian Tribe letter comment 94 (C.III, 94) and meeting comment 5, as well as responses to Forest Service comments 25 and 26 (B.II, 25 and 26).

2. **Comment on Third-Party Monitoring:** Has the Service considered third-party monitoring.

Services' Response: Yes. The Services considered the benefits and potential problems of third-party monitoring at the time of issuance of the original ITP. Potential problems included funding and possible conflict of interest. The Services notes that third-party monitoring remains an option, especially with regard to compliance monitoring. As examples, the Services point to the ongoing work of three entities. The Tribes, specifically the Yakama Indian Nation and Muckleshoot Indian Tribe, pay close attention to their respective areas. The Muckleshoot Indian Tribe brings watershed analysis and forest practice application issues to the Services attention. The Yakama Indian Nation reviews proposed harvest and road activities and investigates streams for presence of fish. The Washington Department of Fish and Wildlife reviews certain sales to ensure consistency with State regulations. Washington Department of Natural Resources must ensure, for forest practices on lands covered by such an HCP, that such forest practices are consistent with that plan. WDNR does this through a combination of methods. Each Forest Practices application must state that the application is consistent with the HCP. Additionally, it must list the criteria of the HCP for that specific geographic area. Plum Creek has developed, in conjunction with WDNR, a checklist that it uses. Each of those provisions are treated by DNR as though they were part of State Regulations. Their field staff check many of these sales on the ground. All of the above mentioned parties, as well as other entities, have been invited to participate in pre-harvest reviews of sales to be submitted in the coming year. At such reviews, the Company foresters are available for questions. There is already involvement of third-parties and additional involvement opportunities may arise in the future. The Services are always

willing to accept information from the public regarding the activities conducted under this plan. The Services and Plum Creek will continue to discuss and consider the utility of third-party monitoring.

- 3. Comment on Mailing Lists:** The commentor's requested the Services contact each person interested in the HCP whenever such changes as addition of species to the permit were being considered. They are frustrated at how the previous notification made with regard to adding bull trout, i.e., only through the Federal Register notice.

Services' Response: The Services do not plan to keep mailing lists for each aspect of a project. We believe that the Federal Register system, available to all U.S. citizens, is the most effective, fair, and timely manner of notification, and is intended for this type of application. Where appropriate, we often supplement such notices by issuing a news release or contacting local media. In this case, we merely carried out an analysis and action described over a year earlier in an extensive public process. In the future, the degree of change and the impacts from such change will determine whether Federal Register notices are provided, and whether additional outreach tools are utilized.

- 4. Other Comments:** Comments were received regarding planning area boundaries, accuracy of maps, and adherence to land exchange priorities identified in the subject legislation.

Services' Response: Each one of these issues is addressed in the responses to written comments.

N. ELLENSBURG MEETING

- 1. Summary:** Washington Department of Fish and Wildlife primarily gathered information from the Services and Plum Creek by asking clarification questions. They investigated aspects of the HCP and EIS and what the effects of the land exchange would be to allow them to best frame their comments which would follow later. The issue of wildlife reserve trees was also discussed.

Services' Response: The Services appreciate the attention by, and participation of, Washington Department of Fish and Wildlife in implementation of this HCP and in the public-participation process on this HCP modification.

O. MEETINGS WITH TRIBES

The Fish & Wildlife Service and Plum Creek met with the Muckleshoot Indian Tribe on December 16, 1998, near Auburn, Washington. A number of issues were raised and discussed at that meeting. On January 13, 1999, the Service and Plum Creek again met with the Muckleshoot Indian Tribe to answer questions about the draft documents and to exchange information.

On May 7, 1999, the Services met with the Muckleshoot Indian Tribe to discuss issues relating to salmon and issues remaining from previous meetings.

O.I MEETING OF DECEMBER 16, 1998:

- 1. Comment on Access:** The Tribe was concerned that as Federal land decreases, roads are gated. Gated roads bar access by Tribes to traditionally used areas. It also can be a problem for access on specific projects. Although Plum Creek has provided access for Muckleshoot projects such as elk capture for telemetry studies, other timber companies have been problematic at times.

Services' Response: The Services cannot mandate Plum Creek provide access to the Tribes by removing gates or prohibiting use of gates which exclude members of the Muckleshoot Indian Tribe. The Services do however encourage Plum Creek to continue, and expand upon, its working relationship with the Muckleshoot Indian Tribe in regard to a variety of issues, including road access.

2. **Comment on Trails:** The Muckleshoot Indian Tribe has witnessed the destruction of traditional trails by even-aged harvest units. Clear-cutting and skidding obliterate signs of the trails, and what little of the trail that remains visible is covered with debris. Following that stage, a densely stocked regeneration stand also blocks access and hides the trail. By the time the forest is beginning to reach a stage that is passable decades later, most signs of the age-old trail have disappeared with the passing of the decades since harvest.

Services' Response: The Services have entered into discussion with Plum Creek in this regard. This issue is one that can best be handled in the working group meetings established by Plum Creek and the Muckleshoot Indian Tribe. However, this is a topic in which the Services believe it can contribute some ideas and help the Muckleshoot Indian Tribe and Plum Creek develop creative partnerships, in association with the Services.

3. **Comment on Cultural Resources:** The Muckleshoot Indian Tribe made several comments regarding cultural resources, including potential impacts of land exchange and subsequent management under private ownership.

Services' Response: The Services note that the written comments reflected the comments made during the meeting. The Services have responded to these comments in the responses to written comments on the same topics.

4. **Comment on Net Loss of Lands in the Green River:** The Tribes indicated that the land exchange is not beneficial from their point of view. They believe that the transfer of Federal lands to Plum Creek, in conjunction with previous exchanges and the effects of those previous exchanges, will negatively affect the Tribe in a variety of ways.

Services' Response: The Services concede that the exchange is a series of tradeoffs where in general the east side receives marginal benefits and the west side seems to be less well-off with regards to older forest over time, in both upland and riparian forests. Responses to written comments address the issue in more detail.

5. **Comment on Plants:** One of the effects of past and present exchanges, which was discussed during the meeting, but not specifically raised in written comments, was the issue of cultural use of plants. The Tribe believes these are important issues. Many plants which the Muckleshoot Indian Tribe finds culturally significant are reported to depend on old forest, and perhaps sizeable blocks of old forest. The Muckleshoot Indian Tribe asked about the effects these resources would experience from transfer to Plum Creek ownership.

Services' Response: The Services note that many culturally significant plants, such as berries, may also be found in early-seral stages. Other sensitive plants may be found in association with the protection provided for special habitats such as wetlands, seeps, springs, talus areas, and other such areas. Regarding old-forest-dependant plants, the Services expect there may be some decrease in their availability. Old forest will remain in riparian areas and on unexchanged Federal land in the watershed. Larger blocks of old forest may be found following the land exchange in areas such as the Kelly Butte Special Management Area. Old forest will also continue to be found on Plum Creek lands.

However, Plum Creek intends to meet their HCP obligation for mature forest primarily by utilizing a shifting mosaic on their ownership. Such a dynamic system may not be advantageous to all late-seral plant species. The Services therefore concede that there may be some reduction in late-seral plant species to occur as a result of the land exchange. Subsequent modification of the HCP is expected to have little to no impact to such plant species.

We encourage Plum Creek and the Muckleshoot Indian Tribe to work together in protecting important cultural resources such as unique areas with sensitive plant species. The Services offer their assistance in this regard wherever possible.

O.II MEETING OF JANUARY 13, 1999:

- 6. Comment on Summary of Differences:** The Tribe summarized the meeting by establishing three potential philosophical differences between them and the Services: (1) They do not believe there is a net gain to the public. They stated that the Muckleshoot Usual and Accustomed area is west of the Cascade crest and that the exchange may be adverse to Tribe and Tribal resources. They noted there is a net reduction in Federal land in the Green River. (2) They noted that the HCP is designed to provide assurances to the species and the Company. They asked the Services to define species. Does that include evolutionary significant units or distinct population segments such as the Puget Sound/Coastal distinct population segment of bull trout or chinook? (3) They noted that the current land exchange documents and HCP modification documents, and associated NEPA documents, do not consider restoring passage above Howard Hanson Dam. The FEIS produced by the Corps of Engineers is expected to provide fish passage for chinook salmon. The Tribe notes that they already plant chinook, not just coho. They believe there is an underestimation of risk for fish as a result of HCP.

Services' Response: (1) The proposed action involves extending ESA incidental take permit authority to the covered lands. The decision on whether to exchange lands will be made by the Forest Service. We recognize the Muckleshoot Indian Tribe's view of this exchange as a series of tradeoffs. The Services agree with that view. (2) The Services provided certain assurances for all vertebrate species, which include subspecies or distinct populations segments or evolutionary significant units. We did so in return for conservation of such species. However, species will be added to the permit only if such action would not appreciably reduce the likelihood of the species survival and recovery in the wild; furthermore, this does not limit or diminish the Services' Trust responsibility to Native American Tribes. (3) The Services note that passage is not part of the existing situation. However, while it was not foreseen in the original HCP to occur in the very near future, the Services did consider the fact that it could happen. NMFS, in their 1996 analysis, indicated that "Howard Hanson dam presently blocks upstream passage for all anadromous salmonid species." "...fall chinook salmon are currently not known to exist in that section of the Green River and are considered extirpated. There is some chance they will be re-introduced in the future." The Services note that the Tribe outplants chinook and apologizes for the inconsistent treatment of this fact in the past.

- 7. Comment on One Action:** They also noted that the land exchange and modification is really one action.
- Services' Response: The Services note that the two actions are closely related. The separate action of the Forest Service is the action of the actual exchange of ownership. The Fish and Wildlife Service and National Marine Fisheries Service actions are to modify the HCP to accommodate the new land base which results from the exchange.*

- 8. Comment on Assumptions of Federal Land:** The Muckleshoot Indian Tribe notes that the original HCP assumes it is protective of salmon in the context of large amounts of Federal lands in the Green River.

Services' Response: This is true, but the Services also believe that those measures are protective of salmon on the proposed landscape as well.

- 9. Comment on Large Woody Debris:** The Muckleshoot Indian Tribe said that one-half the natural level of wood recruitment would be accounted for in the streamside buffers offered on the west side. The Muckleshoot Indian Tribe said that NMFS' comments to Oregon on the coastal plan said that small streams may provide 40 percent of the potential large wood. Riparian areas along fish-bearing streams may provide about 90% of the potential large wood those riparian areas are capable of producing, but small streams and their buffers will be providing a much smaller fraction of their potential. Muckleshoot Indian Tribe reiterated that the HCP was predicated on large amounts of LWD being derived from Federal lands.

Services' Response: The Services note that a number of factors should be considered in addition to the effectiveness of the interim/minimum RHA measures contained in the original HCP: (1) Fish-bearing streams are being discovered to exceed original estimates; (2) Perennial streams are making up a greater portion of the nonfish-bearing streams than originally thought; (3) Leave trees from harvest units with otherwise unbuffered streams are being left along such streams; (4) Watershed analysis is yielding 50 foot or greater buffers on 50 percent or more of such otherwise unbuffered streams. It is also a matter of scale, the net change in the Basin will be about 3,000 acres and 6 miles of streams. There is not a 1:1 relationship between Large Woody Debris recruitment and fish, even though we know there is a relationship of some sort. This issue is also addressed in responses to Muckleshoot Indian Tribe Comments 26, 63, 65, 66, 67, 68, 69, 71, 80, 87, and 88 (C.I, 26, 63, 66, 67, 80; and C.II, 87 and 88).

- 10. Comment on Green River Statistics:** The Tribe maintained that statistics regarding streams needed to be broken out for the Green River to assess impacts.

Services' Response: The Services concur. Such statistics will be forwarded to Muckleshoot Indian Tribe and included following Muckleshoot Indian Tribe Comment 81 (C.II, 81).

- 11. Comment on Cumulative Impacts:** They also noted foreseeable cumulative impacts should have been addressed.

Services' Response: The Services concur. These issues are further addressed in response to written comments, and hopefully have been satisfactorily addressed in the FSEIS.

- 12. Comment on Slope Stability:** The Tribe is concerned about whether slope stability is adequately considered.

Services' Response: The Services note the self-correcting nature of horizontal measurements, watershed analysis, as well as the involvement of members of the Muckleshoot Indian Tribe technical staff that contribute to consideration of slope stability in the watershed analysis process.

- 13. Comment on Rock Types:** The Muckleshoot Indian Tribe questioned how the rock types factored into the slope-stability assessment.

Services' Response: This comment is responded to in written comment section.

- 14. Comment on Watershed Analysis:** Comments were received regarding timing of watershed analysis.

Services' Response: Most incoming lands are in the Lester WAU where watershed analysis is already done.

- 15. Comment on Quality of Application:** The Muckleshoot Indian Tribe remarked that Plum Creek's application of watershed analysis and overall management practices are superior to other Timber Companies. They noted they still had concerns, but were appreciative of Plum Creek's efforts and cooperative approaches. They said "of all the companies they deal with, Plum Creek has been the most responsive to their concerns."

Services' Response: The Services are encouraged by the dialogue occurring between the Muckleshoot Indian Tribe and Plum Creek. The Services believe such dialogue can only result in improvements to the process and be to the betterment of the resource. The Services believe there is a role for the Tribes to play in implementation of HCPs such as this and invite their ideas.

- 16. Comment on Cultural Resources:** The Muckleshoot Indian Tribe stated that the cultural resources section needs rewriting. They believe the "east side" model developing in cooperation with the Yakama Indian Nation would not work in the Green River. They indicated they would be sending additional comments.

Services' Response: The Services note these issues are addressed in the written comments section.

- 17. Comment on Requests:** Chairman Daniels sent a letter to Plum Creek with a number of resource topics that need to be addressed through discussion working groups.

Services' Response: The Services note that Plum Creek and Muckleshoot Indian Tribe have agreed to establish small working groups, and to have the representatives to those groups report the results of the smaller working groups back to the larger group. The Services support the concept of these discussions.

- 18. Comment on NHPA Consultations:** The Muckleshoot Indian Tribe noted that there is required mitigation for cultural resources through section 106 process established in NHPA with regard to the Forest Service and the land exchange. There are opportunities for cooperative mitigation in relation to exchange lands. They also noted cultural resources includes resources in a broader sense.

Services' Response: The Forest Service is addressing § 106 process as part of the land exchange. The Services note that Plum Creek indicated a desire to work with the Muckleshoot Indian Tribe on a continuing basis and not just limited to the land exchange. These issues are addressed in greater detail in response to written comments 92 through 95.

- 19. Comment on Flashpoints:** The Muckleshoot Indian Tribe noted that phrases such as "benefits to the public" and "exceeding state rules, therefore meeting Tribal Trust Responsibilities" may offend and affront the Tribes.

Services' Response: The Services so note and will avoid the inappropriate use of those phrases in the future and wherever it encounters them in the documents will delete or modify such inflammatory statements.

O.III MEETING OF MAY 7, 1999:

On May 7, 1999, Fish and Wildlife Service and National Marine Fisheries Service staff met with staff from the Muckleshoot Indian Tribe. We identified our respective goals, described the current situation from each of our perspectives, and discussed the proposed action. Previous comments were discussed to ensure clarification. Tribal staff reiterated that the HCP has the potential to influence fish habitat, and thus the fish population, and the fact that fishing is very important to the Tribe.

Staff from the Muckleshoot Indian Tribe provided a history of salmon and steelhead management which included construction of dams, fish traps, hatcheries, and weirs. They described the passage situation and the plantings of salmon which have been conducted in the upper Green River basin. From the tribal perspective, the large amount of effort and expense which has been placed in these activities signifies the importance of Green River steelhead, coho, and chinook to the Tribe. In earlier years, they planted approximately 2 million coho and chinook and 50,000 steelhead per year. In recent years, these numbers have been about 500,000 coho and chinook and 80,000 steelhead. The Services recognized the inconsistent treatment of the situation with respect to Green River Chinook in its previous documents. The Tribe described it hopes for fish passage in the near future. It was agreed that the restrictions on public access and concerns for water quality in the watershed provide benefits to the fish population.

The tribal staff described the amounts and quality of habitat available above and below the dam which emphasized the importance of the upper watershed as the bulk of the potential habitat is located above the dam. This discussion led to a description of plans to pass large woody debris at the dams to benefit the lower portion of the Green River. We discussed the relationship of other conservation and regulatory efforts in the region, focusing on the "usual and accustomed area" of the Muckleshoot Indian Tribe. We discussed the relationship between recovery and these efforts, as well as the relationship between recovery and impacts within the usual and accustomed area for the Tribe. The Services explained that each HCP cannot alone ensure recovery of the covered species; instead, we assess HCPs on the basis of whether recovery would be precluded if each "similarly situated land manager" were to implement similar conservation measures. Other items discussed were the effects of changing conditions outside the Planning Area and the existing degraded fish-habitat baseline that exists within this area and within other areas used by these salmon ESUs.

The tribal and Service staffs spent considerable time discussing large woody debris recruitment, its role in habitat formation, and the efficacy of various buffering prescriptions. It was recognized that some of the general language used in previous documents focused more on proportion of potential wood retained relative to fishbearing streams on the east side of the Cascade Crest. It was also noted that "old growth" wood pieces can be recruited from steep slopes, have significant diameter well above the ground, and that the volume of those pieces is far greater than in second growth stands. For instance, some information suggests that, at various distances from the stream, the number of large woody debris pieces recruited from second growth and old growth stands may be similar, but old growth stands contribute far greater volume of large wood. It was noted that site-potential tree heights of old growth trees are greater than 100-year site index heights derived from growth models. We also discussed the value of small wood in streams of various sizes. We all agreed that buffer widths affect both pieces and volume of wood recruited, and then focused our discussion on management that would occur within buffers.

We summarized our views of existing conditions and how those relate to riparian tree management, e.g., relative density and quadratic mean diameter, in the upper Green River. We discussed direction of fall and that high proportions of trees can fall toward the stream especially on steep slide slopes. A number of

potential stand-condition scenarios were explored and the amount of harvest possible under each scenario was discussed.

We discussed differences between buffers on non-fishbearing streams east and west of the Crest. The tribal staff were concerned that Green River chinook may not be getting the "full protection of potential habitat". Discussions of large wood recruitment continued with presentation on large wood and on landslides and channelized debris-flow zones. Run-out distances from channelized debris flows originating from landslides in mature forest give an idea of the potential transport abilities of these streams for large woody debris. This led to further discussions of the role small streams play in the recruitment of woody debris to downstream areas.

The discussions concluded with questions and answers concerning possibilities for future involvement of the Muckleshoot Indian Tribe in HCP implementation, including voluntary adjustments and discussions, minor amendments, adaptive management, watershed analysis, and determinations of extraordinary circumstances. The tribal staff are concerned about the implementation of watershed analysis according to the Washington State regulatory process. They expressed and emphasized their confidence in Plum Creek, but also expressed frustration with the watershed analysis process for developing prescriptions supported by the entire prescription team. Tribal staff asked Service staff what actions we would take in the event of a minority opinion regarding prescriptions. They also emphasized many of the short-comings with watershed analysis. Future actions and coordination were discussed and the Muckleshoot staff indicated their willingness to work with Plum Creek with regard to such items in the future.

INDEX

A

Adaptive Management	20, 22, 47, 55, 57, 69, 75, 77, 82, 88, 96, 98, 100, 101, 105, 106, 108, 112, 114, 115, 117, 118, 119, 120, 121, 122, 125, 126, 127, 135, 148
Adaptive Management Areas	82
Amphibians	85
Aquatic	8, 10, 11, 20, 22, 23, 24, 27, 28, 32, 33, 39, 40, 41, 43, 44, 47, 56, 57, 58, 77, 83, 102, 103, 133
Aquatic Conservation Strategy	8, 11, 20, 24, 32, 43, 44, 56, 57
Assumptions	4, 10, 88, 96, 105, 132, 133, 134, 135, 136, 137, 145

B

Bald Eagle	33, 83, 85, 100, 131
Bull Trout	14, 19, 28, 29, 36, 37, 41, 45, 83, 132, 142, 144

C

Connectivity	5, 7, 10, 29, 30, 70, 84, 122, 130
Critical Habitat	75, 109, 110, 112, 113, 114, 118, 120, 130, 131
Cumulative Effects	11, 13, 21, 29, 41, 101, 129, 130, 131, 135, 136

D

DCAs, <i>see Designated Conservation Areas</i>	
Deferrals	47, 48, 49, 93, 134, 135, 136, 137
Designated Conservation Areas	48
Dispersal Habitat	69, 86, 87

E

Ecosystem	10, 20, 101, 110, 111, 130, 131
Employment	124
Endangered Species Act	95, 100, 102, 104, 125, 131
Environmental Consequences	31, 127, 128, 135
ESA, <i>see Endangered Species Act</i>	

F

FD, <i>see Foraging and Dispersal Habitat</i>	27, 49, 50, 71, 87, 136
FIBRPLAN	48
Forest Practices Rules and Regulations	23, 34, 44, 113, 129
Forest Service	4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 19, 20, 22, 30, 32, 36, 40, 42, 43, 44, 55, 56, 60, 66, 67, 68, 71, 75, 78, 80, 81, 82, 83, 84, 88, 92, 95, 96, 98, 105, 122, 125, 126, 127, 128, 129, 130, 131, 132, 134, 136, 141, 144, 146

G

Goshawk	85, 121
Gray Wolf	14, 25, 85, 100, 101, 131
Grizzly Bear	9, 14, 25, 84, 85, 100, 101, 112, 128, 131

I

IA, <i>see Implementation Agreement</i>	
Impacts	7, 8, 11, 12, 13, 14, 15, 18, 19, 22, 23, 25, 27, 28, 29, 32, 33, 34, 35, 36, 41, 42, 45, 47, 58, 64, 65, 79, 83, 84, 85, 86, 87, 91, 93, 96, 100, 101, 102, 103, 104, 105, 106, 107, 109,

..... 110, 112, 114, 118, 119, 120, 131, 132, 134, 137, 142, 143, 145, 147
Implementation 8, 13, 15, 16, 18, 19, 22, 23, 24, 26, 29, 33, 36, 44, 56, 57, 65,
..... 83, 86, 88, 89, 90, 92, 95, 100, 101, 102, 106, 107, 109, 112, 114,
..... 115, 116, 117, 118, 120, 122, 125, 126, 131, 142, 146, 148
Implementation Agreement 22, 23, 24, 36, 65, 83, 88, 89, 90, 95, 100, 106, 107, 116, 117, 122, 125, 131
Incidental Take Permit 8, 14, 19, 24, 25, 42, 69, 83, 90, 95, 100, 102, 104, 106, 115, 118, 119, 125, 131, 144
ITP, *see Incidental Take Permit*

L

Land Exchange 4, 5, 8, 9, 11, 12, 13, 15, 16, 19, 20, 21, 22, 24, 25, 27, 30,
..... 32, 33, 37, 39, 44, 45, 46, 50, 51, 52, 55, 56, 58, 60, 66,
..... 68, 75, 77, 78, 79, 80, 83, 84, 85, 86, 92, 93, 95, 96, 98, 100, 105,
..... 116, 125, 126, 127, 130, 132, 134, 135, 136, 139, 142, 143, 144, 146
Landscape 5, 8, 20, 24, 26, 28, 37, 62, 70, 79, 81, 84, 85, 86, 87, 101, 109, 113, 121, 122, 124, 130, 145
Large Woody Debris 22, 24, 28, 29, 36, 40, 41, 42, 43, 46, 47, 56, 58, 60, 62, 104, 121, 145, 147, 148
Late-Successional Reserves 82, 88, 96, 98, 105
Lifeforms 91, 97, 113
LSR, *see Late-Successional Reserves*
LWD, *see Large Woody Debris*

M

Marbled Murrelet 14, 75, 85, 89, 92, 93, 96, 97, 98, 99, 100, 113, 122, 123, 124, 131
Matrix 10, 20, 21, 50, 53, 71, 75, 81, 82, 88, 91, 96, 98, 105, 113
Mitigation 8, 9, 13, 14, 21, 22, 68, 69, 79, 85, 87, 88, 89, 90, 94, 99, 101, 104,
..... 105, 106, 108, 109, 110, 111, 112, 113, 114, 115, 116,
..... 117, 118, 119, 120, 121, 122, 123, 130, 135, 146
Monitoring 27, 28, 33, 36, 39, 47, 57, 83, 86, 89, 109, 114, 115, 116, 117, 118, 119, 120, 121, 122, 141

N

National Marine Fisheries Service 20, 40, 56, 60, 86, 101, 102, 106, 126, 131, 145, 147
NEPA, *see National Environmental Policy Act*
Northern Spotted Owl 100, 108, 121, 131
Northwest Forest Plan 4, 5, 7, 10, 32, 53, 69, 71, 123, 126, 134
NRF, *see Nesting, Roosting, and Foraging Habitat*
NWFP, *see Northwest Forest Plan*

P

Peregrine Falcon 100, 131
Permit Period 10, 89, 104
Planning Area 4, 5, 6, 7, 8, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 23, 25, 26,
..... 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 44, 45, 46, 47, 48, 55, 56,
..... 57, 64, 66, 67, 69, 70, 71, 76, 78, 79, 80, 82, 84, 85, 86, 88,
..... 89, 91, 96, 99, 100, 101, 113, 116, 122, 123, 124, 126,
..... 127, 129, 130, 131, 132, 133, 134, 135, 142, 147
Public Comment 16, 23, 107

R

Recreation 6, 10, 81, 84, 95, 110, 127, 128
Research 75, 114, 119, 121
RHAs, *see Riparian Habitat Areas*
Riparian Habitat Areas 15, 20, 28, 38, 40, 47, 56, 58
Riparian Habitat Protection 47, 57
Riparian Leave Tree Areas 15
Riparian Reserves 9, 20, 37, 55, 57, 60, 61
Riparian Zone 133
RLTAs, *see Riparian Leave Tree Areas*
Road Access 130, 132, 134, 143

S

Salmon..... 11, 22, 31, 46
Scoping.....19
Snoqualmie Pass Adaptive Management Area22, 88, 96, 98, 105, 125, 126, 127
SPAMA, *see Snoqualmie Pass Adaptive Management Area*
Special Emphasis Species31
Species of Concern..... 33, 112, 113
Spotted Owl Habitat38, 50, 71, 86, 89, 93, 100, 136, 137
Surveys 14, 40, 42, 66, 89, 107, 108, 112, 125, 137

T

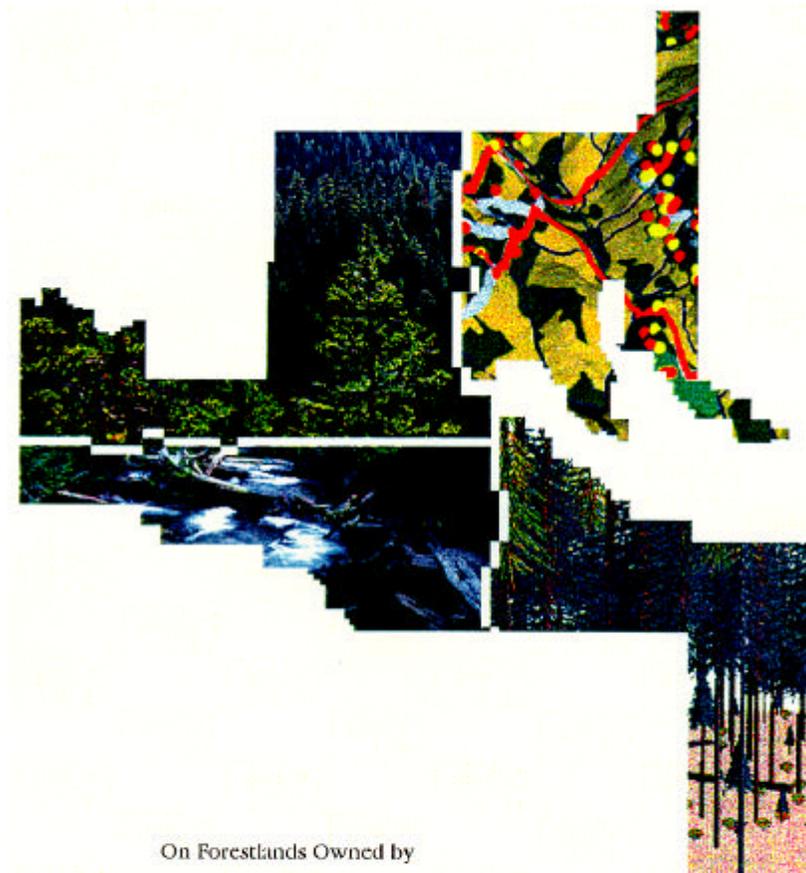
Talus Slopes..... 33, 83
TFW, *see Timber, Fish, and Wildlife*
Thinning..... 61, 63

W

Water Quality8, 18, 26, 27, 37, 41, 62, 75, 133, 147
Watershed Analysis..... 12, 14, 15, 17, 18, 21, 26, 27, 28, 33, 34, 35, 36, 37,
..... 39, 40, 41, 43, 44, 45, 46, 47, 57, 59, 61, 64, 65, 76, 77, 83, 89, 91,
.....103, 113, 115, 122, 123, 131, 132, 141, 145, 146, 148
Wetlands..... 110, 134, 143

APPENDIX B

FINAL
DESCRIPTION AND ANALYSIS
OF MODIFICATIONS TO
PLUM CREEK TIMBER COMPANY'S
CASCADE HABITAT CONSERVATION PLAN



On Forestlands Owned by
Plum Creek Timber Company, L.P
in the I-90 Corridor of the
Central Cascades Mountain Range,
Washington

May, 1999

TABLE OF CONTENTS

DESCRIPTION AND ANALYSIS.....	5
SECTION 1: BACKGROUND	5
1.1 INTRODUCTION	5
1.2 INTERSTATE-90 LAND EXCHANGE.....	7
1.3 OWNERSHIP CHANGES IN PLUM CREEK'S HCP PLANNING AREA.....	7
SECTION 2: MODIFICATIONS TO THE HCP RESULTING FROM THE LAND EXCHANGE.....	9
2.1 PRESENTATION OF MODIFICATIONS.....	9
2.2 MANAGEMENT OF LANDS ACQUIRED BY THE FOREST SERVICE.....	9
2.2.1 Designated Conservation Areas (Section 1.4; HCP).....	10
2.2.2 The Northwest Forest Plan (Section 1.5.1; HCP).....	10
2.2.3 New Forest Service Assumptions.....	11
2.3 MANAGEMENT OF LANDS ACQUIRED BY PLUM CREEK.....	12
2.3.1 Section 10(a) Species (Section 3.2; HCP).....	12
2.3.1.1 Spotted Owl (Section 3.2.1.1; HCP).....	12
2.3.1.2 Marbled Murrelet (Section 3.2.1.2; HCP).....	14
2.3.1.2.1 Murrelet Surveys (supplemental to Section 3.2.1.2, item (2); HCP)....	15
2.3.1.2.2 Post-Land Exchange Marbled Murrelet Surveys on Lands Acquired by Plum Creek.....	16
2.3.1.2.3 Nest Site Protection (Section 3.2.1.2; HCP).....	16
2.3.1.3 Grizzly Bear (Section 3.2.1.3; HCP).....	16
2.3.1.4 Gray Wolf (Section 3.2.1.4; HCP).....	17
2.3.2 Multi-Species Approach (Section 3.2; HCP).....	17
2.3.2.1 Lifeform 1 (fish) (Section 3.2.2.1; HCP).....	17
2.3.2.2 Lifeform 2 (frogs and salamanders) (Section 3.2.2.2; HCP).....	17
2.3.2.3 Lifeform 3 (turtles and ducks) (Section 3.2.2.3; HCP).....	18
2.3.2.4 Lifeform 4 (falcons and goats) (Section 3.2.2.4; HCP).....	18
2.3.2.5 Lifeform 5 (grouse, hares, deer, elk) (Section 3.2.2.5; HCP).....	18
2.3.2.6 Lifeform 6 (warblers, porcupines) (Section 3.2.2.6; HCP).....	18
2.3.2.7 Lifeform 7 (sparrow, blackbirds, thrushes) (Section 3.2.2.7; HCP).....	18
2.3.2.8 Lifeform 8 (warblers, flycatchers) (Section 3.2.2.8; HCP).....	18
2.3.2.9 Lifeform 9 (waxwings, grosbeaks) (Section 3.2.2.9; HCP).....	18
2.3.2.10 Lifeform 10 (squirrels, tanagers, warblers) (Section 3.2.2.10; HCP).....	18
2.3.2.11 Lifeform 11 (vireos, hawks, flycatchers) (Section 3.2.2.11; HCP).....	19
2.3.2.12 Lifeform 12 (herons, ospreys, great horned owls) (Section 3.2.2.12; HCP).....	19
2.3.2.13 Lifeform 13 and 13a (woodpeckers and nuthatches) (Section 3.2.2.13; HCP).....	19
2.3.2.14 Lifeform 14 and 14a (bats, owls, bluebirds) (Section 3.2.2.14; HCP).....	19
2.3.2.15 Lifeform 15 (shrews, bears, voles) (Section 3.2.2.15; HCP).....	19
2.3.2.16 Lifeform 16 (kingfishers, otters and beavers) (Section 3.2.2.16; HCP).....	19
2.3.3 Impacts of the HCP (Section 3.5; HCP).....	19
2.3.3.1 Northern Spotted Owl (Section 3.5.1.1; HCP).....	19
2.3.3.2 Larch Mountain Salamander (Section 3.5.2.2; HCP).....	20
2.3.3.3 Northern Goshawk (Section 3.5.2.4; HCP).....	21
2.4 OWNERSHIP CHANGES IN RIPARIAN AREAS.....	21
2.4.1 Riparian Management Strategy (Section 3.3; HCP).....	22
2.4.2 Aquatic Conservation Strategy (Section 1.5.2; HCP).....	23
2.4.3 Consistency Between Plum Creek and Federal Management Strategies.....	23
2.5 MITIGATION AND MEASURABLE CRITERIA (SECTION 3.6; HCP).....	24
2.5.1 Spotted Owl (Section 3.6.1; HCP).....	24
2.5.2 Marbled Murrelet (Section 3.6.5; HCP).....	24
2.5.3 Other Species (Section 3.6.5; HCP).....	24
2.5.4 Riparian Management (Section 3.6.7; HCP).....	25
2.6 MONITORING (SECTION 5.1; HCP).....	25
2.6.1 Spotted Owl Monitoring (Section 5.1.2; HCP).....	25
2.6.2 Marbled Murrelet Monitoring (Section 5.1.3; HCP).....	25
2.6.3 Aquatic Resources Monitoring (Section 5.1.6; HCP).....	26
2.7 COVERED LANDS.....	26

SECTION 3: REFERENCES	27
TABLES	29
FIGURES	37
APPENDIX 1: MODIFICATIONS TO PLUM CREEK TIMBER COMPANY'S CASCADES HABITAT CONSERVATION PLAN SINCE ISSUANCE OF THE INCIDENTAL TAKE PERMIT	67
1.1 SUMMARY	67
1.2 MINOR MODIFICATIONS FOR THE HABITAT CONSERVATION PLAN	68
1.2.1 Modifications to Plum Creek's HCP, Pursuant to Section 7.3.2 of the Implementation Agreement Governing the HCP. (See U.S. Fish and Wildlife Service Letter, Dated June 6, 1997)	68
1.2.1.1 Spotted Owl Seasonal Protection	68
1.2.1.2 Goshawk Seasonal Protection	68
1.2.1.3 Bald Eagle	68
1.2.1.4 Talus Slopes	68
1.2.2 Modification to Clarify the Inclusion of Lands with Harvest Rights from the City of Tacoma	69
1.2.3 Modification of the HCP to Reflect the Ownership Resulting from the I-90 Land Exchange	69
1.2.4 Changes in Timing of Monitoring and Watershed Analysis Schedule (HCP Sections 3 and 5)	69
1.2.4.1 Aquatic Resources Monitoring (HCP Section 5.1.6)	69
1.2.4.2 Changes to Watershed Analysis (HCP Sections 3.3.2, 3.3.5, and 3.6.7)	70
1.2.5 Modification to Change Reporting Timeframe for First Report to "No Later than December 31, 1999."	70
1.3 AMENDMENT OF THE INCIDENTAL TAKE PERMIT TO INCLUDE BULL TROUT AS A COVERED SPECIES ON LANDS ADMINISTERED BY PLUM CREEK UNDER ITS HCP	81
1.3.1 Summary	81
1.3.2 Background	81
APPENDIX 2: BASELINE ANALYSIS	85
2.1 BASELINE ANALYSIS	85
2.2 REPLACEMENT OF FIBRPLAN WITH OPTIONS FOREST ESTATE PLANNING MODEL	85
2.3 REPLACEMENT OF MANAGEMENT UNITS WITH FOREST INVENTORY POLYGONS	87
2.4 MODIFICATION TO TABLES IN THE HCP	88
APPENDIX 3: COVERED LANDS	93
INDEX	101

LIST OF TABLES

SUPPLEMENTAL TABLES:

Table A	Pre- and Post- 1-90 Land Exchange Ownership Acres in the HCP Planning Area.....	8
Table B	Width requirements (in feet) for Riparian Management Areas on National Forest System lands within the HCP Planning Area.....	22
Table C	Estimated percentages of Plum Creek (PC) ownership in the Planning Area providing spotted owl habitat and forest structural stages <i>as a result of changes documented in Appendix 2</i> . Percentages are estimated and displayed by decade for the 50 year Permit period.....	89
Table D	Estimated percentages on all ownership in the Planning Area providing spotted owl habitat and forest structural stages <i>as a result of changes documented in Appendix 2</i> . Percentages are estimated and displayed by decade for the 50 year Permit period.....	90

HCP TABLES:

Table 2A	Post-Land Exchange. Habitat type within major ownerships in Designated Conservation Areas (DCAs) within the Planning Area.....	29
Table 4A	Post-Land Exchange. Acres of land ownership in each of the designated areas and Matrix under the Northwest Forest Plan within the Planning Area.....	30
Table 22A	Post-Land Exchange. Prioritization of spotted owl sites.....	31
Table 24A	Post-Land Exchange. Estimated percentages of Plum Creek (PC) and all ownerships (HCP) in the Planning Area providing spotted owl habitat and forest structural stages <i>as a result of changes documented in Appendix 2</i> . Percentages are estimated and displayed by decade for the 50 year Permit period.....	32
Table 26A	Post-Land Exchange. Estimated percentages of all ownerships in the Planning Area providing primary (P) and total suitable habitat (SH) for each lifeform <i>as a result of changes documented in Appendix 2</i> . Percentages are estimates and displayed by decade for the 50 year Permit period.....	33
Table 26B	Pre-Land Exchange. Estimated percentages of all ownerships in the Planning Area providing primary (P) and total suitable habitat (SH) for each lifeform <i>as a result of changes documented in Appendix 2</i> . Percentages are estimates and displayed by decade for the 50 year Permit period.....	91
Table 27A	Post-Land Exchange. Miles of DNR stream types within each Northwest Forest Plan designated category and Matrix on Plum Creek's land in the Planning Area.....	34
Table 28A	Post-Land Exchange. Approximate miles and percentage of DNR stream types within each riparian protection strategy by ownership in the Planning Area.....	34
Table 30A	Post-Land Exchange. Estimated percentage of each structural stage for the entire Planning Area, Riparian Habitat Areas (RHAs), and rocks and talus slopes.....	35
Table 30bA	Post-Land Exchange. Projected structural stages of major forest classes in the Planning Area over time.....	36
Table 30B	Pre-Land Exchange. Estimated percentage of each structural stage for the entire Planning Area, Riparian Habitat Areas (RHAs), and rocks and talus slopes <i>as a result of changes documented in Appendix 2</i>	92

* "Supplemental Tables" are unique to this document.

"HCP Tables" are tables from the original HCP document. The numbering of these tables remains consistent with the HCP document. Table "XA" refers to Table X in the HCP document as revised to reflect changes that will result from the land exchange (these tables also incorporate changes to the baseline analysis and changes to ownership that are not related to the land exchange, as discussed in Appendix 2.) Table "XB" refers to Table X in the HCP document as revised to reflect changes in the baseline analysis and changes to ownership that are not related to the land exchange (as discussed in Appendix 2). These tables present pre-land exchange information.

LIST OF FIGURES

SUPPLEMENTAL FIGURES:

Figure A	Northern Spotted Owl Monitoring Demographic Study Areas	37
Figure B	Pre I-90 Land Exchange HCP Spotted Owl Demographic Monitoring Areas.....	39

HCP FIGURES:

Figure 6A	Proposed marbled murrelet critical habitat in the vicinity of Plum Creek's HCP Planning Area.....	41
Figure 9A	Designated Conservation Areas (DCAs) in proximity to Plum Creek's HCP Planning Area.....	43
Figure 10A	Northwest Forest Plan landscapes.....	45
Figure 34A	Lifeform 5 based on 0.5 mile radius moving window analysis.....	47
Figure 36A	Spotted owl habitat 1996.....	49
Figure 37A	Spotted owl habitat 2016.....	51
Figure 38A	Spotted owl habitat 2045.....	53
Figure 40A	Spotted owl pair nest site probability 1996.....	55
Figure 41A	Spotted owl pair nest site probability 2016.....	57
Figure 42A	Spotted owl pair nest site probability 2045.....	59
Figure 46A	Stand structural stages 1996.....	61
Figure 47A	Stand structural stages 2016.....	63
Figure 48A	Stand structural stages 2045.....	65

* "Supplemental Figures" are unique to this document.

"HCP Figures" are figures from the original HCP document. The numbering of these figures remains consistent with the HCP document. Figure "XA" refers to Figure X in the HCP document as revised to reflect changes that will result from the land exchange (these Figures also incorporate changes to the baseline analysis and changes to ownership that are not related to the land exchange, as discussed in Appendix 2.)

Summary
**of Modifications to
Plum Creek Timber Company's
Cascades Habitat Conservation Plan
(HCP)
as a Result of a
Land Exchange with the
U.S. Forest Service**

SUMMARY

1. The land exchange and associated donations will not require a change in the boundaries of the HCP Planning Area.

2. Ownership Changes In Plum Creek's HCP Planning Area

Acres Plum Creek will acquire from the Forest Service in the HCP Planning Area -10,200

Acres the Forest Service will acquire from Plum Creek in the HCP Planning Area -50,000

Acres Plum Creek ownership will increase (and Forest Service will decrease) in King County in the Planning Area -400

Acres Plum Creek ownership will increase (and Forest Service will decrease) in the Green River Subbasin in the Planning Area -1,400

Acres Plum Creek ownership will decrease (and Forest Service will increase) in Kittitas County in the Planning Area -39,800

Acres Plum Creek ownership will decrease (and Forest Service will increase) in the Yakima River Subbasin in the Planning Area -36,900

Plum Creek and Forest Service ownership within the Planning Area in the Green and Yakima River Subbasins will be similar to their ownerships in King and Kittitas Counties, respectively.

3. Management of lands acquired by the Forest Service in the HCP Planning Area

Designated Conservation Areas —

Increase in acres of nesting, roosting, and foraging (NRF) habitat in the Planning Area under Forest Service ownership after the land exchange -9,200

Increase in acres of foraging and dispersal (FD) habitat in the Planning Area under Forest Service ownership after the land exchange - 9,600

Northwest Forest Plan —

Late-Successional Reserves:

Increase in Forest Service acres in the Planning Area -8,300

Adaptive Management Areas:

Increase in Forest Service acres in the Planning Area -31,500

Matrix:

Decrease in Forest Service acres in the Planning Area -500

Riparian Reserves:

Increase in Forest Service acres in the Planning Area -12,000

4. Management of lands acquired by Plum Creek from the Forest Service in the HCP Planning Area (Section 3.2, HCP) - Below is a list of clarification and changes contained in this document.

Spotted Owl

- Item (2) - Percentage of NRF habitat
- Item (3) - Prioritization of owl nest sites
- Item (4) - Harvest deferrals
- Item (5) - FD corridors
- Item (6) - NRF and dispersal habitat between and within DCAs
- Item (7) - NRF and FD habitat in Riparian Habitat Areas
- Item (8) - Clarification of demographic and verification surveys
- Item (11) - Clarification of active nest site protection

Rationale for Designating NRF Deferrals and FD Corridors —

Clarification and changes in NRF habitat and FD corridors

Marbled Murrelet

- Incorporation of new murrelet surveys
- Clarification of surveys on lands acquired from the Forest Service in the HCP Planning Area

Multi-Species Approach

Changes in primary and suitable habitat for Lifeforms 1 through 16, 1996 and 2045

5. Impacts of the HCP — Below is a list of clarification and changes contained in this document.

Spotted Owl

- Item (1) - Trends in amount and type of owl habitat
- Item (3) - Carrying capacity for spotted owls
- Item (4) - Dispersal habitat

Larch Mountain Salamander

Northern Goshawk

6. Ownership changes in Riparian Areas in the HCP Planning Area

7. Mitigation and Measurable Criteria (Section 3.6; HCP) — Below is a list of clarification and changes contained in this document.

Spotted Owl

- Item (2) - NRF Maintenance
- Item (3) - NRF Deferrals
- Item (4) - FD Corridors
- Item (5) - Riparian Habitat Areas
- Item (9) - Seasonal Protection



Marbled Murrelet

Item (10) Murrelet Surveys

Item (11) Murrelet Habitat Harvest Deferrals

Other Species

Item (17) - Goshawk Nest Protection

Riparian Management

Item (25) - Watershed Analysis

Item (26) - Riparian Habitat Areas

Item (27) - 303(d) Harvest Deferrals

8. Monitoring (Section 5.1; HCP) — Clarification and changes

Spotted Owl

Marbled Murrelet

Aquatic Resources

9. Covered Lands — Clarification and changes

The legal description of all lands that will be covered by Plum Creek's HCP following the land exchange. Includes timber lands and timber harvest rights owned by Plum Creek.

APPENDIX 1 — Modifications to Plum Creek’s HCP since issuance of the Incidental Take Permit in June 1996

- A. Minor Modifications for the Habitat Conservation Plan
- B. Amendment to the Incidental Take Permit for Bull Trout

APPENDIX 2 — Baseline Analysis

- A. Replacement of FIBRPLAN with OPTIONS Forest Estate Planning Model
- B. Replacement of Management Units with Forest Inventory Polygons
- C. Modification of Tables in HCP

APPENDIX 3 — Covered Lands

Description and Analysis
of Modifications to
Plum Creek Timber Company's
Cascades Habitat Conservation Plan
(HCP)
as a Result of a
Land Exchange with the
U.S. Forest Service

DESCRIPTION AND ANALYSIS

SECTION 1: BACKGROUND

1.1 INTRODUCTION

In October, 1998, a land exchange between Plum Creek Timber Company (Plum Creek) and the U. S. Forest Service (Forest Service) was approved by the U. S. Congress. The legislated land exchange included 62,384 acres of Plum Creek lands and 16,495 acres of National Forest System lands. 10,894 acres of the National Forest System lands and all of the Plum Creek lands are within the Planning Area of Plum Creek's Cascades Habitat Conservation Plan (HCP). An additional 844 acres of Plum Creek land are being donated to the Forest Service. Most of Plum Creek's lands to be transferred to the Forest Service are located within the boundaries of the Wenatchee National Forest (53,576 acres) with the balance of the lands in the Mt. Baker-Snoqualmie National Forest (8,808 acres). National Forest System lands to be traded to Plum Creek are distributed within the Wenatchee (5,197 acres), Mt. Baker-Snoqualmie (5,697 acres), and Gifford Pinchot National Forests (5,601 acres). The values of the land exchanged will be equal in value. This will not include donated lands. If the value of the lands listed in the legislation is not equal as determined by an appraisal, the parcels of land to be deleted are listed in the legislation by order of priority. A draft environmental impact statement (DEIS) for the land exchange was issued for public comment by the Forest Service in 1998 (USDA 1998). A final environmental impact statement (FEIS) will be issued in 1999.

A preliminary final appraisal has been released which is incorporated into the ownership assumptions for this document. The appraisal indicates the land exchange will be comprised of 49,158 acres of Plum Creek land and 15,832 acres of National Forest System lands. The Plum creek 49,158 acres and the donated 844 acres are in the HCP Planning Area for a total of approximately 50,000 acres transferred to the Forest Service. The acres from the Forest Service to Plum Creek were reduced to 15,832 after adjusting for some cultural resource issues. After deducting the 5,601 acres in the Gifford-Pinchot National Forest, approximately 10,200 acres in the HCP Planning Area will be transferred to Plum Creek. A final document will be issued upon completion of the land exchange which will reflect the final acres exchanged and/or donated. Throughout this document, the phrase "land exchange" is used to refer to both exchanged and donated lands.

As a condition for completing the land exchange, Plum Creek notified the U. S. Fish and Wildlife Service and National Marine Fisheries Service (collectively, "Services") that it proposes to modify its existing HCP to provide incidental take authorization for activities on the approximately 10,200 acres of land within the Planning Area that will be acquired by Plum Creek from the Forest Service. The approximately 5,600 acres of land acquired by Plum Creek outside of the HCP Planning Area will not be covered by Plum Creek's Cascades HCP. The approximately 50,000 acres transferred to the Forest Service will no longer be covered by the incidental take permit. Plum Creek does not propose, and the land exchange does not require a change in the boundaries of the HCP Planning Area. Furthermore, Plum Creek does not propose to increase the level of incidental take analyzed and authorized under the existing Incidental Take Permit.

This document supports Plum Creek's request for modification by describing and analyzing changes in Plum Creek's HCP that will occur as a result of the land exchange with the Forest Service. It discusses changes that will occur as a result of the land exchange with the Forest Service that either affect or

potentially affect implementation of the HCP on Section 10(a) species and/or unlisted agreement species covered in the HCP. A draft document accompanied the draft supplemental environmental impact statement (DSEIS) which was issued for public comment by the Services. This document reflects the best estimate of final land parcels in the land exchange and will be accompanied by the Services' final supplemental environmental impact statement (FSEIS). If approved, this document will supplement and modify the approved June 1996 HCP. A completely revised HCP document will be issued incorporating these changes and any final land exchange adjustments which may be forthcoming as the appraisal is finalized.

In amending Section 10 of the Endangered Species Act, Congress recognized that "circumstances and information may change over time and that the original plan might need to be revised" (H.R. Rep. No. 97-835, 97th Cong., 2nd session). As required in the Section regulations implementing 10(a) regulations, 50 C.F.R. §17.22(b), 17.32(b), and 222.22, the original 1996 HCP provided details of the procedures that Plum Creek would use to deal with changing circumstances, including land exchanges with the United States. Procedures and standards for modifying the HCP to accommodate a land exchange between Plum Creek and the Forest Service were contemplated by the 1996 HCP (Section 5.3.4) and Implementation Agreement (IA, Section 7.3). However, the exact size and timing of the land exchange could not have been reasonably forecasted prior to issuance of the Incidental Take Permit. Therefore, specific land exchange configurations were not included in the HCP. Instead, the terms of the HCP, together with the HCP's Implementation Agreement, provide two scenarios whereby "the biological integrity of the HCP would be either maintained or improved" by a land exchange (see Section 5.3.4.2; HCP). The I-90 Land Exchange is a combination of these two scenarios. Under the HCP, "Scenario One" is an exchange of Plum Creek lands in the Planning Area for Federal lands outside the Planning Area. "Scenario Two" is an exchange of intermingled Federal and Plum Creek lands within the Planning Area that results in: (1) increased Federal ownership in LSR and AMA lands; (2) reduced Federal ownership in matrix lands; and (3) reduced harvestable area in the Planning Area. The I-90 Land Exchange satisfies all three of these conditions.

As specified in the HCP and IA, any adjustments or modifications with respect to lands "covered" by the HCP in the HCP Planning Area that will occur as a result of the land exchange with the Forest Service will not include requirements for additional land, water, or financial compensation, or additional restrictions on the use of land, water, or other natural resources otherwise available for timber harvest, development, or use under the HCP and IA. The land exchange will not result in additional expenditures to Plum Creek that are above what is already required under Plum Creek's properly implemented HCP and IA. Further, Plum Creek will continue to be provided regulatory assurances pursuant to its properly implemented HCP for all species that are "adequately covered" in the HCP.

A DEIS for the land exchange between Plum Creek and the Forest Service was completed for the lands in the Planning Area (USDA 1998). The land exchange FEIS will be released in May, 1999. As a direct result of the land exchange, National Forest System lands will be consolidated in the central Cascades region and managed in accordance with the Northwest Forest Plan (NWFP). Lands acquired by Plum Creek within its HCP Planning Area will be managed in accordance with Plum Creek's properly implemented HCP, as supplemented herein.

Under the NWFP and its Aquatic Conservation Strategy (ACS), the lands to be acquired by the Forest Service within Plum Creek's HCP Planning Area will be managed for late-successional, old growth, or Matrix forest characteristics. A large portion of the lands acquired by the Forest Service will be managed in accordance with the Snoqualmie Pass Adaptive Management Area Plan (SPAMA). Under SPAMA, the lands will be managed to provide a distribution of forest age and structural classes and stream

environments that provide habitat for late-successional and old growth related native plants and wildlife species on National Forest System lands.

The NWFP, ACS, and SPAMA strategies as implemented on National Forest System lands will be supplemented by implementation of Plum Creek's HCP for the new lands that Plum Creek acquires within the HCP Planning Area. Management of the newly acquired lands in accordance with Plum Creek's HCP will not detract from the management goals and objectives on Federal lands within and adjacent to the Planning Area. Plum Creek's HCP management strategy "tiers" off the measures outlined in the NWFP and ACS by developing standards and guidelines that are different but complementary to the standards and guidelines in the NWFP. This strategy increases the potential success of the NWFP, is consistent with the objectives of SPAMA, and minimizes cumulative effects by ensuring that the HCP is compatible with adjacent National Forest System lands.

1.2 INTERSTATE-90 LAND EXCHANGE

The United States Congress legislated the Interstate-90 (I-90) Land Exchange involving land owned by the Forest Service and Plum Creek. The Forest Service and Plum Creek will exchange approximately 65,800 acres of land, in aggregate, of which approximately 60,200 are within the I-90/Snoqualmie Pass corridor of the central Cascades Mountain Range in Washington State. The purpose of the land exchange is to consolidate land ownership between the Forest Service and Plum Creek. It is driven by three major needs or objectives:

1. To increase and maintain unfragmented late-successional habitat and critical north/south wildlife connectivity corridors across National Forest System lands in the I-90/Snoqualmie Pass Adaptive Management Area (SPAMA);
2. To improve efficiencies and economics of access to and management of lands and resources on both National Forest System lands and Plum Creek ownerships. This includes reduction in the need for, and associated impacts of, access road development and maintenance across areas of checkerboard ownership; and
3. To take advantage of the opportunity for the Forest Service to acquire areas with both high scenic values and lands with high demand for dispersed unroaded recreation use, within the Alpine Lakes Management Unit on the Cle Elum Ranger District.

1.3 OWNERSHIP CHANGES IN PLUM CREEK'S HCP PLANNING AREA

Plum Creek's HCP Planning Area is comprised of lands on both the east and west sides of the Cascades Mountains crest along the I-90 corridor in central Washington, between 60 to 100 miles east of Seattle (Figure 1, Page 1-1 of the FSEIS); All tables and figures in this document are located at the end of Section 2, except for supplemental tables. Supplemental tables are located on the same page in which they are referenced, or on the page immediately following the reference). The Planning Area boundary encompasses 418,700 acres of intermingled Plum Creek, Forest Service, and other (state and private) ownership. Section 1.2 of the HCP provides a detailed description of the Planning Area, the selection criteria that were used to establish the Planning Area boundary, and Plum Creek's lands that are covered by the HCP (see Appendix 1; HCP).

While the land exchange and donations will not alter the geographical boundaries of the Planning Area, it will create a new ownership mosaic. Within the Planning Area, Plum Creek will acquire approximately

10,200 acres from the Forest Service and exchange 50,000 acres to the Forest Service (see Table A). The exchange will eliminate much of the checkerboard ownership pattern in the HCP Planning Area.

Lands in the HCP Planning Area include portions of King and Kittitas Counties. Within the Planning Area, Plum Creek ownership will increase slightly from 50,700 to 52,100 acres in King County and will decrease from 118,600 to 79,000 acres in Kittitas County. Forest Service ownership will decrease from 36,800 acres to 36,500 acres in King County and increase from 159,400 acres to 199,100 acres in Kittitas County.

In the Green River Subbasin, Plum Creek ownership will increase 1,400 acres—from 50,700 to 52,100—and the Forest Service will decrease from 34,400 to 33,000. In the Yakima River Subbasin, Plum Creek ownership will decrease 36,700 acres—from 99,100 to 62,400—and the Forest Service ownership will increase from 139,100 to 175,900.

*Table A. Pre- and Post I-90 Land Exchange Ownership Acres in the HCP Planning Area**

Ownership	Original HCP	Pre-Land Exchange	Post-Land Exchange
Plum Creek	169,200	170,600	131,200
Forest Service	201,800	196,200	235,600
Other (State and Private)	41,100	45,300	45,300
Water (Lakes)	<u>6,600</u>	<u>6,600</u>	<u>6,600</u>
TOTAL	418,700	418,700	418,700

* Rounded to the nearest 100 acres.

Other changes within the Planning Area occurred between the approval of the HCP in June, 1996, and the I-90 Land Exchange.

The City of Tacoma owns forested lands within Plum Creek’s HCP Planning Area. In 1988, Plum Creek sold 1,400 acres to the City of Tacoma but retained timber harvest rights through 2008. Although Plum Creek does not own these lands, all 1,400 acres are treated by Plum Creek as “owned lands” and are managed under the standards and guidelines outlined in the HCP and ITP.

In 1997, Plum Creek concluded the Silver Creek land sale of approximately 960 acres to the Forest Service which increased total acreage of Federal lands in the HCP Planning Area. Since the sale was imminent when the HCP was approved, these lands were treated as Forest Service lands in the original HCP and in all associated documents and analyses.

In 1998, the Weyerhaeuser company and the Forest Service completed a land exchange known as the Huckleberry Land Exchange. The land exchange involved approximately 34,500 acres with a net of approximately 4,200 acres in the HCP Planning Area transferred from the Forest Service to Weyerhaeuser. Therefore, Federal ownership in the HCP Planning Area decreased as a result of the land exchange.

Subsequent to the approval of the HCP, additional work on GIS was done to refine the ownership boundaries resulting in 1,400 acres moving from Federal ownership to Other ownership.



SECTION 2: MODIFICATIONS TO THE HCP RESULTING FROM THE LAND EXCHANGE

2.1 PRESENTATION OF MODIFICATIONS

This document is intended to become an addendum to Plum Creek's original Cascades HCP document that was issued in June 1996. This document identifies modifications that have been made to the HCP since Plum Creek was issued an Incidental Take Permit in June 1996 and modifications that will result from the I-90 Land Exchange. The discussion of modifications in this document refers back to specific and relevant sections of the HCP. References to the HCP sections are located in parentheses immediately following section headings.

On occasion, text from the original HCP document is used to illustrate modifications. In these instances, text taken from the HCP is italicized and the section of the HCP from which the text was taken is noted. Changes to the text are noted by striking out (putting a line through) the HCP (italicized) text that is being modified. Replacement text or supplemental text appears in normal font and is enclosed in brackets []. For example, a change in spotted owl NRF habitat on Plum Creek ownership within the HCP Planning Area resulting from the land exchange would be presented as follows:

(text taken from Section 3.2.1.1 of the HCP):

Provide spotted owl NRF habitat throughout the Permit period. Plum Creek will maintain those amounts of NRF habitat identified for each decade in ~~Table 24~~ [Table 24A (Page 32)] (at a minimum, & [6] percent of its ownership in the Planning Area) as spotted owl NRF habitat.

Many of the tables and figures included in the original HCP document will change as a result of the land exchange. Of those tables and figures, only those that are referred to in the text of this document are included in this document. To facilitate the use of this document as an addendum to the original HCP, the numbering of these tables and figures remains consistent with the original HCP document. For example, "Figure 23A" refers to "Figure 23" in the HCP document as revised to reflect changes that will result from the land exchange (these figures and tables also incorporate changes to the baseline analysis and changes to ownership that are not related to the land exchange, as discussed in Appendix 2). "Figure 23B" refers to "Figure 23" in the HCP document as revised to reflect changes in the baseline analysis and changes to ownership that are not related to the land exchange (as discussed in Appendix 2). These tables and figures present pre-land exchange information. "Supplemental" tables and figures are unique to this document and have been assigned a letter name, such as "Table A."

2.2 MANAGEMENT OF LANDS ACQUIRED BY THE FOREST SERVICE

Federal lands in the HCP Planning Area occur within the boundaries of the Wenatchee and Mt. Baker-Snoqualmie National Forests. They are managed according to the Forest Land and Resource Management Plans in each forest and Federal laws and regulations governing the management of federally owned forest lands. Each Forest Plan contains land allocations (i.e., Management Areas) for each land parcel, specific to the individual Forest Plans, and each Plan defines standards and guidelines for each type of Management Area.

The Record Of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl (USDA Forest Service and USDI Bureau of Land Management 1994), otherwise known as the Northwest Forest Plan (NWFP), amended the Forest Plans for the Wenatchee and Mt. Baker-Snoqualmie National Forests in 1994 with additional land allocations and standards and guidelines.

2.2.1 DESIGNATED CONSERVATION AREAS (SECTION 1.4; HCP)

Selected lands within the HCP Planning Area fall within the boundaries of Designated Conservation Areas (DCAs). These areas were established in the final draft Recovery Plan for the Northern Spotted Owl to provide Federal forest lands as primary habitat for the spotted owl. Portions of four DCAs are located within the Planning Area, two in the Western Cascades Province (WD-7 and WD-8) and two in the Eastern Cascades Province (WD-39 and WD-40) (Figure 9A, Page 45).

The distribution of nesting, roosting, and foraging (NRF) and foraging and dispersal (FD) habitat within each of these DCAs by ownership will change as the result of the land exchange. Table 2A (Page 29) shows the acreages of NRF and FD habitat within the four DCAs in the Planning Area under Plum Creek and Forest Service ownership following the land exchange.

2.2.2 THE NORTHWEST FOREST PLAN (SECTION 1.5.1; HCP)

The NWFP applies to 24,455,300 acres of Federal lands within the range of the northern spotted owl, including all Federal lands in the HCP Planning Area. Under the NWFP, the Forest Service is mandated to take an ecosystem approach to forest management, with support from scientific evidence; meet the requirements of existing laws and regulations; maintain a healthy forest ecosystem with habitat that will support populations of native species (particularly those species associated with late-successional and old growth forests), including protection for riparian areas and waters; and maintain a sustainable supply of timber and other forest products that will help maintain the stability of local and regional economies on a predictable and long-term basis.

All Federal lands governed by the NWFP are allocated into one of six designated categories, or a non-designated category referred to as Matrix. The designated categories include Adaptive Management Areas (AMA), Administratively Withdrawn Areas (AWA), Managed Late-Successional Areas, Congressionally Withdrawn Areas, Late-Successional Reserves (LSR), and Riparian Reserves. These areas have specific management direction regarding how the lands are to be managed, including actions that are prohibited and descriptions of the conditions that should occur in each area. The land allocations created by the NWFP deal primarily with the management of late-successional and old growth terrestrial and aquatic habitats. The NWFP standards and guidelines supersede those of the individual Forest Plans, unless the standards and guidelines of the individual Forest Plan are more restrictive or provide greater benefits to late-successional forest related species.

The composition of Federally designated lands in the HCP Planning Area will be altered by the land exchange. Forest Service lands acquired by Plum Creek will no longer be managed by the NWFP or individual Forest Plan standards and guidelines. Instead, these lands will be managed by Plum Creek in accordance with Plum Creek's HCP and other state and Federal laws and regulations. Likewise, lands acquired by the Forest Service will not be subject to management under Plum Creek's HCP, but will be allocated into one of the six NWFP designated categories and managed in accordance with the standards and guidelines associated with each category. Table 4A (Page 30) and Figure 10A (Page 47) show the



distribution of land in the NWFP designated areas and Matrix within the HCP Planning Area following the land exchange.

2.2.3 NEW FOREST SERVICE ASSUMPTIONS

Forest Service management of lands in the Planning Area are mandated by their respective Forest Management Plans as amended by the Northwest Forest Plan and the Snoqualmie Pass Adaptive Management Area Plan. The applicable sections of both plans are as follows:

Record of Decision for the Northwest Forest Plan, USFS, April 13, 1994, page 8:

Late Successional Reserves: Late-successional reserves are to be managed to protect and enhance old-growth forest conditions. For each late-successional reserve (or group of small reserves) managers should prepare an assessment of existing conditions and appropriate activities. No programmed timber harvest is allowed inside the reserves. However, thinning or other silvicultural treatments inside these reserves may occur in stands up to 80 years of age if the treatments are beneficial to the creation and maintenance of late-successional forest conditions. In the reserves east of the Cascades and in Oregon and California Klamath Provinces, additional management activities are allowed to reduce risks of large-scale disturbance. Salvage guidelines are intended to prevent negative effects on late-successional habitat. Non-silvicultural activities within late-successional reserves are allowed where such activities are neutral or beneficial to the creation and maintenance of late-successional habitat.

Record of Decision for Snoqualmie Pass Adaptive Management Area Plan, USFS, November 21, 1997, page 6:

Silvicultural Treatments and Forest Commodities - At this time, the standards and guidelines of the Late-Successional Reserves (NWFP) apply to silvicultural treatments within the AMA. There will be no programmed harvest within the AMA; however, thinning and other silvicultural activities may occur, provided that the treatments are beneficial to the creation and maintenance of the late-successional forests. On the Western slopes of the Cascades Crest, the maximum stand age within which treatments can occur is 80 years of age. East of the Cascades Crest, there is no age limitation, but treatments will focus on younger stands. The types and locations of treatments to be carried out will be determined as a part of subsequent site-specific NEPA analysis. Since this area is allocated as an AMA, the results of monitoring and research will be used to adapt and change these standards and guidelines over time, while maintaining the focus on late-successional habitat and connectivity objectives.

The above guidelines preclude harvest in LSR and AMAs, to reduce impacts to late-successional habitat, but the guidelines allow silvicultural treatment to enhance habitat. Discussions with staff from both National Forests indicate that harvest in Matrix areas is likely to be low, but any harvest that does occur would emphasize habitat enhancement. Models for projections over time could not replicate habitat enhancement. Therefore, the growth and yield model runs conducted by Plum Creek for Forest Service lands assumed no harvest in LSR, AMA, and Matrix areas during the HCP Permit period. This approach understated the habitat, which would result from habitat enhancement activities.

2.3 MANAGEMENT OF LANDS ACQUIRED BY PLUM CREEK

Plum Creek manages its lands in the HCP Planning Area for the primary purpose of growing and harvesting commercial timber. It does so in accordance with Plum Creek's properly implemented HCP (Section 3; HCP) as supplemented herein, Standard Management Practices (Section 1.2.3; HCP), Environmental Principles (Appendix 2; HCP), the Washington Forest Practices Rules and Regulations, and all other local, state, and Federal laws and regulations governing the management of forest lands.

2.3.1 SECTION 10(A) SPECIES (SECTION 3.2; HCP)

The primary goal of Plum Creek's HCP is to provide Plum Creek with predictability and flexibility to manage its timberlands economically while contributing in a meaningful way to the conservation of the spotted owl, marbled murrelet, grizzly bear, gray wolf, and other species both listed and unlisted, named and unnamed in the Planning Area. Although Plum Creek's Incidental Take Permit was issued for the listed species mentioned above only, the HCP and IA anticipated that species occupying the Planning Area might become listed after issuance of the Incidental Take Permit. By adequately addressing all species of concern with the Planning Area, including those that were unlisted but likely to become listed during the Permit period (see Section 1.2.5; HCP), Plum Creek and the Services simplified the process for Plum Creek to obtain a permit amendment to include newly listed species under the Incidental Take Permit. The most recent addition to the Incidental Take Permit was the bull trout (*Salvelinus confluentis*). Plum Creek considered the conservation needs of the bull trout in the development in its HCP and ensured implementation of the conservation program for the species under the IA. Plum Creek has obtained a permit amendment from the Services to add the bull trout to the Section 10(a) species in the HCP (see letter dated July 14, 1998; Appendix 1). Plum Creek has also requested amendments to the Incidental Take Permit to cover Middle Columbia River steelhead trout (*Oncorhynchus mykiss*), Canada lynx (*Lynx canadensis*), Puget Sound/Coastal Distinct Population Segment for bull trout (*Salvelinus confluentus*), and Puget Sound Evolutionarily Significant Unit of chinook salmon (*Oncorhynchus tshawytscha*).

2.3.1.1 SPOTTED OWL (SECTION 3.2.1.1; HCP)

To address the biological requirements of northern spotted owls in the Planning Area, the following modifications will be made to the spotted owl management plan (text taken from Section 3.2.1.1 of the HCP):

- (2) *Provide spotted owl NRF habitat throughout the Permit period. Plum Creek will maintain those amounts of NRF habitat identified for each decade in ~~Table 24~~ [Table 24A (Page 32)] (at a minimum, & [6] percent of its ownership in the Planning Area) as spotted owl NRF habitat.*
- (3) *Prioritize owl nest sites to protect NRF habitat and develop dispersal habitat corridors for the most productive and strategically located (i.e., high density "cluster areas") owl nest sites on . [Prioritization of owl nest sites following the land exchange with the Forest Service is shown in Table 22A (Page 31).]*
- (4) *Defer harvest activities on approximately ~~2,600~~ [300] acres (~~57 designated management units~~) of NRF habitat. ~~These management units are currently NRF habitat and they range between 7 and 105 acres in size. These units~~ [acres] also provide dispersal habitat within the Planning Area.*
- (5) *Use only selective [or partial] harvest on approximately ~~3,200~~ [1,100] acres (~~64 management units~~) to create and retain FD corridors. These corridors are currently NRF and/or FD habitat and they range between 9 and 102 acres in size.*



- (6) Provide NRF and dispersal habitat between and within the Designated Conservation Areas (i.e., WD-7, WD-8; WD-39, WD-40; ~~Figure 9~~ [Figure 9A (Page 45)]) in the Planning Area in support of the biological goals for non-Federal lands (Section 1.4) outlined in the final draft recovery plan (Lujan et al. 1992) for the spotted owl in the I-90 corridor. This will enable spotted owls to disperse successfully across Plum Creek's ownership to occupy habitat on interspersed Federal lands.
- (7) Protect and maintain ~~10,900~~ [6,200] acres in riparian habitat areas (Section 3.3) to provide NRF and FD habitat between upland deferrals on Plum Creek's lands and habitat on Federal lands. This includes ~~5,600~~ [2,700] acres in riparian habitat areas that currently function as NRF or FD. Upland NRF deferrals or FD corridors were purposely located adjacent to riparian habitat areas to augment habitat conservation for the spotted owl, to serve as refuge for species that disperse only short distances, and to provide greater connectivity of late-successional forests for owl movement, especially where telemetry studies suggested current use by owls.
- (8) Demographic and verification surveys [in the Planning Area] will be conducted to evaluate the effectiveness of Plum Creek's harvest deferrals and dispersal corridors in maintaining the viability of spotted owl nest sites identified in the prioritization process for deferrals, and to verify the assumptions of the RSPF model (Section 2.9; HCP, and Irwin and Hicks 1995).
- (11) Known owl sites [with active spotted owl nests] in the Planning Area will receive protection within a 0.25-mile radius from March 1 through August 31. [(see U. S. Fish and Wildlife Service letter dated June 6, 1997; Appendix 1).]

Rationale for Designating NRF Deferrals and FD Corridors

To address this short-term reduction in owl habitat at a reasonable economic cost to Plum Creek, a network of ~~121~~ [40] NRF harvest deferrals and FD corridors were designated in the Planning Area. The specific objectives of the NRF deferrals and FD corridors are to:

- (1) support productive pair sites in the Planning Area;
- (2) link Federal NRF and FD habitat in spotted owl high density "cluster" areas (~~Figure 16~~);
- (3) augment and connect riparian habitat areas where NRF and FD habitat currently exist; and
- (4) provide dispersal opportunities for spotted owls between high density "clus

~~Fifty seven~~ [10] ~~management units~~ [forest inventory polygons] totaling ~~more than 2,600~~ [300] acres were designated as NRF deferrals. The ~~management units~~ [forest inventory polygons] designated for NRF deferral ~~range from 7 acres to 105 acres, and~~ will remain unharvested for at least 20 years. All ~~57~~ [10] ~~units~~ [polygons] are currently NRF habitat. ~~Sixty four~~ [Thirty] ~~management units~~ [forest inventory polygons] totaling ~~3,200~~ [1,100] acres were designated as FD corridors. In these ~~units~~ [polygons], selective [or partial] harvest prescriptions will be employed to harvest some merchantable timber while retaining FD habitat. A description of spotted owl habitat types is provided in Section 2.4. The FD corridor ~~units~~ [polygons] ~~range from 9 acres to 102 acres, and~~ will remain as FD habitat throughout the Permit period. All ~~64~~ [30] FD corridor ~~management units~~ [forest inventory polygons] are currently NRF or FD habitat.

To maximize the biological value of the NRF deferrals and FD corridors, Plum Creek prioritized the ~~407~~ [106] spotted owl sites in the Planning Area (Herter et al. 1995) and identified ~~30~~ [11] sites where deferrals and corridors would be ~~essential~~ [beneficial] to maintaining spotted owl productivity through the first 20 years of the Permit period. Of the ~~407~~ [106] known spotted owl site centers, only ~~67~~ [40] within the Planning Area contain 100 acres or more of habitat on Plum Creek's ownership within a 1.8-mile radius and have been recently occupied, based on demographic surveys (~~Table 22~~ [Table 22A (Page 31)]). Among these, ~~17~~ [14] are considered unlikely to be affected by Plum Creek's forest-management activities because either, (1) habitat on Plum Creek's land was present only at the outer edges of the 1.8-mile management circle and this habitat was often isolated from the site center by prominent ridges that lack habitat or by lakes, or (2) the site centers were located on Forest Service ownership which contained sufficient habitat, based on the RSPF model (Section 2.9; Irwin and Hicks 1995).

Of the ~~50~~ [26] remaining sites, ~~30~~ [11] sites, where habitat on Plum Creek's land is ~~essential~~ [beneficial] to maintaining occupancy and productivity, were selected for NRF deferral and FD corridor designation. These sites are [generally] located in high-density cluster areas and in either Adaptive Management Areas or Late-Successional Reserves where the deferrals and corridors will augment and link habitat retained on Federal lands. [Some of these sites are located in Federally designated Matrix and were selected for NRF deferrals and FD corridors based on their long-term reproductive histories and geographic locations.] ~~Twenty-eight~~ [10] of the ~~30~~ [11] sites selected for NRF deferrals and FD corridors were occupied in ~~1994~~ [the last five years].

Specific criteria used to select the ~~management units~~ [forest inventory polygons] for NRF deferrals and FD corridors include the following:

- (1) proximity to known nest sites;
- (2) areas of known spotted owl use based on radio-telemetry;
- (3) habitat quality;
- (4) proximity to Federal habitat and riparian areas; and
- (5) likelihood of the deferrals and corridors being used by multiple spotted owl pairs.

Figure 33 illustrates the rationale used to designate NRF deferrals and FD corridors in the Planning Area. The remaining ~~20~~ [15] sites were not considered for NRF deferrals because they lacked consistent occupancy or productivity (i.e., ~~13 of the 20 sites were vacant in 1994~~ [only 4 of the sites had nests in the last 5 years]). Additionally, many of these sites were distant from high-density cluster areas or were located primarily in habitat on non-Federal lands.

Several figures have been modified to reflect changes resulting from the land exchange that affect spotted owls. Figures 36A and 38A (Pages 52 and 53) show spotted owl habitat within the Planning Area in the years 1996 and 2045, respectively. Spotted owl pair nest site probabilities within the Planning Area for 1996 and 2045 are shown in Figures 40A and 42A (Pages 54 and 55), respectively.

2.3.1.2 MARBLED MURRELET (SECTION 3.2.1.2; HCP)

Despite the extremely low potential for murrelet use of the Planning Area, murrelets may eventually use the Planning Area for nesting and breeding during the Permit period. The murrelet management strategy was developed in conjunction with the Services, and included four actions:

- Harvest Deferrals



- Murrelet Surveys
- Nest Site Protection
- Seasonal Protection

2.3.1.2.1 Murrelet Surveys (supplemental to Section 3.2.1.2, item (2); HCP)

To address the biological requirements of marbled murrelets in the Planning Area following the land exchange, new survey protocols, as described below, are being added to the murrelet management plan:

As stipulated in the HCP (see Section 3.2.1.2; HCP), Plum Creek completed surveys (1994 through 1996) for murrelets on a total of 1,110 acres of suitable habitat in the Planning Area, west of the Cascades crest. Murrelets were not detected during these surveys. During 1994 and 1995, 853 acres of suitable habitat were surveyed following Pacific Seabird Group (PSG) protocol (Ralph et al. 1994). These surveys were conducted as part of the requirements for Plum Creek's road access EIS projects. PSG protocol recommends four survey visits in each of two successive years to reach 97 percent probability of detecting the presence of murrelets at a site (Ralph et al. 1995). During 1995 and 1996, an additional 257 acres of suitable habitat were surveyed following a modified version of the PSG protocol. The modified protocol used by Plum Creek was developed in conjunction with FWS scientists and consisted of three survey visits in each of two successive years. These modified protocols provide a 93 percent probability of detecting the presence of murrelets at a site (Ralph et al. 1995). Additional details regarding the areas surveyed and the survey protocols used is provided in Herter and Hicks (1995).

During 1997 and 1998, Plum Creek conducted murrelet surveys east of the Cascades crest, in the HCP Planning Area. These surveys were conducted in two areas as part of road access projects. During all surveys in 1997 and 1998, no murrelets were detected.

Radar surveys to assess marbled murrelet use of the upper Green River Watershed were completed in 1998 (Hamer Environmental 1998). Ten days of radar surveys with complementary auditory/visual surveys (PSG Murrelet Inland Survey Protocol, Ralph et al. 1994) were completed at six different sites. The radar sites scanned cross-sections of the entire Green River valley at points downriver of the designated murrelet Critical Habitat Units involved in the land exchange.

Results from the ten days of sampling the Upper Green River Watershed with Ornithological radar suggest that the likelihood of murrelets breeding or occupying the upper watershed is very low. Even with the excellent coverage the radar provided across the Green River Valley at six different sites within the Valley, only a single murrelet type target was recorded on three of the ten survey mornings and two murrelet targets were recorded on one other survey. The fact that ground observers did not detect any Marbled Murrelets, that daily murrelet flight activity was not recorded by the radar, and that consistent in-bound and out-bound flight activity was not detected by the radar; all indicate that the probability of murrelets using the upper watershed is very low.

The results indicate that at most a single pair of birds could be using the drainage. The likelihood of these birds occupying the high elevation habitat located 5-7 miles further to the east of these radar detections is very low. It is also possible that some of the murrelet type targets recorded by the radar were waterfowl.

2.3.1.2.2 Post-Land Exchange Marbled Murrelet Surveys on Lands Acquired by Plum Creek

Lands acquired by Plum Creek within the Planning Area as a result of the land exchange with the Forest Service will be evaluated for the presence of marbled murrelets. Plum Creek will use a two-stage process to evaluate which lands within the Planning Area will be surveyed. First, areas west of the Cascade crest that meet the marbled murrelet suitable habitat definition agreed upon by the Services and Plum Creek will be identified. Forest stands will be assessed using timber inventory data and field surveys to determine which stands meet suitable habitat criteria. Secondly, areas identified as suitable murrelet habitat will be surveyed using the protocols outlined in the March 1, 1997, PSG survey protocol or a mutually agreed upon protocol. PSG protocol generally requires four visits to each survey area in each of two successive years to determine presence. Figure 6A (Page 43) shows existing and potential marbled murrelet critical habitat in the vicinity of the Planning Area following the land exchange. Four sections of currently designated critical habitat will go to Plum Creek, but four sections of suitable habitat which are currently owned by the Forest Service and three sections received from Plum Creek may be designated.

Current discussion with the Services indicate approximately 1,300 acres of potential habitat will be ground surveyed using a modified PSG protocol. Surveys will be conducted four times in each of two successive years (total of eight visits) at fifteen to nineteen stations. In addition, radar surveys will be conducted for twelve days each of the two years to supplement the ground surveys. Ground stations will cover about half of the potential habitat. This arrangement will use the ground stations to cover areas with the best viewing, and will rely on radar to cover the remainder.

2.3.1.2.3 Nest Site Protection (Section 3.2.1.2; HCP)

All BMPs and other forest management measures outlined in the HCP will remain in effect following the land exchange, except as indicated below (text taken from Section 3.2.1.2, item (3) of the HCP):

~~*Suitable habitat will be protected in all directions from an occupied stand until a 100-meter break in suitable habitat is encountered; or*~~

[Suitable habitat will be protected in all directions from an occupied stand until a 300 foot break in suitable habitat is encountered. Narrow (i.e., less than 300 foot) areas of suitable habitat will not be considered as “habitat” or as links between larger habitat patches greater than 300 feet apart; or]

This language change is intended to recognize that the protection of suitable habitat surrounding occupied stands should be targeted toward biologically relevant stands. Without this consideration, suitable habitat in riparian corridors could technically link large areas of the landscape that are not biologically relevant to protecting the occupied murrelet stand.

2.3.1.3 GRIZZLY BEAR (SECTION 3.2.1.3; HCP)

As discussed in Section 2.10.3.4 of the HCP, one of the objectives of the Grizzly Bear Recovery Plan (USFWS 1993, appended) is to manage grizzly bears and grizzly bear habitat within this clearly defined recovery zone. To maintain consistency with the goals and objectives of the Federal recovery plan following the land exchange, Plum Creek will continue to concentrate its grizzly bear management efforts within the recovery zone in the I-90 Lakes Subunit within the Planning Area.

All BMPs and other forest management measures outlined in the HCP will remain in effect following the land exchange.



2.3.1.4 GRAY WOLF (SECTION 3.2.1.4; HCP)

All BMPs and other forest management measures outlined in the HCP will remain in effect following the land exchange.

2.3.2 MULTI-SPECIES APPROACH (SECTION 3.2; HCP)

A fundamental objective of Plum Creek's HCP is to address the biological needs of wildlife species known to occur in the Planning Area. To achieve this objective, Plum Creek consolidated 285 terrestrial vertebrate species known, as well as unknown or thought to occur, in the Planning Area into 16 "Lifeforms" similarities in breeding and feeding habitat preferences. For each Lifeform, forest structural classes were assigned as primary and secondary habitat preferences, or as nonhabitat. Eight forest structural classes were developed for use in the HCP, ranging from stand initiation to old growth forests. The stand structure distribution after the land exchange is summarized in Table 30A and Figures 46A, and 48A (Pages 42, 56, and 57). Stand structures by forest class are summarized in Table 30bA (Page 36).

During preparation of the HCP, Plum Creek used the orientation of Lifeform habitat preferences over inventory-based forest structural classes to model and evaluate habitat conditions for multiple wildlife species in the Planning Area for the 50-year HCP period. The information obtained from these analyses was used to identify the potential impacts that implementation of the HCP could have on vertebrate species in the Planning Area, to identify mitigation measures, and to develop measurable criteria for determining the biological success of the HCP.

The estimated percentages of primary and suitable habitat for each Lifeform in the Planning Area resulting from implementation of the HCP for the 50-year HCP period will be altered by the land exchange. Plum Creek lands acquired by the Forest Service will be managed by the Forest Service in accordance with amended National Forest Plans. Likewise, Federal lands acquired by Plum Creek will be managed under Plum Creek's HCP.

Projected percentages of spotted owl habitat and structural stages occurring in the Planning Area as the result of implementation of the HCP following the land exchange are shown in Table 24A (Page 32). The projected percentages of primary and suitable habitat available for each Lifeform in the Planning Area as the result of implementation of the HCP following the land exchange are summarized in Table 26A (Page 33). Modification to the primary and suitable habitat for each Lifeform with implementation of the HCP following the land exchange is discussed below (text taken from Section 3.2.2 of the HCP).

2.3.2.1 LIFEFORM 1 (FISH) (SECTION 3.2.2.1; HCP)

With implementation of the HCP, the amount of aquatic habitat will not change; but, quality habitat and, therefore, amount of usable habitat should increase. Stream buffers in the Planning Area will increase from approximately 61,000 acres to approximately 75,000 acres.

2.3.2.2 LIFEFORM 2 (FROGS AND SALAMANDERS) (SECTION 3.2.2.2; HCP)

With implementation of the HCP, primary habitat for this Lifeform, [Dispersal Forest and older forest] within Plum Creek's RHAs, Forest Service Riparian Reserves, and wetlands will increase from ~~56~~ [64] percent in 1996 to 74 [76] percent in 2045. Suitable habitat will increase from ~~66~~ [75] percent in 1996 to 75 [81] percent in 2045.

2.3.2.3 LIFEFORM 3 (TURTLES AND DUCKS) (SECTION 3.2.2.3; HCP)

Primary habitat for this Lifeform [Dispersal Forest and older forest] within Plum Creek's RHAs, Forest Service Riparian Reserves, and wetlands will increase from ~~56~~ [64] percent in 1996 to ~~74~~ [76] percent in 2045. Suitable habitat will increase from ~~66~~ [75] percent in 1996 to ~~75~~ [81] percent in 2045.

2.3.2.4 LIFEFORM 4 (FALCONS AND GOATS) (SECTION 3.2.2.4; HCP)

Primary habitat for this Lifeform [Pole Timber and older forest surrounding rock and talus areas] will ~~decrease~~ [increase] slightly, from ~~31~~ [49] percent in 1996 to ~~30~~ [53] percent in 2045, with the lowest percentage estimated at ~~24~~ [46] percent in 2016. Suitable habitat also will ~~decrease~~ [increase] slightly, from ~~34~~ [53] percent in 1996 to ~~33~~ [55] percent in 2045 with a reduction to ~~30~~ [51] percent estimated at 2016, 20 years into the Permit period.

2.3.2.5 LIFEFORM 5 (GROUSE, HARES, DEER, ELK) (SECTION 3.2.2.5; HCP)

Results of the analysis indicate that "edge" habitat for Lifeform 5 decreases from ~~85~~ [88] percent of the Planning Area in 1996 to ~~61~~ [71] percent in 2045 (~~Figure 34~~ [Figure 34A, Page 49]).

2.3.2.6 LIFEFORM 6 (WARBLERS, PORCUPINES) (SECTION 3.2.2.6; HCP)

With implementation of the HCP, total potential suitable habitat for this Lifeform in the Planning Area will decrease from ~~46~~ [53] percent in 1996 to ~~39~~ [45] percent in 2045. Primary habitat for Lifeform 6 [Stand Initiation to Young Forest in RHAs] decreases from ~~16~~ [19] percent in 1996 to ~~4~~ [4] percent in 2045.

2.3.2.7 LIFEFORM 7 (SPARROW, BLACKBIRDS, THRUSHES) (SECTION 3.2.2.7; HCP)

Primary habitat for Lifeform 7 [Stand Initiation to Dispersal Forest in RHAs] in Plum Creek's RHAs, Forest Service Riparian Reserves, and wetlands decreases slightly from ~~26~~ [28] percent in 1996 to ~~21~~ [22] percent in 2045. Suitable habitat for this Lifeform along streams and wetlands also decreases slightly from ~~51~~ [57] percent in 1996 to ~~49~~ [54] percent in 2045.

2.3.2.8 LIFEFORM 8 (WARBLERS, FLYCATCHERS) (SECTION 3.2.2.8; HCP)

Primary habitat for Lifeform 8 [Shrub Sapling stage to Pole Timber] will decrease from ~~25~~ [27] percent in 1996 to ~~18~~ [17] percent in 2045. Suitable habitat for this Lifeform will decrease slightly from ~~52~~ [53] percent in 1996 to ~~50~~ [51] percent in 2045.

2.3.2.9 LIFEFORM 9 (WAXWINGS, GROSBEAKS) (SECTION 3.2.2.9; HCP)

Primary habitat for Lifeform 9 [Young Forest, Pole Timber, and Dispersal Forest] in Plum Creek's RHAs, Forest Service Riparian Reserves, and wetlands decreases slightly from ~~25~~ [26] percent in 1996 to ~~21~~ [22] percent in 2045. Suitable habitat for Lifeform 9 remains virtually unchanged during the Permit period from ~~47~~ [52] percent in 1996 to ~~48~~ [54] percent in 2045.

2.3.2.10 LIFEFORM 10 (SQUIRRELS, TANAGERS, WARBLERS) (SECTION 3.2.2.10; HCP)

Primary habitat for Lifeform 10 [Pole Timber and older forest] increases in the Planning Area from ~~60~~ [57] percent in 1996 to 77 percent in 2045. Suitable habitat for this Lifeform increases from ~~69~~ [68] percent in 1996 to ~~80~~ [81] percent in 2045.

2.3.2.11 LIFEFORM 11 (VIREOS, HAWKS, FLYCATCHERS) (SECTION 3.2.2.11; HCP)

Primary habitat for Lifeform 11 [Pole Timber and older forest] increases in the Planning Area from ~~60~~ [57] percent in 1996 to 77 percent in 2045. Suitable habitat for this Lifeform also increases from ~~74~~ [72] percent in 1996 to ~~83~~[82] percent in 2045.

2.3.2.12 LIFEFORM 12 (HERONS, OSPREYS, GREAT HORNED OWLS) (SECTION 3.2.2.12; HCP)

Primary habitat for Lifeform 12 [Dispersal Forest and older forest] in Plum Creek's RHAs, Forest Service Riparian Reserves, and wetlands will increase from ~~56~~ [64] percent in 1996 to ~~74~~ [76] percent in 2045. Suitable habitat (which adds only pole timber to primary habitat) shows a similar trend, increasing from ~~58~~ [66] percent in 1996 to ~~75~~ [79] percent in 2045.

2.3.2.13 LIFEFORM 13 AND 13A (WOODPECKERS AND NUTHATCHES) (SECTION 3.2.2.13; HCP)

Primary habitat for Lifeform 13 [Dispersal Forest and older forest] will increase in the Planning Area from ~~53~~ [52] percent in 1996 to ~~64~~ [67] percent in 2045. Suitable habitat for Lifeform 13 also will increase from ~~65~~ [64] percent in 1996 to ~~73~~ [75] percent in 2045. Primary habitat for Lifeform 13a [Mature Forest and older forest] will ~~remain virtually unchanged~~ [increase] in the Planning Area, ranging from ~~36~~ [39] percent in 1996 to ~~35~~ [46] percent in 2045. Suitable habitat for Lifeform 13a will increase more dramatically, from ~~45~~[46] percent in 1996 to ~~58~~ [64] percent in 2045.

2.3.2.14 LIFEFORM 14 AND 14A (BATS, OWLS, BLUEBIRDS) (SECTION 3.2.2.14; HCP)

Primary habitat for Lifeform 14 [Dispersal Forest and older forest] will increase in the Planning Area, from ~~53~~ [52] percent in 1996 to ~~64~~ [67] percent in 2045. Suitable habitat for Lifeform 14 will increase ~~slightly~~ from ~~74~~ [70] percent in 1996 to ~~76~~ [77] percent in 2045. Primary habitat for Lifeform 14a [Mature forest and older forest] will ~~remain nearly unchanged, ranging~~ [increase] from ~~36~~ [39] percent in 1996 to ~~35~~ [46] percent in 2045. Suitable habitat for Lifeform 14a will increase from ~~45~~[46] percent in 1996 to ~~50~~ [57] percent in 2045.

2.3.2.15 LIFEFORM 15 (SHREWS, BEARS, VOLES) (SECTION 3.2.2.15; HCP)

With implementation of the HCP, early-aged habitat (e.g., stand initiation, shrub/sapling, and young forest) for Lifeform 15 will decrease from ~~28~~ [30] percent in 1996 to ~~11~~ [10] percent in 2045, while middle-aged (e.g., pole timber and dispersal forest) and late-aged (e.g., mature forest, managed old growth, and old growth) habitat will change from ~~24~~ [18] percent and ~~36~~ [38] percent in 1996 to ~~42~~ [31] percent and ~~35~~ [46] percent in 2045, respectively.

2.3.2.16 LIFEFORM 16 (KINGFISHERS, OTTERS AND BEAVERS) (SECTION 3.2.2.16; HCP)

Primary habitat for Lifeform 16 [Dispersal Forest and older forest] in Plum Creek's RHAs, Forest Service Riparian Reserves, and wetlands will increase from ~~56~~ [64] percent in 1996 to ~~74~~ [76] percent in 2045. Suitable habitat for this Lifeform also will increase from ~~66~~ [75] percent in 1996 to ~~75~~ [81] percent in 2045.

2.3.3 IMPACTS OF THE HCP (SECTION 3.5; HCP)

As a result of the land exchange, the impacts of the HCP will change for the species discussed below.

2.3.3.1 NORTHERN SPOTTED OWL (SECTION 3.5.1.1; HCP)

Text taken from Section 3.5.1.1 of the HCP:

Of the ~~107~~ [106] spotted owl site centers in the vicinity of the Planning Area, only 67 [40] site centers contain significant amounts (i.e. 100 acres or more) of habitat, within a 1.8-miles radius, on Plum Creek's lands, and are known to have been occupied recently by pairs or singles (Table 22 [A, Page 8]). Among the 67 [40] sites, 17 [14] are unlikely to be affected by Plum Creek's forest-management activities because they contain adequate habitat on Federal lands (Section 3.2.1.1).

Among the remaining 50 [26] sites, Plum Creek will defer harvest, for at least 20 years, in selected core nesting areas and use selective harvesting in the surrounding foraging areas at 30 [11] of the 50 [26] sites.

*(1) **Trends in amount and type of owl Habitat** — As displayed in Table 26 [24A (Page 32)] and discussed in Section 3.2.1.2, total spotted owl habitat in the HCP will increase on Plum Creek's lands. Total habitat for spotted owls [in the Planning Area] will decrease slightly during the first 20 years of the plan, from 48 [47] percent in 1996 to 40 [41] percent in 2016. For the following 30 years (i.e., 2016 through 2045) total habitat for spotted owls in the Planning Area will increase from 40 [41] percent to 61 [53] percent.*

The type of spotted owl habitat provided by the HCP and the Northwest Forest Plan is also important to evaluate potential impacts to spotted owls. NRF habitat will decrease slightly in the Planning Area during the first 20 years, from 28 [29] percent in 1996 to 23 [26] percent in 2016, and increase slightly during the final 30 years of the plan to 26 [28] percent in 2045, for a net decrease of 2[1] percent anticipated over the Permit period. Similarly, FD habitat will decrease slightly in the first two decades, from 20 [18] percent in 1996 to 17 [15] percent in 2016, but will increase significantly to 35 [25] percent by 2045.

*(3) **Carrying capacity for spotted owls** —*

The model was then applied to habitat only within the HCP boundary and calibrated to estimate the number of sites that would likely support pairs (Figures 40 through 42). This application yielded an estimate of 87[88] pairs in 1996, decreasing 16 [5] percent to 73 [84] mid-way through the planning period and subsequently increasing to 80 [89] pair sites by 2045. Based on these conservative estimates, implementation of the HCP will have some impacts on the long-term capacity of the landscape to support spotted owls.

*(4) **Dispersal habitat** —*

As discussed above, dispersal habitat is projected to increase from 20 [18] to 35 [25] percent in the Planning Area over the Permit period.

2.3.3.2 LARCH MOUNTAIN SALAMANDER (SECTION 3.5.2.2; HCP)

Text taken from Section 3.5.2.2 of the HCP:

Larch Mountain Salamander

With implementation of the HCP, timbered stands (e.g. pole timber to old growth) around talus slopes on Plum Creek's land will ~~decrease~~ [increase] slightly (39 [49] percent in 1996 to 34 [53] percent in 2045), ~~but old growth will increase from 6 to 9 percent.~~

2.3.3.3 NORTHERN GOSHAWK (SECTION 3.5.2.4; HCP)

Text taken from Section 3.5.2.4 of the HCP:

Northern Goshawk

A total of 18 goshawk site centers are known in the Planning Area, based on historical observations and recent survey data, applying similar criteria for persistence and behavior used to designate spotted owl site centers. ~~Six~~ [One] of these site centers ~~are~~ [is] on Plum Creek's land in the Planning Area. The strategy employed in the HCP to protect goshawks and avoid impacts includes the following three components:

- (1) **Harvest Deferrals** — Harvest in ~~the six~~ [this] management units which currently contain[s] goshawk sites will be deferred for at least 20 years. ~~These six~~ [This] management units ~~are~~ [is] located on the east side of the Cascades ~~and range between 30 and 65 acres in size~~. The harvest deferrals will protect all known goshawk sites on Plum Creek's land in the Planning Area. The purpose of the 20-year deferral period is to maintain habitat around the known sites until structural classes that can support goshawk sites (e.g., dispersal, mature, managed old growth, old growth) are more abundant in the Planning Area.*
- (2) **Habitat Management** — Goshawks use all spotted owl habitat types (i.e., NRF and FD), with some nesting occurring in both habitat types. As a result of implementation of the HCP, goshawk nesting habitat (i.e., primary habitat approximates NRF and secondary habitat approximates FD ; therefore, "suitable" habitat is roughly equivalent to NRF habitat plus one-half FD habitat) is projected to increase from ~~40~~ [37] percent of ~~Plum Creek's land~~ [Planning Area] in 1996 to ~~55~~ [41] percent in 2045. Thus, goshawks will benefit from the fundamental HCP strategy to increase the amount and distribution of spotted owl habitat.*

2.4 OWNERSHIP CHANGES IN RIPARIAN AREAS

Plum Creek and the Forest Service utilize similar, but different, strategies for managing riparian areas in the HCP Planning Area. Riparian areas owned by Plum Creek are managed in accordance with the Riparian Management Strategy (Section 3.3; HCP) and riparian areas under Federal ownership are managed in accordance with the NWFP's Aquatic Conservation Strategy (ACS).

The riparian protection strategies used by Plum Creek and the Forest Service on lands within the HCP Planning Area have many elements in common for managing riparian areas and wetlands. They both use stream classification, regulatory best management practices (BMPs), and riparian management areas to classify and protect stream beneficial uses such as fish-bearing and domestic water supplies, nonfish-bearing perennial streams, and nonfish-bearing intermittent streams. They differ mainly in riparian width and activities allowed in these zones. Supplemental Table B highlights the differences in width requirements for riparian management areas on National Forest System and Plum Creek’s lands.

*Table B. Width requirements (in feet) for Riparian Management Areas on National Forest System and Plum Creek lands within the HCP Planning Area**

Stream Category	Northwest Forest Plan ACS Buffers	Plum Creek’s HCP Buffers
Fish-bearing (Approximate DNR Types 1-3)	300 feet slope distance	200 feet horizontal distance
Nonfish-bearing, Perennial (Approximate DNR Type 4)	150 feet slope distance	100 feet ¹ horizontal distance
Nonfish-bearing, Seasonal (Approximate DNR Type 5)	100 feet slope distance	Variable ²

* On both Federal and private lands, riparian management areas can be adjusted for site-specific conditions based on information evaluated during Watershed Analysis. Unlike ACS buffers, Plum Creek’s HCP buffers are interim and minimum buffers.

¹ A small percentage (about 4 percent) of perennial streams west of the Cascade crest receive a 25-foot Riparian Leave Tree Area (RLTA), whereas, other small streams west of the Cascade crest (about 5 percent) receive no pre-designed buffer. Watershed analysis may require buffers or larger buffers in some areas.

² Inner gorges are protected and leave trees are generally clumped along smaller streams not otherwise protected. Watershed analysis may require buffers or larger buffers in some areas.

2.4.1 RIPARIAN MANAGEMENT STRATEGY (SECTION 3.3; HCP)

Plum Creek’s Riparian Management Strategy identifies riparian forests as priority areas for fish and wildlife habitat protection. The Riparian Management Strategy is designed to protect instream habitat for resident and anadromous fish and maintain streamside habitat for wildlife species in Riparian Habitat Areas (RHAs). The Riparian Management Strategy incorporates Washington Forest Practice Rules (FPRs) (Section 3.3.1; HCP), Watershed Analysis (Section 3.3.2; HCP), Riparian Habitat Protection (Section 3.3.3; HCP), Harvest Deferrals (Section 3.3.4;HCP), and Aquatic Resources Monitoring (Section 3.3.5;HCP).

Of the 301 less miles of streams that Plum Creek will own in the Planning Area, approximately 229 less miles occur within the Snoqualmie Pass AMA, 66 less miles occur within the LSR, and 4 less miles occur in Matrix. The miles of DNR stream types within each NWFP designated category and Matrix on Plum Creek’s lands in the Planning Area are shown in Table 27A (Page 34).

As a result of the land exchange, the total miles of streams on Plum Creek land in the HCP Planning Area will decrease from 1,405 to 1,103. Plum Creek will manage 81 instead of 116 miles of fish-bearing streams (DNR Type 1-3), 175 instead of 212 miles of perennial nonfish-bearing streams (DNR Type 4), and 847 instead of 1,076 miles of DNR Type 5 streams or unclassified streams (DNR Type 9). All streams and



associated riparian areas on Plum Creek's lands will be managed under the HCP's Riparian Management Strategy. Table 28A (Page 34) shows the approximate miles and percentages of DNR stream types that will be managed in accordance with Federal, Plum Creek's, and other riparian protection strategies in the Planning Area following the land exchange.

Riparian management has been and will continue to be an important focus for adaptive management and research/monitoring efforts in the HCP. Since implementation in 1996, several areas of interest regarding riparian management strategies in the HCP have emerged. For instance, the role and management of small streams, which may be narrow and open perennial for at least a portion of their length, will be investigated relative to the importance in supporting fish and wildlife resources in the HCP area. Information gained from research and monitoring efforts authorized by the HCP will be used to refine management guidelines in the future.

2.4.2 AQUATIC CONSERVATION STRATEGY (SECTION 1.5.2; HCP)

Riparian areas on Federal lands in the HCP Planning Area are governed by the Aquatic Conservation Strategy (ACS). This strategy was developed under the NWFP to restore and maintain the ecological health of watersheds within the range of the spotted owl. The primary components of the ACS are Riparian Reserves (Section 1.5.2.1; HCP), Key Watersheds (Section 1.5.2.2; HCP), Federal Watershed Analysis (Section 1.5.2.3; HCP), and Watershed Restoration (Section 1.5.2.4; HCP).

2.4.3 CONSISTENCY BETWEEN PLUM CREEK AND FEDERAL MANAGEMENT STRATEGIES

The strategy that will be implemented by the Forest Service on National Forest System lands acquired in Plum Creek's HCP Planning Area will be supplemented by implementation of Plum Creek's HCP on lands acquired by Plum Creek from the Forest Service in the Planning Area. Plum Creek's HCP management strategy "tiers" off the measures outlined in the NWFP and ACS by developing standards and guidelines that are different but complimentary to the standards and guidelines in the NWFP. This strategy increases the potential success of the NWFP, is consistent with the objectives of SPAMA, and minimizes cumulative effects by ensuring the HCP's compatibility with adjacent National Forest Systems lands.

Plum Creek's Riparian Habitat Areas (RHAs), as described in the Riparian Management Strategy (Section 3.3; HCP) compliment the Riparian Reserves on National Forest System lands, thereby reducing cumulative adverse effects (such as reductions in LWD, excessive water temperatures, and increases in siltation) of forest management on adjacent private lands. In the long-term, Plum Creek's management strategies will improve water quality and fish habitat conditions above the levels that would be attained if forests on Plum Creek's lands were managed only under current state forest practices.

The ACS provisions required for National Forest System lands will provide the microclimate and shading necessary to maintain cool water temperatures by maintaining wide streamside buffers. These wide buffers will also ensure the availability of LWD for recruitment to fish- and nonfish-bearing streams and minimize the delivery of sediment to stream channels. The wide buffers specified by Plum Creek's Riparian Management Strategy will also ensure adequate LWD from riparian corridors and minimize sediment delivery to streams. In addition, they will provide adequate shade for fish-bearing streams and buffering for unstable slopes. As a result of measures being implemented on National Forest lands as part of the ACS, and measures being implemented on private lands as part of Plum Creek's HCP, water quality and fish habitat should improve throughout the project area and cumulative effects should be minimal.

2.5 MITIGATION AND MEASURABLE CRITERIA (SECTION 3.6; HCP)

Mitigation measures include the actions Plum Creek will take to minimize and avoid impacts to species addressed in the HCP (see Section 3.6; HCP). These actions include steps taken to develop the plan as well as actions proposed to monitor and address impacts after implementation of the Plan. Mitigation in a multi-species, habitat-based plan is inextricably woven into the Plan itself. The following constitute some basic elements of mitigation for Plum Creek's lands within the Planning Area that have been modified by Plum Creek or by the Services (see Appendices 1 and 2), or will be modified following the land exchange (text taken from Section 3.6 of the HCP).

2.5.1 SPOTTED OWL (SECTION 3.6.1; HCP)

- (2) *NRF Maintenance (MC)* – Plum Creek will maintain target percentages for NRF habitat for each decade of the Permit period (~~Table 24~~ [Table 24A (Page 32)]), and at a minimum, maintain 8 [6] percent of its ownership in the Planning Area as NRF habitat.
- (3) *NRF Deferrals (MC)* – ~~2,600~~ [300] acres of current NRF habitat will be deferred from harvest for at least 20 years near key spotted owl sites in the Planning Area (Section 3.2.1.1).
- (4) *FD Corridors (MC)* – ~~3,200~~ [1,100] acres of current NRF and FD habitat will be retained as FD corridors to facilitate dispersal and linkage to additional habitat on Plum Creek and Federal lands (Section 3.2.1.1)
- (5) *Riparian Habitat Areas (MC)* – ~~5,600~~ [2,700] acres of forestland adjacent to perennial streams will be maintained as spotted owl habitat (NRF or FD) during the Permit period.
- (9) *Seasonal Protection* – ~~Known owl~~ sites [with active spotted owl nests] in the Planning Area will receive protection within a 0.25-mile radius from March 1 through August 31. [(see U.S. Fish and Wildlife Service letter dated June 6, 1998; Appendix 1).]

2.5.2 MARBLED MURRELET (SECTION 3.6.5; HCP)

- (10) *Murrelet Surveys (MC)* – Multi-year surveys to detect presence on 1,110 acres of potential murrelet habitat on Plum Creek and forest Service ownership in the Planning Area will be completed in 1996. [After the land exchange, surveys will be conducted on lands which the Services and Plum Creek have identified as suitable habitat and when the appropriate protocol has been agreed upon.]
- (11) *Murrelet Habitat Harvest Deferrals (MC)* – Timber harvest will be deferred on the 257 acres in the Planning Area being surveyed in 1995 and 1996 until the surveys are completed. [Harvest on lands to be surveyed after the land exchange will be deferred until the surveys are complete.]

2.5.3 OTHER SPECIES (SECTION 3.6.5; HCP)

- (17) *Goshawk Nest Protection (MC)* - Plum Creek will defer harvest of ~~274~~ [69] acres of habitat currently supporting goshawk sites on Plum Creek's land, for at least 20 years (Section 3.5.2.4). ~~For additional nest sites that may be found in the Planning Area during routine harvest planning and layout, harvesting would be delayed within a 0.25-mile radius from March 1 until August 31. Known sites with active goshawk nests in the Planning Area will receive protection within a 0.25-mile radius from March 1 through August 31 [(see U.S. Fish and Wildlife Service letter dated June 6, 1997, Appendix 1)].~~



2.5.4 RIPARIAN MANAGEMENT (SECTION 3.6.7; HCP)

- (25) *Watershed Analysis (MC)* – *Watershed analysis will be accelerated in 20 watersheds in the Planning Area and evaluations, subject to SEPA review, will be submitted up to 5 [10] years following issuance of the Permit. [In the Green River subbasin, watershed analysis has been completed for all units except the North Fork of the Green. Until the analysis is completed for that area, and when it is appropriate, existing watershed analysis prescriptions will be used in locations comparable to locations already analyzed.]*
- (26) *Riparian Habitat Areas (MC)* – ~~10,900~~ [6,200] *acres of forest adjacent to perennial streams have been placed in RHAs on Plum Creek's lands in the Planning Area.*
- (27) *303(d) Harvest Deferrals (MC)* – *Harvest will be deferred on 667 acres of riparian forest adjacent to stream segments listed as water quality limited until completion of watershed analysis. [Subsequent additions to listed streams since approval of the HCP have been in areas where watershed analysis has been completed.]*

2.6 MONITORING (SECTION 5.1; HCP)

Modifications to monitoring described in the HCP as a result of the land exchange are discussed below (text taken from Sections 5.1.2, 5.1.3, and 5.1.6 of the HCP).

2.6.1 SPOTTED OWL MONITORING (SECTION 5.1.2; HCP)

Scope

Model and deferral validation surveys will be conducted in 10 to 15 percent of the Planning Area to reestablish contact and locate all spotted owl nest sites in areas sampled. Survey areas will be distributed in LSR, AMA, and Matrix landscapes within the [North] Green River, ~~I-90 Lakes~~, [Twin Camp, Teanaway], and Taneum subunits of the Planning Area [(see Supplemental Figures A and B, pages 37 and 39). Note that although the I-90 Lakes area is being dropped the other areas are being expanding resulting in approximately the same total area being surveyed.] Survey methodology will be determined with the FWS and will incorporate a 2-visit survey sequence each season (i.e., about May 1 to June 30), surveying of likely habitat, and use of appropriately distanced calling stations (i.e., 0.25- to 0.5-mile distance between calling stations). Spotted owl sites within the survey areas that were targeted with deferrals will be monitored for occupancy for the duration of the deferral period. ~~Approximately 16 deferrals which support 9 sites~~ [Ten of the 11 NRF deferral or FD corridors sites] are included in the survey areas. Sites discovered during surveys would be checked later in the season to determine nesting success/productivity. As additional owls are located, they may be banded, at the discretion of Plum Creek, to facilitate identification upon later sightings.

2.6.2 MARBLED MURRELET MONITORING (SECTION 5.1.3; HCP)

Surveys of potential murrelet habitat in the Planning Area, west of the Cascades crest, will be completed ~~in the first year following issuance of the Permit~~ [prior to harvest].

2.6.3 AQUATIC RESOURCES MONITORING (SECTION 5.1.6; HCP)

Response reach locations will be established by Plum Creek in the following streams in the Green River and Yakima River Subbasins.

Green River Subbasin	Yakima River Subbasin
<i>Sawmill Creek</i>	<i>North Fork Little Naches River</i>
<i>Sunday/Snow Creeks</i>	<i>Big Creek</i>
<i>Upper Green River</i>	<i>Taneum Creek</i>
<i>North Fork Green River</i>	<i>Cabin Creek</i>
	<i>Meadow Creek</i>
	<i>Box Canyon Creek</i>
	<i>French Cabin Creek</i>
	<i>West Fork Teanaway Creek</i>

2.7 COVERED LANDS

The legal description of all lands that will be “covered” by Plum Creek’s HCP and the ITP following the land exchange is located in Appendix 3, which replaces Appendix 1 of the original HCP document. Covered lands include land and timber harvest rights owned by Plum Creek.



SECTION 3: REFERENCES

- Hamer Environmental. 1998. Use of radar to determine the presence or absence of marbled murrelets in the Green River Watershed, Washington. Final Report to Plum Creek Timber Company, L.P. Seattle, Washington. 14 pp.
- Herter, D.R., L.L. Hicks, and B. Melton. 1995. Review process for spotted owl site centers in the Plum Creek Cascades HCP Project Area. Tech. Report No. 3, Plum Creek Timber Company, L.P., Seattle, Washington. 29 pp.
- Herter, D.R. and L.L. Hicks. 1995. Marbled murrelet surveys and occurrence in the HCP Study Area. Tech. Report No. 2, Plum Creek Timber Company, L.P., Seattle, Washington. 17 pp.
- Irwin, L. and L. L. Hicks. 1995. Estimating potential impacts of timber harvesting on spotted owls in the Plum Creek Cascades HCP project area. Tech. Report No. 6. Plum Creek Timber Company, L.P., Seattle, Washington. 98 pp.
- Lundquist, R., V.S. Kelly, S.T. White, and R. Fleming. 1995. Assessment of Special emphasis wildlife species and other wildlife species of concern for the Plum Creek Habitat Conservation Plan. Tech. Report No. 8. Plum Creek Timber Company, L.P., Seattle, Washington. 74 pp.
- Lujan, M., D.R. Knowles, J. Turner, and M. Plenart. 1992b. Recovery plan for the northern spotted owl - final draft. USDI, Fish and Wildlife Service, Portland, Oregon.
- Oliver, C., R. Greggs, S. Boyd, and L.L. Hicks. 1995. Forest stand structure classification system developed for the Plum Creek habitat conservation plan. Tech. Report No. 10, Plum Creek Timber Company, L.P., Seattle, Washington. 30 pp.
- Plum Creek Timber Company, L.P. 1996. Multi-Species Habitat Conservation Plan on Forestlands owned by Plum Creek Timber Company, L.P. in the I-90 Corridor of the Central Cascades Mountain Range, Washington. Plum Creek Timber Company, L.P., Seattle, Washington.
- Ralph, J.C., K.S. Nelson, M.M. Shaughnessy, S.L. Miller, and T. E. Hamer. 1994. Methods for surveying for marbled murrelets in forests: a protocol for land management and research. Pacific Seabird Group, Marbled Murrelet Technical Committee. 30 pp.
- Ralph, J.C., K.S. Nelson, S.L. Miller, and T. E. Hamer. March 8, 1995. Letter to Marbled Murrelet Surveyors and Managers. Pacific Seabird Group. 5 pp.
- Toth, S., G. Watson, and L.L. Hicks. 1995. Watershed protection strategy for fisheries within Plum Creek's Habitat Conservation Plan project area. Tech. Report No. 12. Plum Creek Timber Company, L.P., Seattle, Washington.

- USDA Forest Service and USDI Bureau of Land Management. 1994. Record of Decision for amendments to Forest Service and Bureau of Land Management planning documents within the range of the northern spotted owl; Standards and guidelines for management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl. USDA, U.S. Forest Service and USDI, Bureau of Land Management, Portland, Oregon.
- USDA Forest Service; Wenatchee, Mt. Baker-Snoqualmie, and Gifford Pinchot National Forests (USFS). 1998. I-90 Land Exchange, USDA Forest Service/Plum Creek Timber Company, L.P., Draft Environmental Impact Statement. Wenatchee National Forest, Wenatchee, WA; Mt Baker-Snoqualmie National Forest, Mountlake Terrace, WA; and Gifford Pinchot National Forest, Vancouver, Washington.
- USDA Forest Service; Wenatchee and Mt. Baker-Snoqualmie National Forests. 1997. Record of Decision for the Snoqualmie Pass Adaptive Management Area Plan, Final Environmental Impact Statement. USDA Forest Service, Wenatchee National Forest, Cle Elum Ranger District, Kittitas County, and Mt. Baker-Snoqualmie National Forest, North Bend Ranger District, King County, Washington.
- USFWS. 1993. Conservation of the northern spotted owl; intent to prepare an environmental impact statement. Federal Register, Vol. 58, No. 248. December 29, 1993.
- Watson, G. and S. Toth. 1995. Limiting factor analysis for salmonid fish stocks in Plum Creek's Cascades Habitat Conservation Plan (HCP) area. Tech. Report No. 13. Plum Creek Timber Company, L.P., Seattle, Washington. 58 pp.

Tables

Modifications to Plum Creek Timber Company's Cascades Habitat Conservation Plan (HCP) as a Result of a Land Exchange with the U.S. Forest Service

Table 2A. Post-Land Exchange. Habitat type within major ownerships in Designated Conservation Areas (DCAs) within the Planning Area.

OWNERSHIP		HABITAT TYPE (ACRES)			TOTAL
		Non-Habitat	FD	NRF	
WESTERN WASHINGTON CASCADES PROVINCE					
WD-7	Plum Creek	8,001	2,939	3,784	14,724
	USFS	3,040	3,354	6,341	13,335
	Other	175	156	126	457
	Water	0	0	0	0
	Total	11,216	7,049	10,251	28,516
WD-8	Plum Creek	1,687	144	46	1,876
	USFS	2,677	118	2,639	5,490
	Other	1,420	172	1,185	2,777
	Water	0	0	0	1
	Total	5,784	434	3,926	10,144
EASTERN WASHINGTON CASCADES PROVINCE					
WD-39	Plum Creek	4,007	1,560	1,197	6,764
	USFS	25,708	13,365	24,788	63,861
	Other	130	120	21	271
	Water	479	0	0	479
	Total	30,324	15,045	26,006	71,375
WD-40	Plum Creek	6,124	1,311	4,050	11,485
	USFS	7,642	5,511	14,903	28,056
	Other	90	0	189	279
	Water	0	0	0	0
	Total	13,856	6,822	19,142	39,820

NOTE: FD - Foraging and Dispersal Habitat; NRF - Nesting, Roosting, and Foraging Habitat

This table includes only that portion of each DCA inside the boundaries of Plum Creek's HCP Planning Area.

Table 4A. Post-Land Exchange. Acres of land ownership in each of the designated areas under the Northwest Forest Plan within the Planning Area.

Designated Area	USFS	%	Plum Creek	%	Other	%	Water	%	TOTAL
Congressionally Reserved Area	9,276	3.8	115	0.1					9,391
Late-Successional Reserve	62,170	26.4	32,101	24.5	3,857	8.5			98,128
Adaptive Management Area	121,847	51.8	36,405	27.8	12,643	27.9	6,561	100	177,456
Managed Late-Successional Area	26	0.0							26
Administratively Withdrawn Area	4,486	1.9			6	0.0			4,492
Matrix	37,879	16.1	34,870	26.6	8,215	18.1			80,964
Not designated			27,662	22.0	20,569	45.4			48,231
TOTALS	235,684	100	131,153	100	45,290	100	6,561	100	418,688
Percent of Total HCP Area		56.3		31.3		10.8		1.6	100.0

NOTE: USFS – U.S. Forest Service

Designated Areas and Matrix applicable to Federal lands only

Table 22A. Post-Land Exchange. Prioritization of spotted owl sites.

Prioritization Criteria	Number of Owl Sites	Owl Sites Remaining
Total spotted owl sites in and around the Planning Area	109 (107) ¹	109 (107)
Site centers decertified by WDFW	3	106
Site centers more than 1.8-miles from the Planning Area boundary	3 (3)	103 (104)
Sites with no habitat on Plum Creek's land in a 1.8-mile circle	14 (2)	89 (102)
"Single status unknown" sites where recent surveys show no owls	8 (9)	81 (93)
Verified pair or single sites occupied only one year or two years, breeding never documented	3 (4)	78 (89)
Resident single sites verified as unoccupied	6 (5)	72 (84)
Adequate Federal habitat and no Plum Creek habitat within 0.7-miles	22 (6)	50 (78)
Pair sites with no daytime sightings for 4 years	2 (2)	48 (76)
Sites with less than 100 acres of Plum Creek habitat between the 0.7- and 1.8-mile radius	8 (9)	40 (67)
Plum Creek harvest likely will not affect owl sites due to Federal core habitat ²	14 (17)	26 (50)
Plum Creek deferrals of NRF habitat for 20 years will ensure owl site viability ^{3,4}	11 (30)	15 (20)
Sites on or adjacent to Plum Creek's lands that will be impacted within 20 years of Permit issuance ^{5,6}	15 (20)	0

NOTE: Factors influencing the last three prioritization criteria

¹ Numbers in parentheses are taken from the Table 22 in the HCP.

² Adequate NRF habitat existed on Federal land per the RSPF model (Irwin and Hicks 1995).

³ Priority for 20-year deferral sites was given to high density clusters in AMA and LSR.

⁴ 28 of 30 deferral sites were occupied in 1994.

⁵ 13 of 20 "impact" sites were vacant in 1994.

⁶ Some "impact" site centers were converted to FD habitat only to maintain connectivity between and within clusters.

Table 24A. Post-Land Exchange. Estimated percentages of Plum Creek (PC) and all ownerships (HCP) in the Planning Area providing spotted owl habitat and forest structural stages as a result of modification of the HCP. Percentages are estimated and displayed by decade for the 50-year Permit period.

Category*	Year											
	1996		2006		2016		2026		2036		2045	
	PC	HCP										
Spotted Owl Habitat												
NRF	18	29	9	27	6	26	6	27	6	28	7	28
F/D	14	18	10	15	8	15	16	19	26	23	31	25
Total (Percent)	32	47	19	42	14	41	22	46	32	51	38	53
Structural Stages												
SI/SS/YF	51	30	63	32	47	22	32	15	23	11	27	12
Pole Timber	8	5	8	6	28	15	32	15	31	14	22	10
Dispersal Forest	13	13	10	10	9	11	20	16	28	19	30	20
MF/MOG/OG	23	39	14	39	11	39	10	41	13	43	15	45
Non-Forested	5	13	5	13	5	13	5	13	5	13	5	13
Total (Percent)	100											

*NOTES: Goals for spotted owl habitat and structural stages will be achieved if measurements are within 10 to 20 percent of the values estimated in the table.

NRF - Nesting/Roosting/Foraging

FD - Foraging/Dispersal

SI - Stand Initiation

SS - Shrub/Sapling

YF - Young Forest

MF - Mature Forest

MOG - Managed Old Growth

OG - Old Growth

Table 26A. Post-Land Exchange. Estimated percentages of all ownerships in the Planning Area providing primary (P) and total suitable habitat (SH) for each lifeform resulting from modification of the HCP. Percentages are estimates and displayed by decade for the 50 year Permit period.

Lifeform	Year											
	1996		2006		2016		2026		2036		2045	
	P ¹	SH ²	P	SH								
2	64	75	65	76	69	78	72	79	76	81	76	81
3	64	75	65	75	69	78	72	79	76	81	76	81
4	49	53	46	51	48	52	52	54	52	54	53	55
5	88		89		85		81		75		71	
6	19	53	15	51	9	48	8	47	6	46	4	45
7	28	57	26	56	28	57	27	57	24	55	22	54
8	27	53	32	56	35	60	28	57	22	54	17	51
9	26	52	25	53	26	55	27	57	24	55	22	54
10	57	68	55	68	65	75	72	79	77	81	77	81
11	57	72	55	71	65	76	72	80	77	82	77	82
12	64	66	65	68	69	73	72	75	76	78	76	79
13	52	64	48	61	50	66	57	70	63	74	67	75
13a	39	46	38	50	39	60	41	62	43	64	46	64
14	52	70	48	68	50	69	57	72	63	75	67	77
14a	39	46	38	43	39	45	41	49	43	53	48	57
15 (early)	30		32		22		15		10		10	
15 (middle)	18		17		26		31		34		31	
15 (late)	39		38		39		41		43		46	
16	64	75	65	76	69	78	72	79	76	81	76	81

¹ - Percentage of the HCP search area containing Primary Habitat

² - Percentage of the HCP search area containing Suitable Habitat = Primary Habitat + (Secondary Habitat/2)

³ - Percentage of the HCP Planning Area within 0.5-miles of an "edge" between forage and cover habitats

⁴ - Expresses the percentage of habitat in the HCP Planning Area containing early, middle, and late-aged forests.

Search Area: RHAs only (Lifeforms 1,2,3,6,7,9,12,16); Rocks and Talus (Lifeform 4); Entire Planning Area (Lifeforms 8,10,11,13,13a,14,14a,15)

Table 27A. Post-Land Exchange. Miles of DNR stream types within each Northwest Forest Plan designated category on Plum Creek’s land in the Planning Area

DNR Stream Type	Northwest Forest Plan Category			
	AMA	LSR	Matrix	TOTAL
1 - 3	21	23	20	64
4	54	36	44	134
5	132	167	133	432
9	108	48	63	219
TOTAL	315	274	260	849

NOTE: AMA - Adaptive Management Areas; LSR - Late Successional Reserves

Stream Type 9 – unclassified or unknown stream status

Table 28A. Post-Land Exchange. Approximate miles and percentage of DNR stream types within each riparian protection strategy by ownership in the Planning Area.

Stream Type	U.S. Forest Service			Plum Creek Timber Company, L.P.					Other Private			Total
	300' RCA	150' RCA	Sub-Total	200' RHA	100' RHA	25' RLTA	No Buffer	Sub-Total	Std. RMZ	No Buffer	Sub-Total	
1	14 (24%)		14	10 (17%)				10	35 (59%)		35	59
2	45 (87%)		45	6 (12%)				6	1 (2%)		1	52
3	114 (55%)		114	65 (32%)				65	27 (13%)		27	206
4		265 (53%)	265		147 (29%)	28 (6%)		175	64 (13%)		64	504
5		848 (56%)	848				539 (35%)	539		139 (9%)	139	1526
9 ^b		413 (50%)	413				308 (38%)	308		98 (12%)	98	819
Total	173	1526	1699	81	147	28	847	1103	127	237	364	3166

^a Watershed analysis will require buffers on streams prone to landslides/debris flows.

^b Type 9 streams are currently unclassified or of unknown status; however, the vast majority of Type 9 streams would likely be classified as Type 5 streams.

Std. – Standard

RMZ – Riparian Management Zone

RCA – Riparian Conservation Area

RLTA – Riparian Leave Tree Area

RHA – Riparian Habitat Area

Table 30A. Post-Land Exchange. Estimated percentage of each structural stage for the entire Planning Area, Riparian Habitat Areas (RHAs), and rocks and talus slopes.

Habitat Area	1996		2006		2016		2026		2036		2045	
	PC ¹	HCP ²	PC	HCP								
HCP³												
Non Habitat	5	13	5	13	5	13	5	13	5	13	5	13
Stand Initiation	3	8	9	7	9	3	7	2	8	3	11	4
Shrub/Sapling	9	3	16	6	12	4	6	2	4	1	8	2
Young Forest	40	18	39	18	27	16	20	11	11	7	8	5
Pole Timber	8	5	8	6	27	15	31	15	31	14	22	10
Dispersal Forest	13	13	10	10	9	11	20	16	29	20	32	20
Mature Forest	17	26	10	22	8	19	8	20	9	20	11	22
Managed Old Growth	3	8	2	11	2	12	2	12	2	13	2	14
Old Growth	2	6	1	7	1	7	1	9	1	9	1	10
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100
RHAs⁴												
Non Habitat	6	15	6	15	6	15	6	15	6	15	6	15
Stand Initiation	2	6	0	5	0	0	0	0	0	0	0	0
Shrub/Sapling	5	1	2	1	1	2	0	0	0	0	0	0
Young Forest	31	10	33	9	19	7	8	8	3	6	2	4
Pole Timber	11	3	10	6	21	8	26	5	22	4	15	5
Dispersal Forest	13	12	16	10	18	11	21	12	29	13	32	11
Mature Forest	23	33	24	27	26	27	29	27	29	27	34	28
Managed Old Growth	5	11	5	16	5	18	5	18	6	20	5	21
Old Growth	4	9	4	11	4	12	5	15	5	15	6	16
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100
TALUS⁵												
Non Habitat	23	44	23	44	23	44	23	44	23	44	23	44
Stand Initiation	1	2	6	2	4	1	3	0	5	1	5	1
Shrub/Sapling	1	0	18	4	8	1	1	0	5	1	1	0
Young Forest	17	5	8	4	23	7	14	4	4	2	6	2
Pole Timber	11	4	13	4	14	4	29	7	28	6	11	3
Dispersal Forest	20	12	11	9	10	8	9	9	15	9	33	11
Mature Forest	22	23	18	20	15	19	16	19	15	19	15	18
Managed Old Growth	4	7	2	8	2	11	4	11	5	12	4	15
Old Growth	1	3	1	5	1	5	1	6	1	6	2	6
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100

NOTES:

¹ Percentage of ownership, Plum Creek

² Percentage of all ownerships in the HCP Planning Area

³ Search area within entire HCP Planning Area

⁴ Search area within Riparian Habitat Areas and wetlands

⁵ Search area within Plum Creek's management units containing rock and talus slope areas

Table 30bA. Projected structural stages of major forest classes in the planning area over time based upon the post-land exchange ownership.

HCP	
Forest Class	Acreage
DF-WH	93,120
NF-SF	66,201
NF/SF/SA	39,187
DF-GF	147,883
PP-LP	18,075
DECID	1,553
Non-forested	52,666
Total	418,685

HCP – Forest Classes						
Structural Stage	DF-WH			NF-SF		
	1996	2016	2045	1996	2016	2045
SI	13%	1%	1%	9%	9%	12%
SS	0%	11%	7%	15%	2%	1%
YF	23%	21%	7%	29%	26%	10%
PT	5%	21%	22%	5%	21%	15%
DF	22%	10%	22%	10%	9%	23%
MF	26%	25%	30%	19%	20%	26%
MOG	1%	1%	2%	3%	2%	1%
OG	10%	9%	9%	10%	11%	12%
Structural Stage	NF/SF/SA			DF-GF		
	1996	2016	2045	1996	2016	2045
SI	7%	9%	12%	7%	0%	1%
SS	7%	1%	0%	0%	4%	2%
YF	22%	19%	4%	19%	14%	5%
PT	5%	11%	9%	4%	15%	6%
DF	12%	12%	19%	13%	12%	25%
MF	27%	18%	17%	36%	22%	22%
MOG	13%	23%	23%	15%	24%	27%
OG	6%	8%	16%	5%	8%	11%
Structural Stage	PP-LP			DECID		
	1996	2016	2045	1996	2016	2045
SI	0%	2%	2%	8%	0%	0%
SS	1%	0%	1%	0%	6%	1%
YF	13%	7%	2%	7%	9%	3%
PT	19%	9%	5%	27%	15%	12%
DF	10%	24%	18%	25%	28%	21%
MF	41%	27%	29%	29%	41%	50%
MOG	13%	27%	36%	3%	1%	12%
OG	4%	5%	9%	0%	1%	1%

Structural stage percentages are based on the total acreage with each forest class

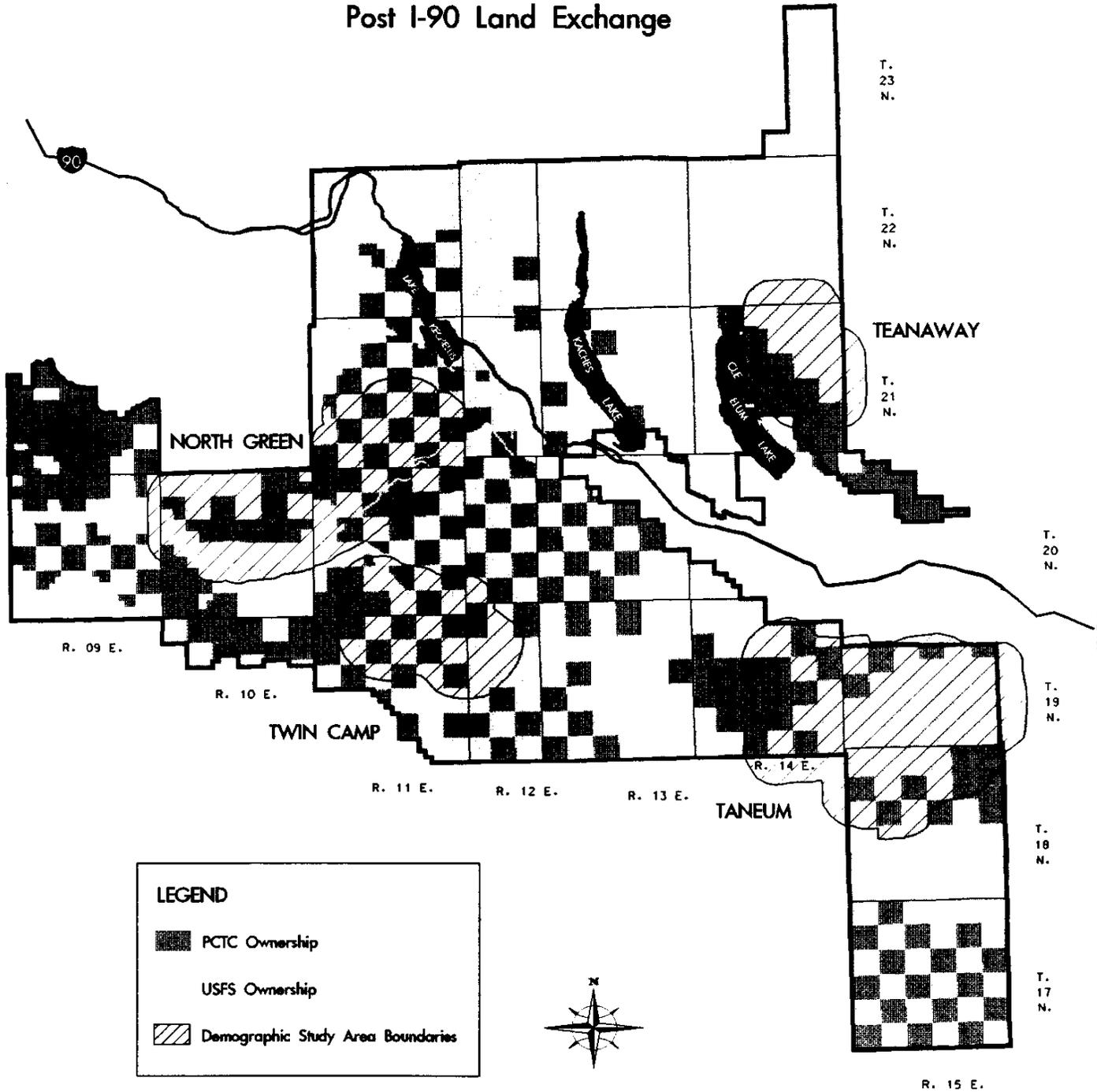
Figures

Modifications to Plum Creek Timber Company's Cascades Habitat Conservation Plan (HCP) as a Result of a Land Exchange with the U.S. Forest Service

Figure A

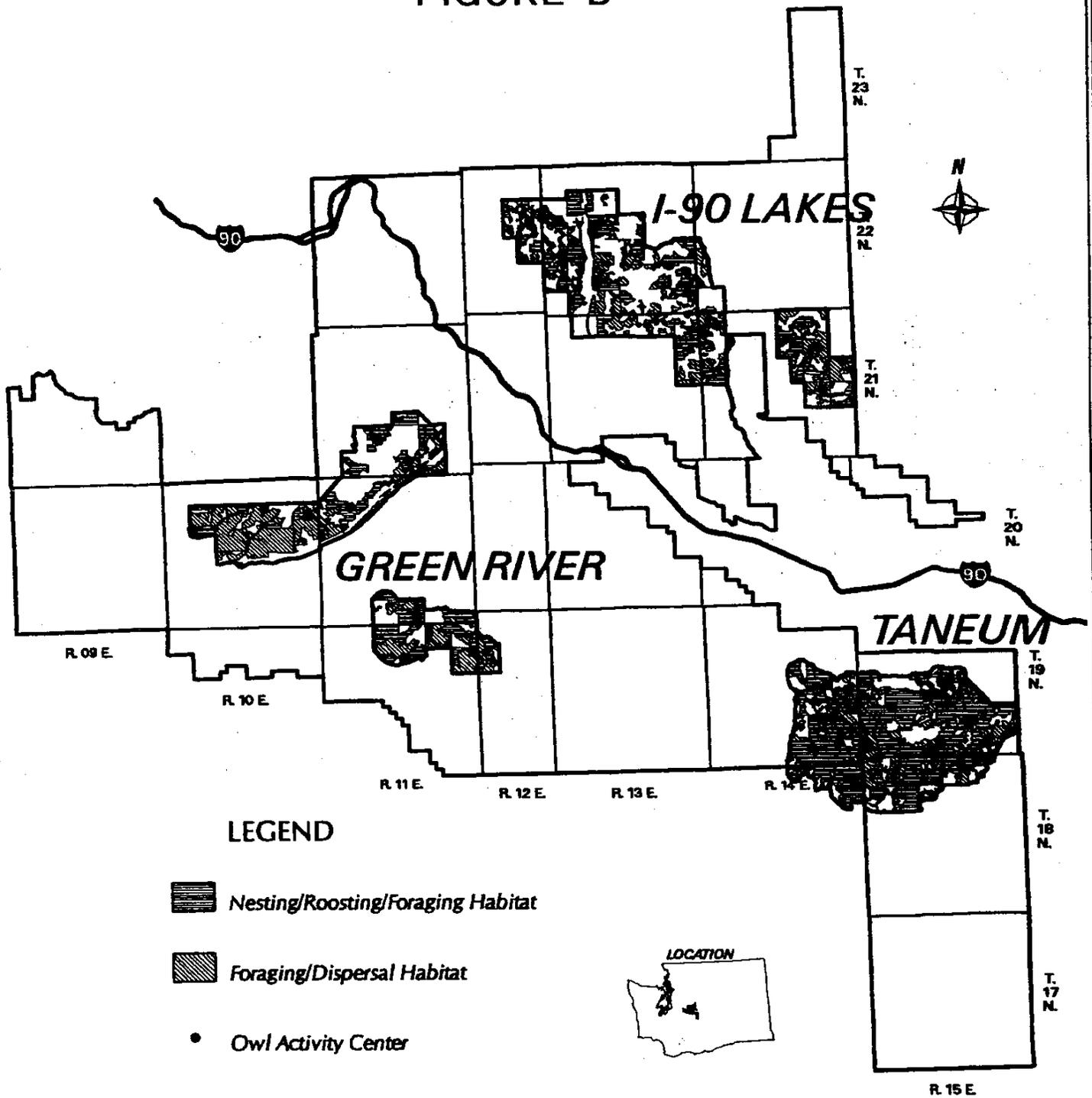
Northern Spotted Owl Monitoring Demographic Study Areas

Post I-90 Land Exchange



PRE I-90 LAND EXCHANGE HCP Spotted Owl Demographic Monitoring Areas

FIGURE B



LEGEND

-  Nesting/Roosting/Foraging Habitat
-  Foraging/Dispersal Habitat
-  Owl Activity Center



FIGURE 6A

Marbled Murrelet Critical Habitat in the Vicinity of Plum Creek's HCP Planning Area.

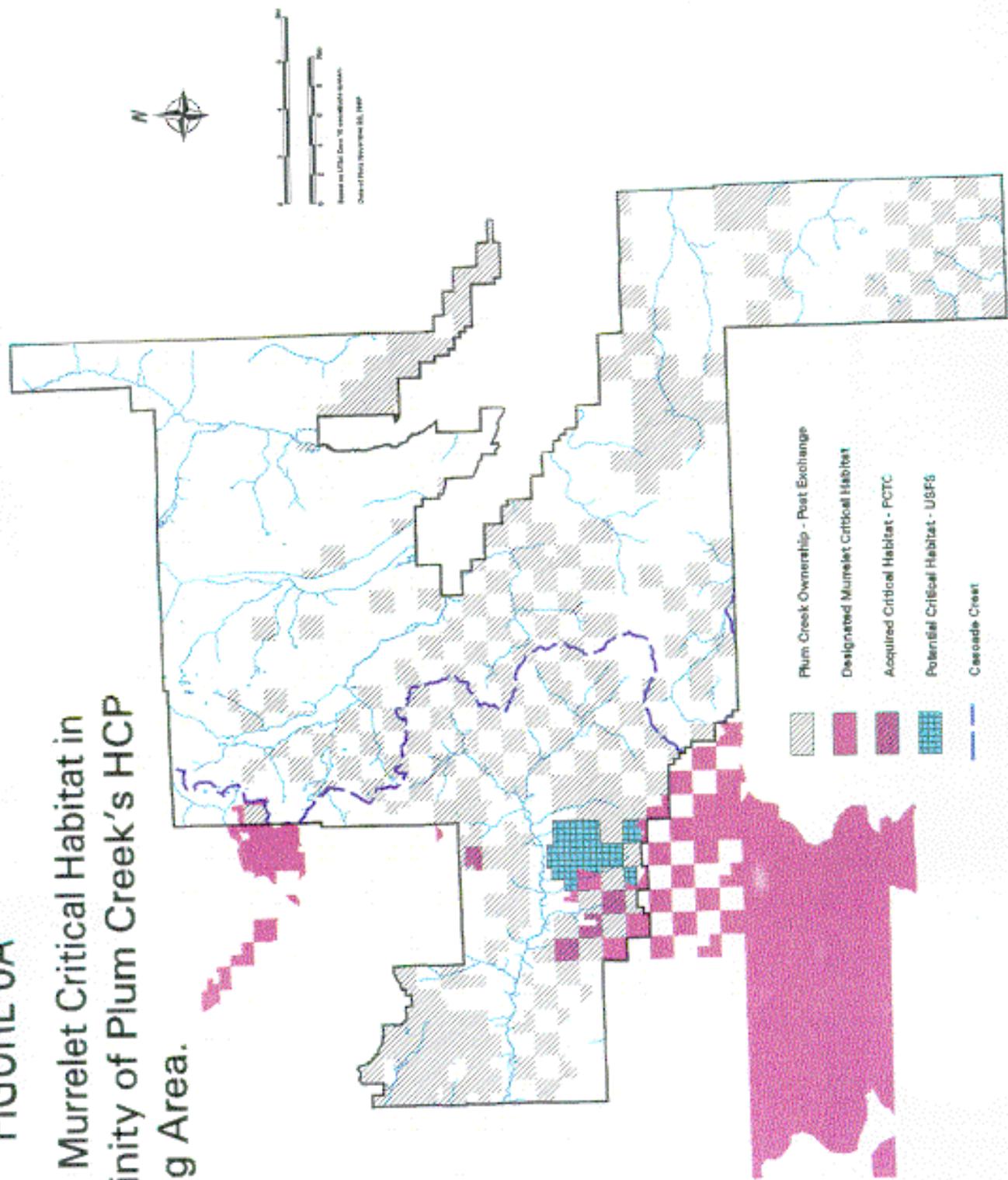
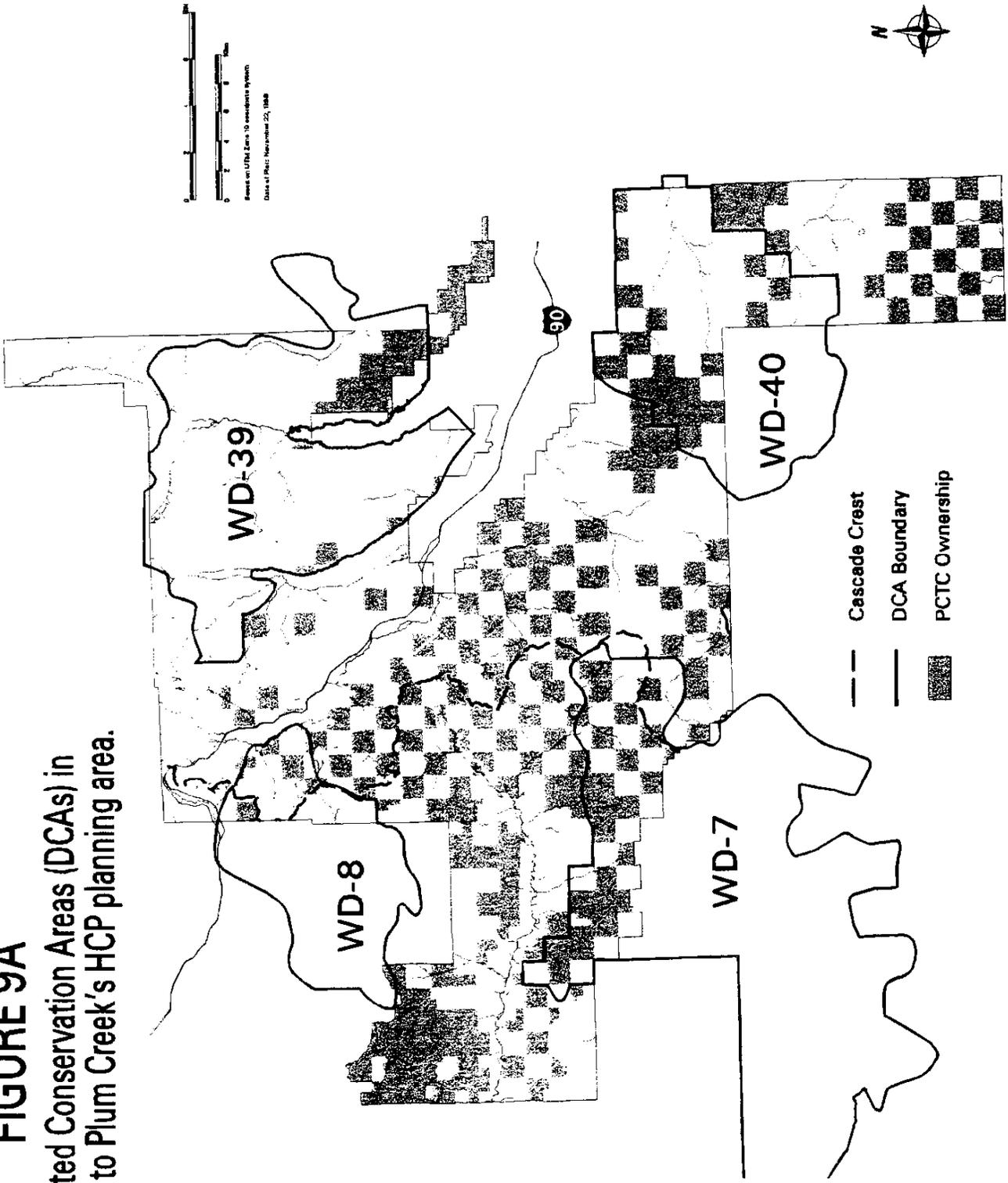


FIGURE 9A

Designated Conservation Areas (DCAs) in Proximity to Plum Creek's HCP planning area.



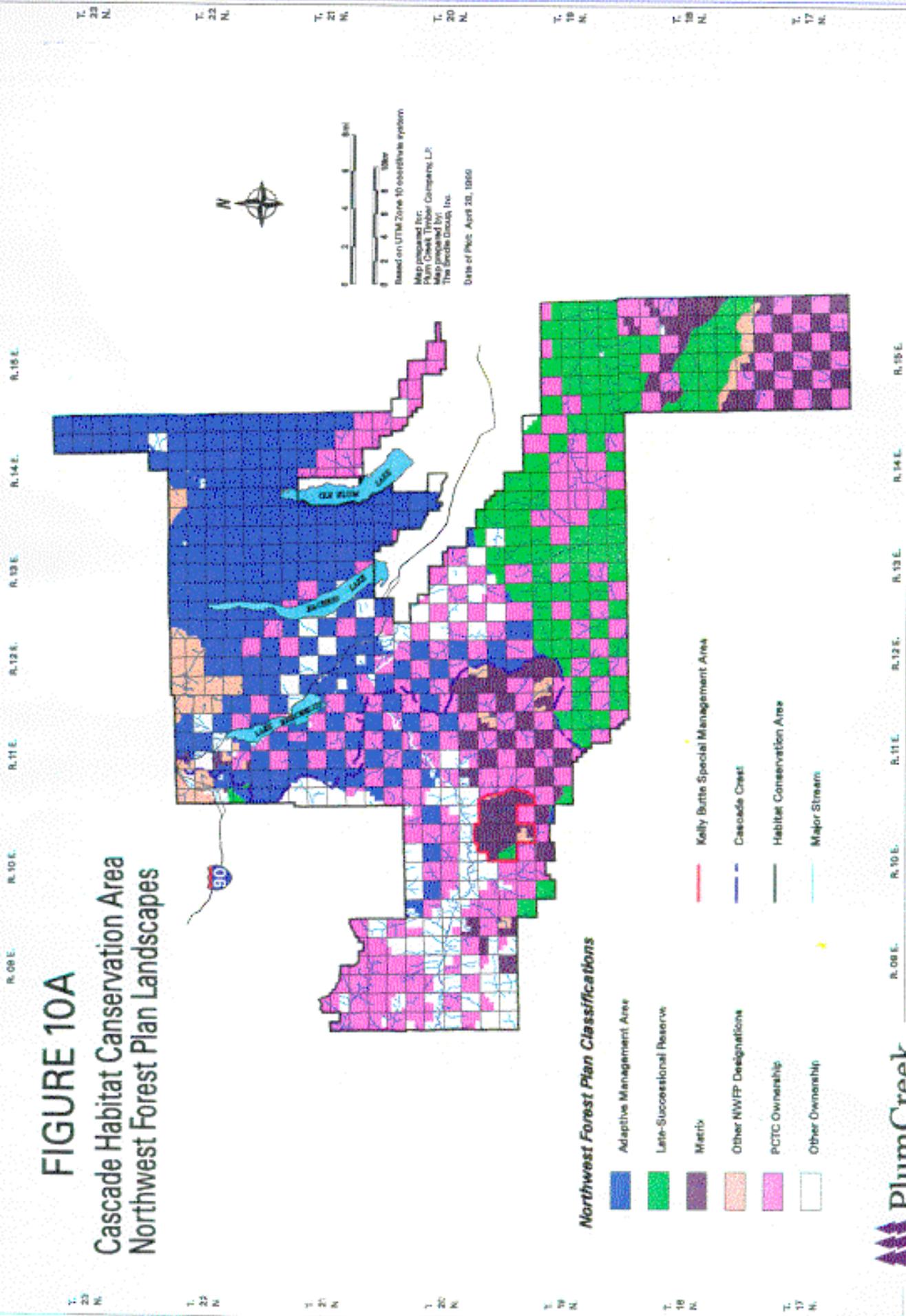


FIGURE 10A
Cascade Habitat Conservation Area
Northwest Forest Plan Landscapes

Northwest Forest Plan Classifications

- Adaptive Management Area
- Late-Successional Reserve
- Matrix
- Other NWFP Designations
- PCTC Ownership
- Other Ownership
- Kelly Butte Special Management Area
- Cascade Crest
- Habitat Conservation Area
- Major Stream

FIGURE 34-A
Cascade Habitat Conservation Area
 Life Form 5 (Big Game, Snowshoe Hares, etc.)
 Based on 0.5 Mile Radius Moving Window Analysis

 Suitable Habitat

Map prepared for:
 Plum Creek Timber Company, L.P.
 Prepared by:
 The Brodie Group, Inc.
 Date of Plot: April 13, 1999

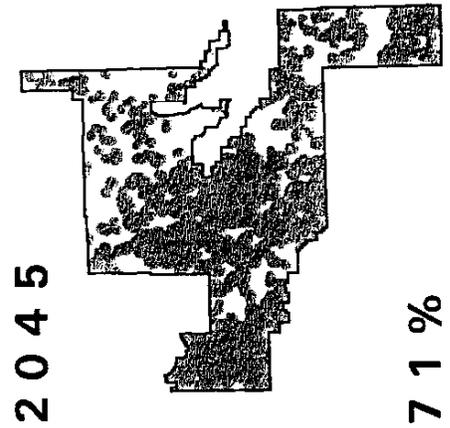
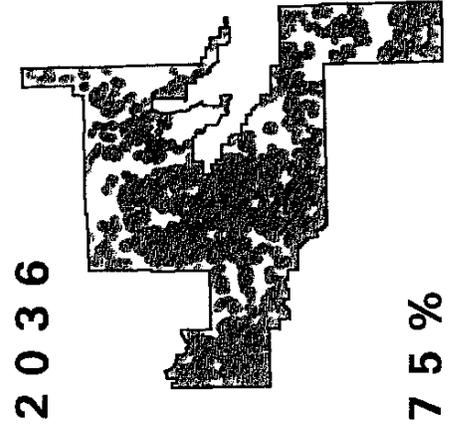
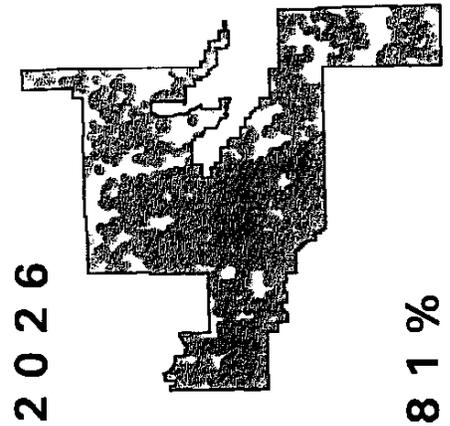
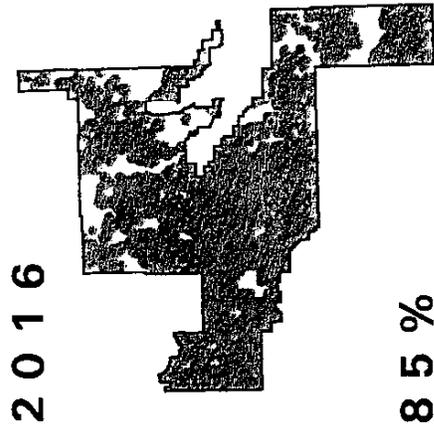
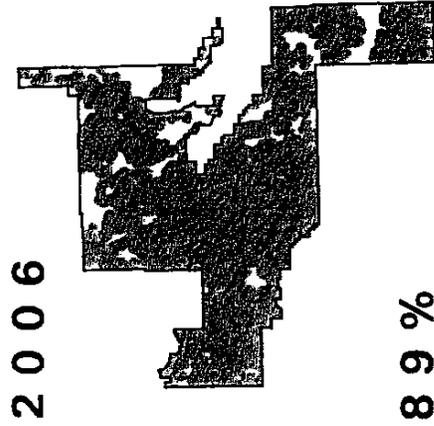
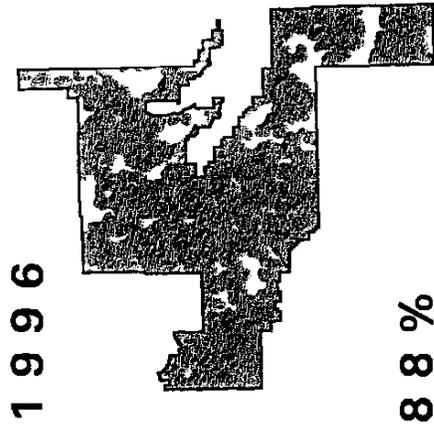
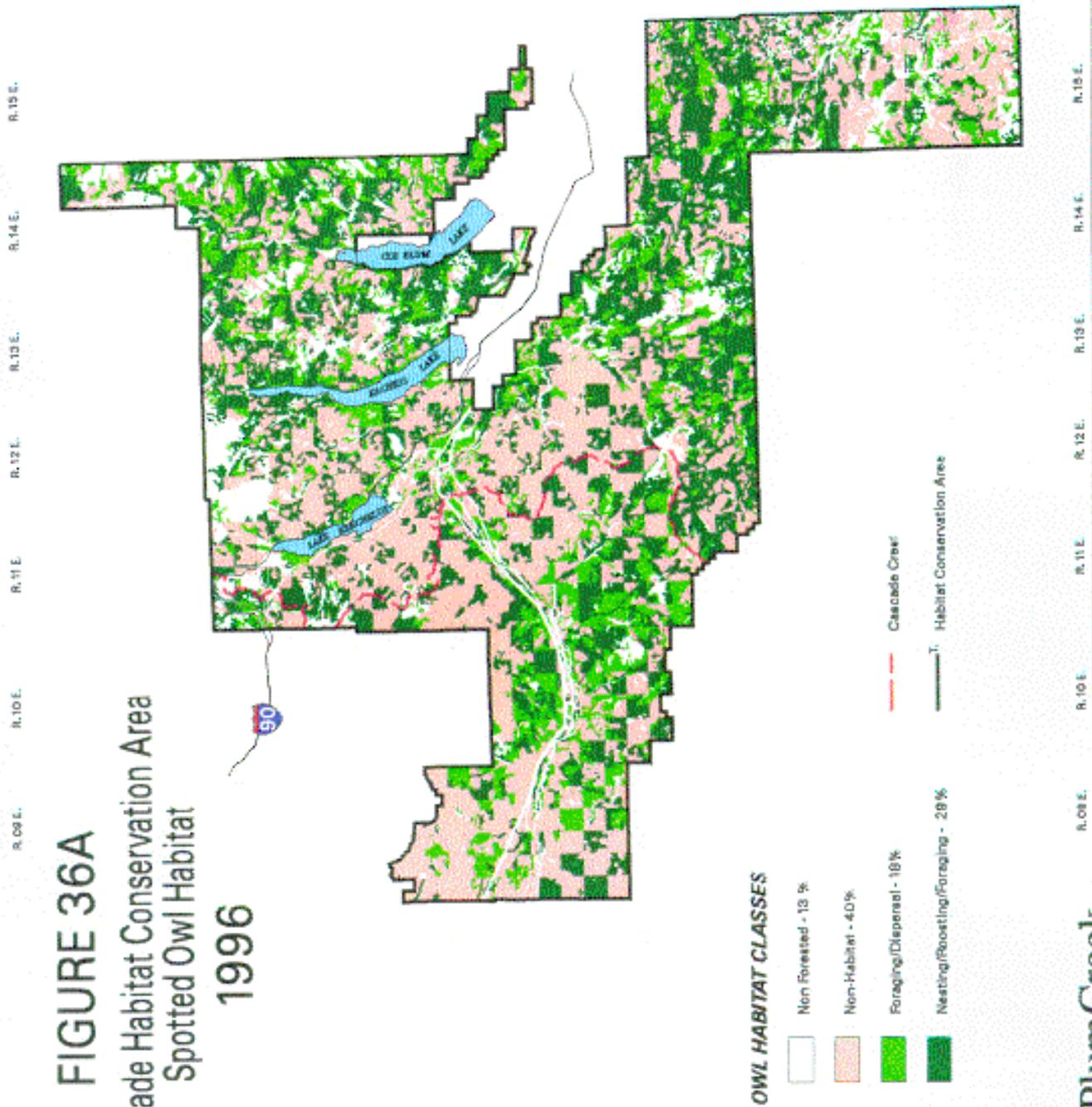


FIGURE 36A

Cascade Habitat Conservation Area

Spotted Owl Habitat

1996



OWL HABITAT CLASSES

- Non Forested - 13 %
- Non-Habitat - 4.0%
- Foraging/Dispensal - 18%
- Nesting/Boosting/Foraging - 28%
- Cascade Creek
- Habitat Conservation Areas

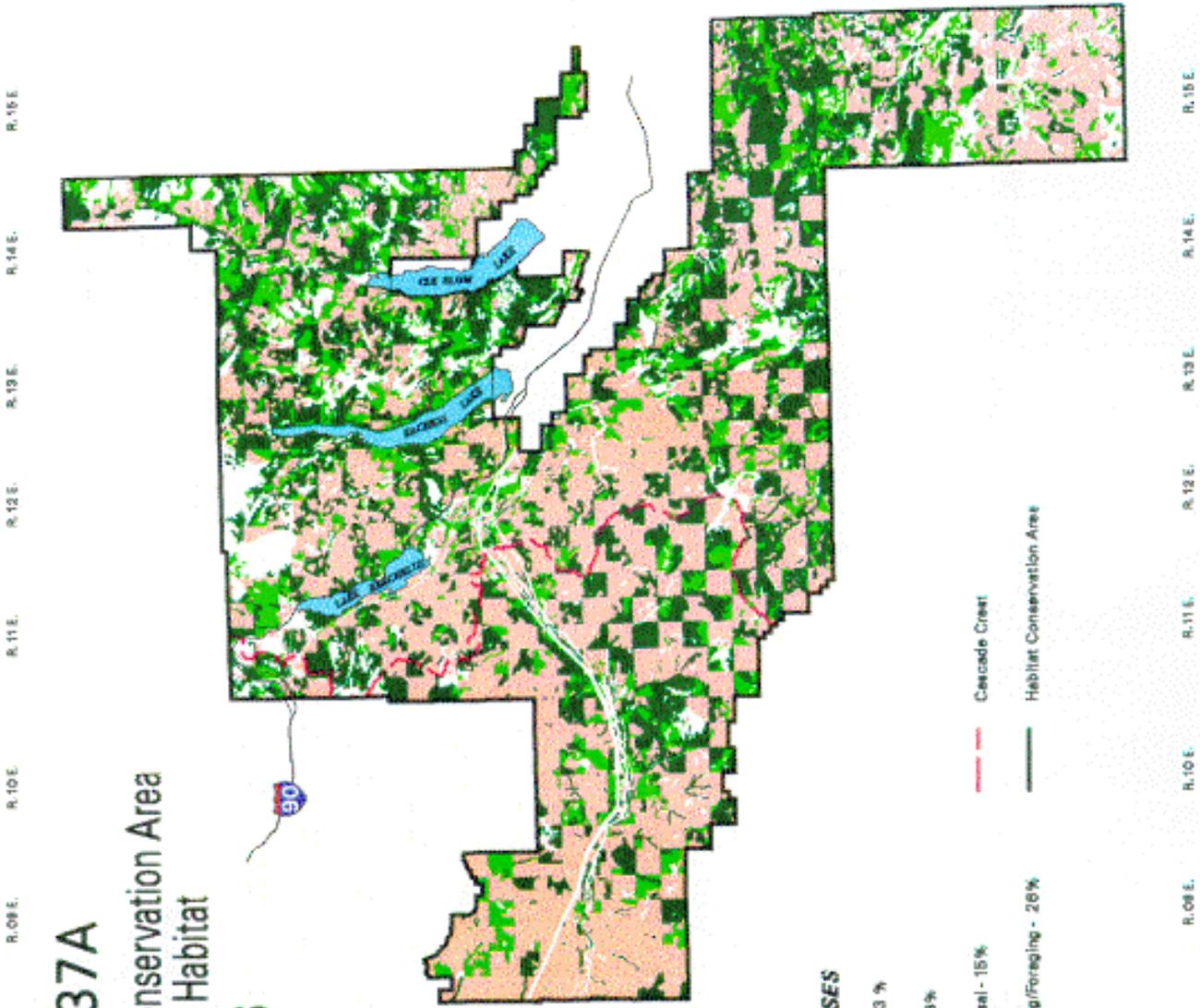


Based on UTM Zone 18 coordinates system
 Map prepared for:
 Plum Creek Timber Company, L.P.
 Map prepared by:
 The Ince Group, Inc.
 Date of Photo Aerials: 10/09



FIGURE 37A

Cascade Habitat Conservation Area Spotted Owl Habitat 2016



OWL HABITAT CLASSES

- Non-Forested - 13 %
- Non-Habitat - 46%
- Foraging/Dispersal - 15%
- Nesting/Roosting/Foraging - 26%
- Cascade Crest
- Habitat Conservation Area

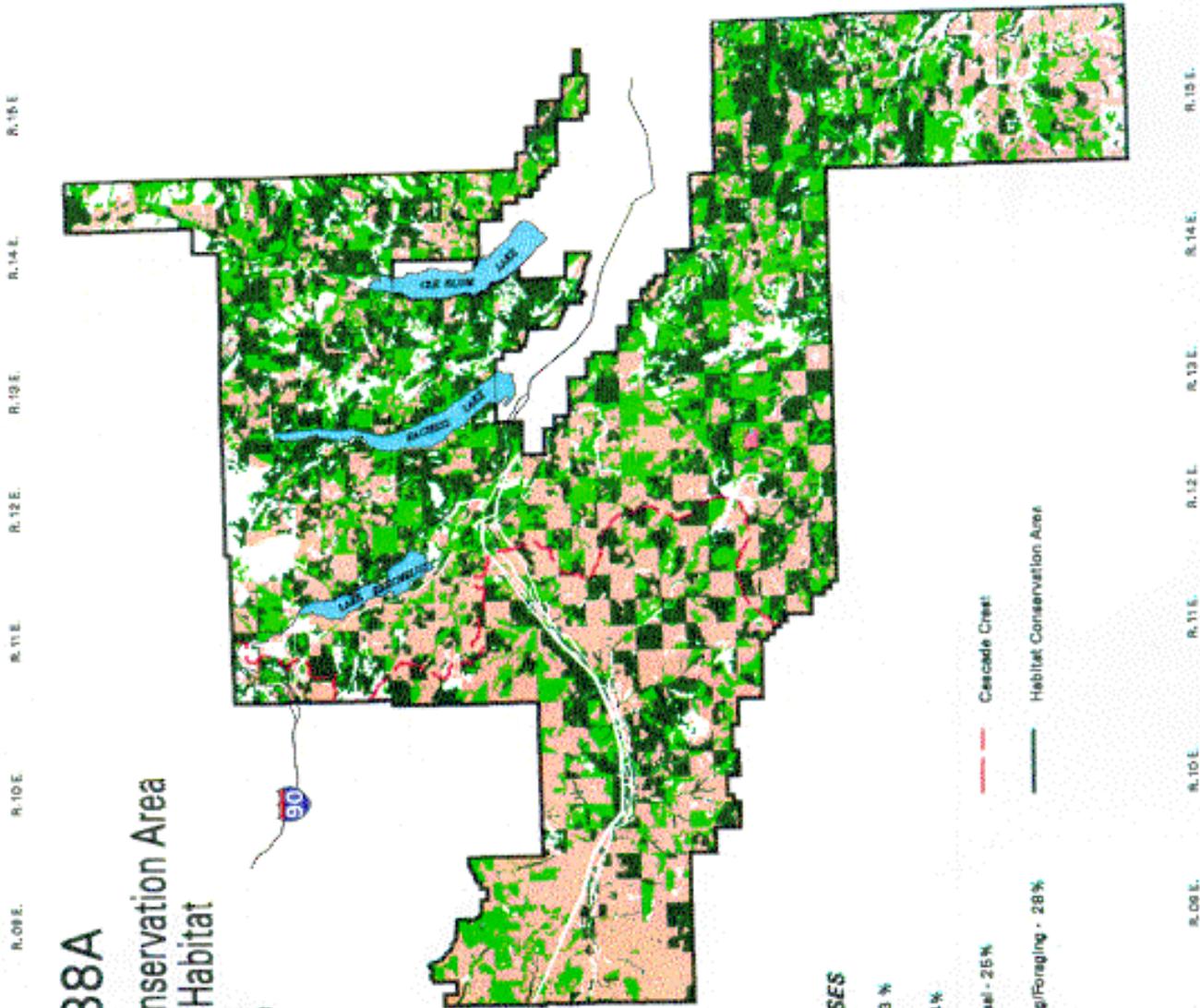


Based on UTM Zone 10 geotiff system
 Map prepared for:
 Plum Creek Timber Company, L.P.
 The Woodlands, TX
 Date of Plot: April 13, 2016



FIGURE 38A

Cascade Habitat Conservation Area Spotted Owl Habitat 2045



OWL HABITAT CLASSES

- Non-forested - 13%
- Non-Habitat - 34%
- Foraging/Dispersal - 25%
- Nesting/Roosting/Foraging - 28%
- Cascade Creek
- Habitat Conservation Areas



Based on UTM Zone 10 coordinate system
Map prepared for
Plum Creek Timber Company, L.P.
Map prepared by
The Bobbie Olovik Inc
Date of Plot: April 13, 1999

T. 23 N. T. 22 N. T. 21 N. T. 20 N. T. 19 N. T. 18 N. T. 17 N.

R. 09 E. R. 10 E. R. 11 E. R. 12 E. R. 13 E. R. 14 E. R. 15 E.

T. 23 N. T. 22 N. T. 21 N. T. 20 N. T. 19 N. T. 18 N. T. 17 N.



FIGURE 40A

Cascade Habitat Conservation Area Spotted Owl Pair Nest Site Probability 1996

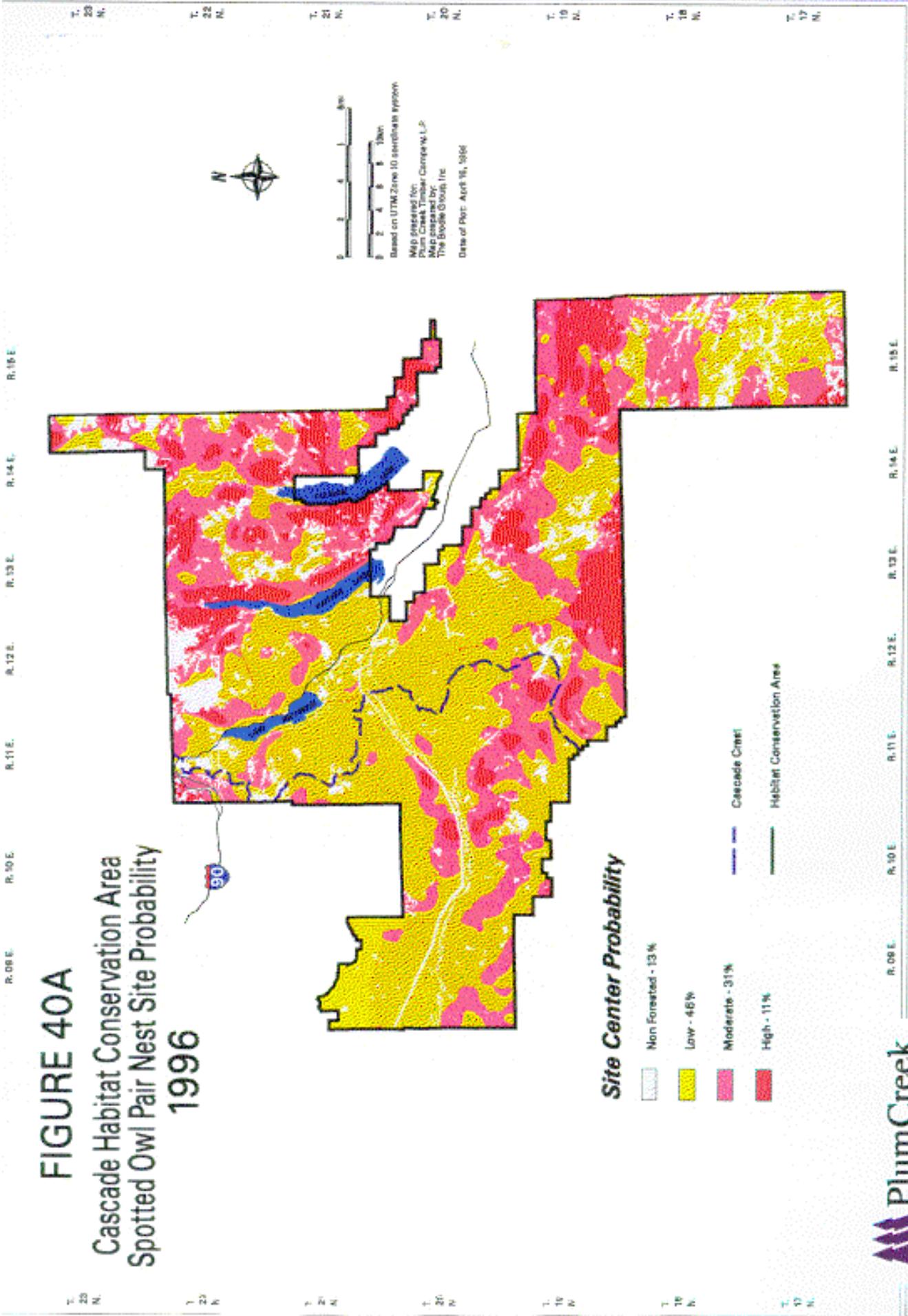


FIGURE 41A

Cascade Habitat Conservation Area Spotted Owl Pair Nest Site Probability 2016

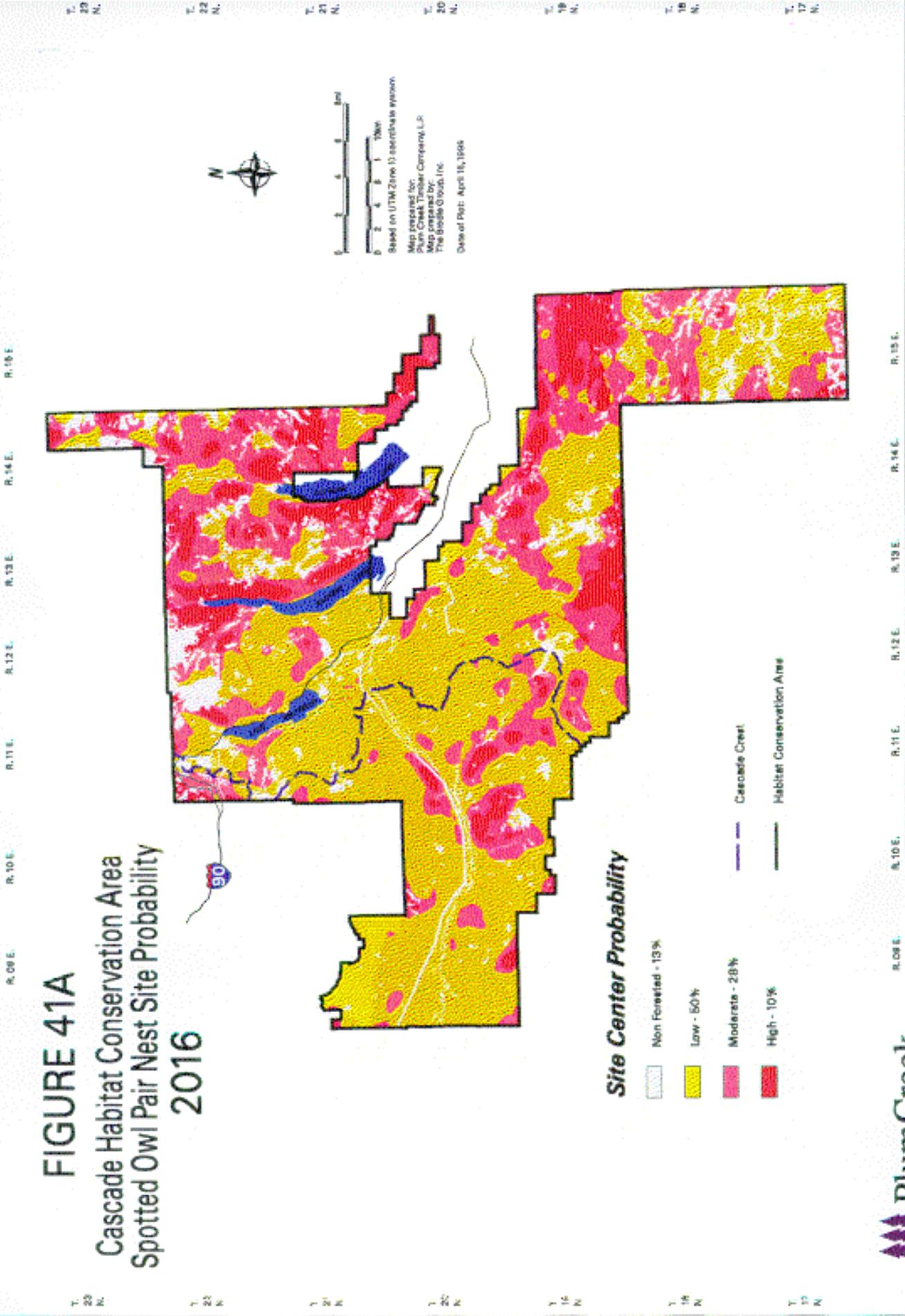
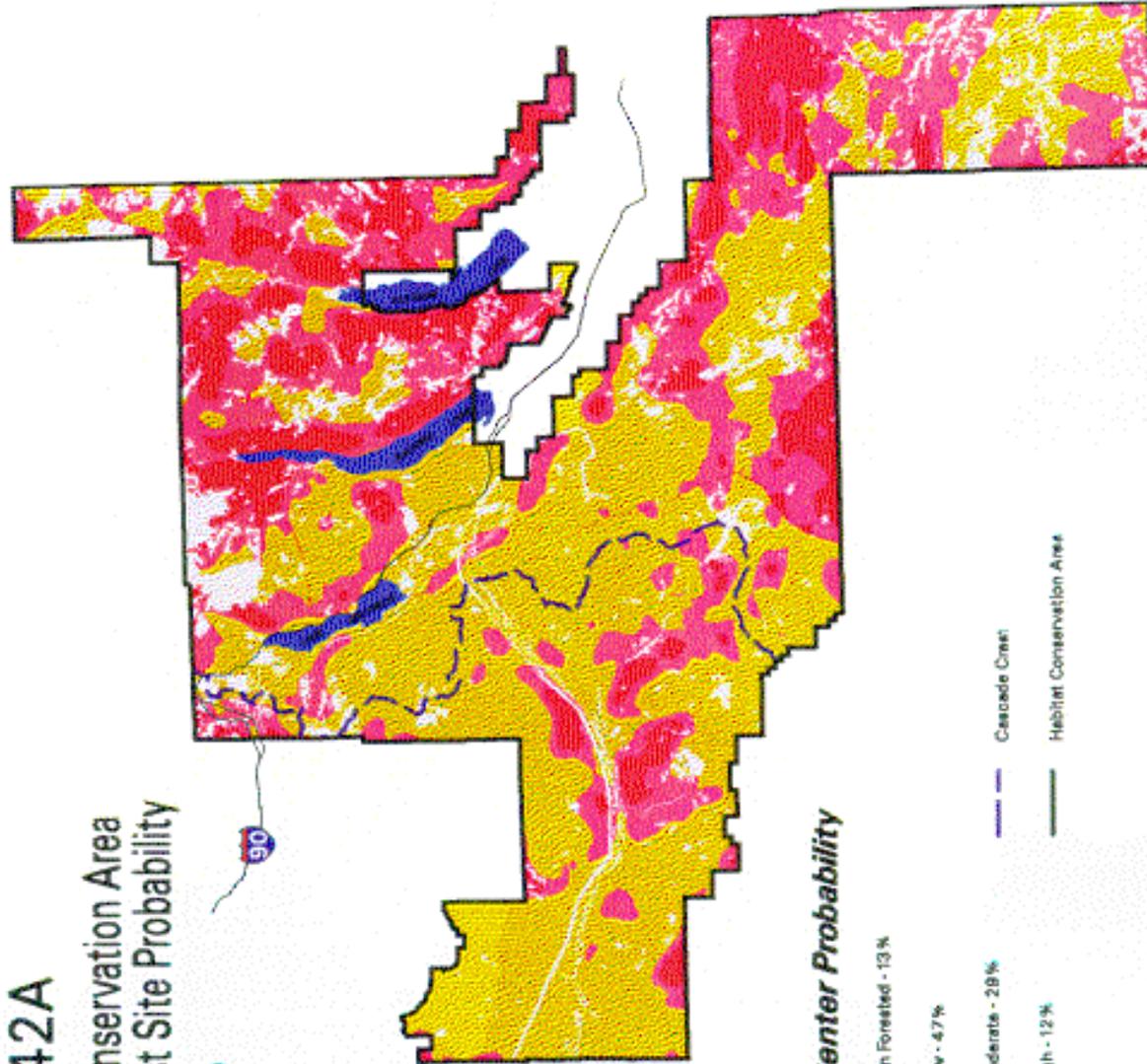


FIGURE 42A

Cascade Habitat Conservation Area Spotted Owl Pair Nest Site Probability 2045



Site Center Probability

- Non Forested - 13%
- Low - 47%
- Moderate - 28%
- High - 12%

- Cascade Creek
- Habitat Conservation Area

T. 23 N. T. 22 N. T. 21 N. T. 20 N. T. 19 N. T. 18 N. T. 17 N.



Based on UTM Zone 10 coordinate system
Map prepared for:
Plum Creek Timber Company, L.P.
Map prepared by:
The Globe Group, Inc.
Date of Plot: April 8, 2006

R. 09 E. R. 10 E. R. 11 E. R. 12 E. R. 13 E. R. 14 E. R. 15 E.

R. 09 E. R. 10 E. R. 11 E. R. 12 E. R. 13 E. R. 14 E. R. 15 E.

T. 23 N. T. 22 N. T. 21 N. T. 20 N. T. 19 N. T. 18 N. T. 17 N.

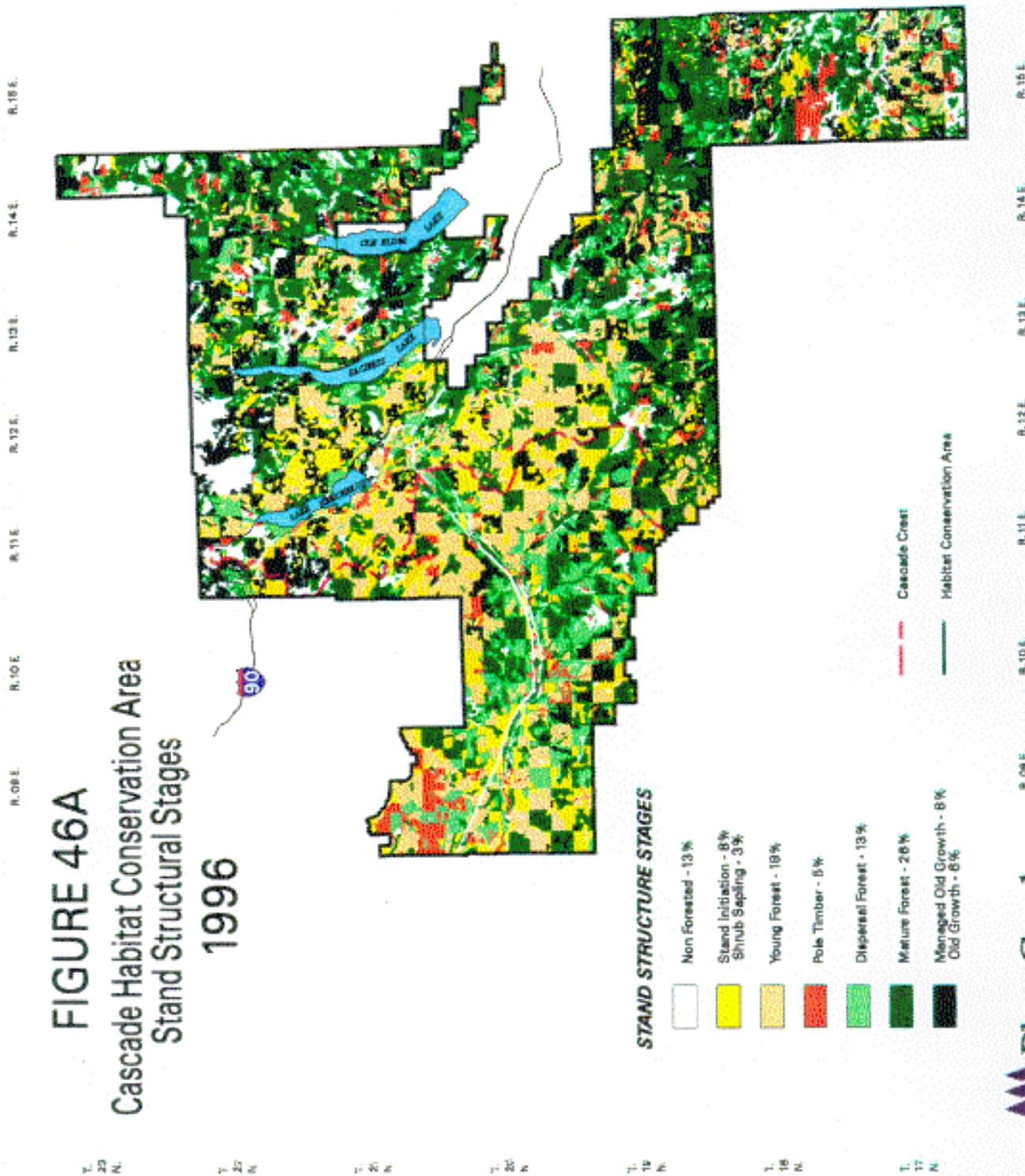


FIGURE 46A

Cascade Habitat Conservation Area

Stand Structural Stages

1996

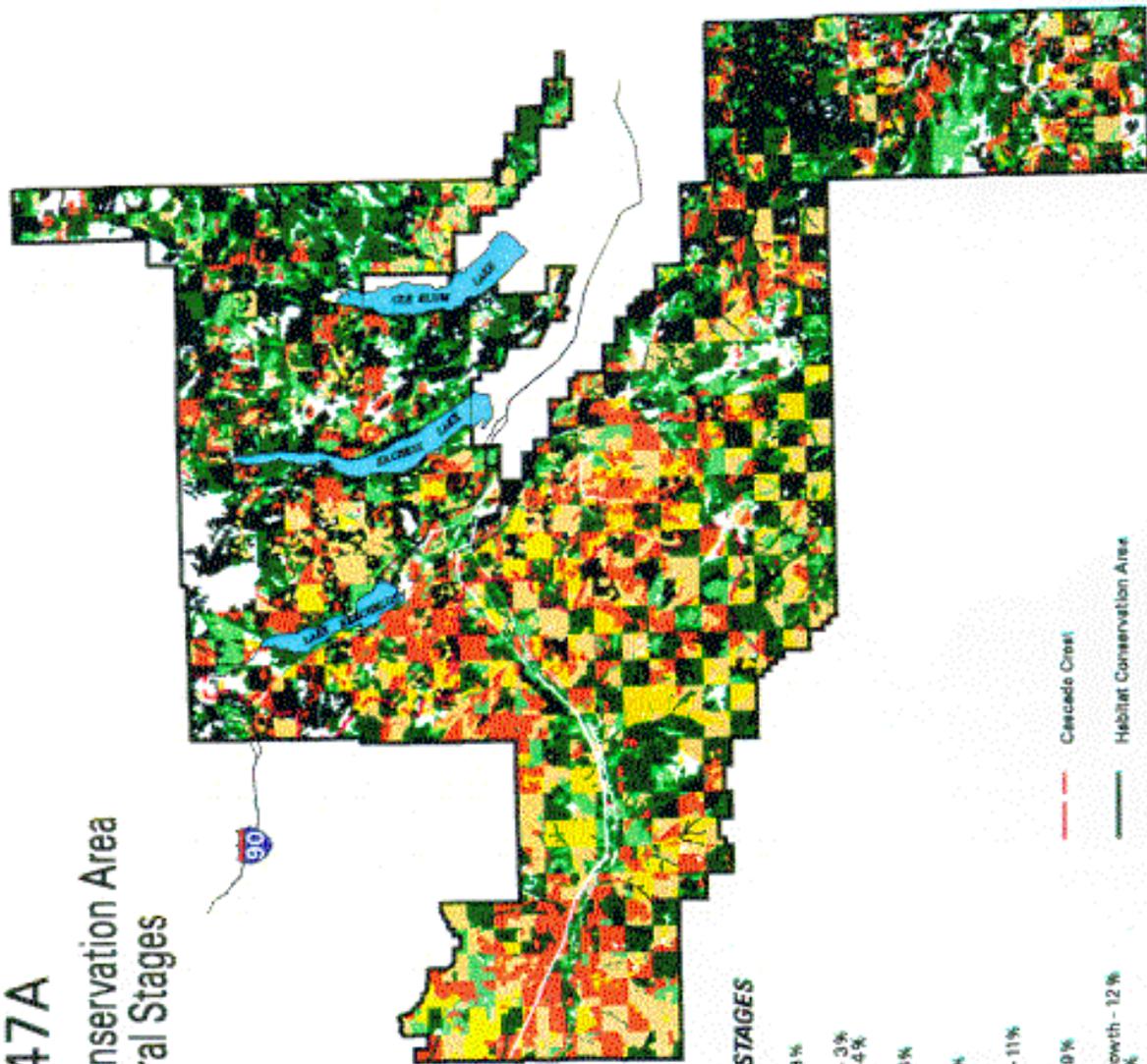


- STAND STRUCTURE STAGES**
- Non Forested - 13%
 - Stand Initiation - 8%
 - Shrub Sapling - 3%
 - Young Forest - 18%
 - Pole Timber - 5%
 - Dispersal Forest - 13%
 - Mature Forest - 26%
 - Managed Old Growth - 6%
 - Old Growth - 6%
- Legend:
- Cascade Crest
 - Habitat Conservation Area

FIGURE 47A

Cascade Habitat Conservation Area Stand Structural Stages

2016



STAND STRUCTURE STAGES

- Non Forested - 13%
- Stand Initiation - 3%
Shrub Sapling - 4%
- Young Forest - 16%
- Pole Timber - 15%
- Dispersal Forest - 11%
- Mature Forest - 19%
- Managed Old Growth - 12%
Old Growth - 7%

- Cascade Crest
- Habitat Conservation Area

T. 23 N. T. 22 N. T. 21 N. T. 20 N. T. 19 N. T. 18 N.

R. 09 E. R. 10 E. R. 11 E. R. 12 E. R. 13 E. R. 14 E. R. 15 E.

T. 23 N. T. 22 N. T. 21 N. T. 20 N. T. 19 N. T. 18 N.



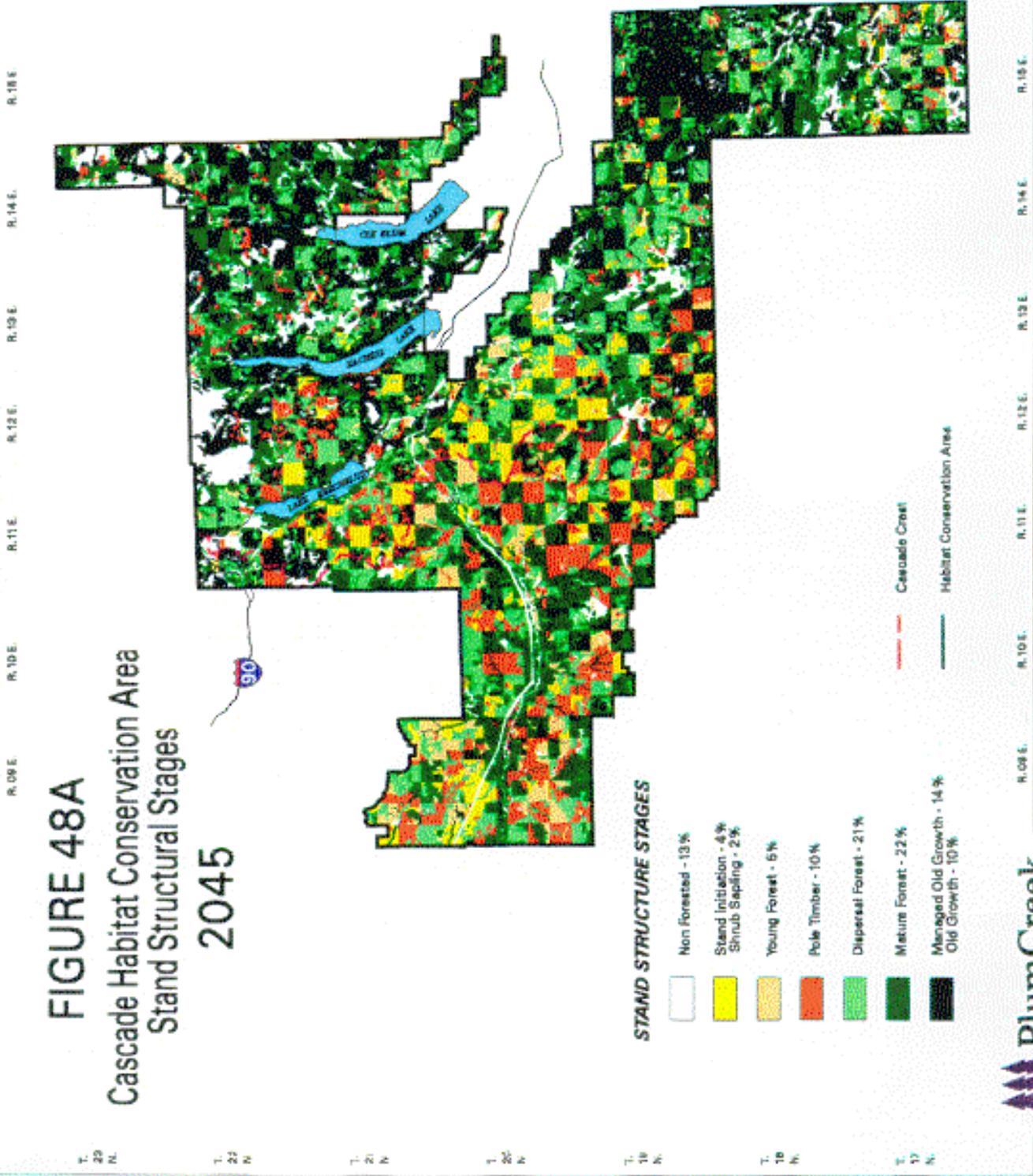
Based on UTM Zone 10 coordinate system
Map prepared for:
Plum Creek Timber Company, L.P.
Map prepared by:
The Spidle Group, Inc.
Date of Plot: April 23, 2016



FIGURE 48A

Cascade Habitat Conservation Area Stand Structural Stages

2045



***APPENDIX 1:
Modifications to
Plum Creek Timber Company's
Cascades Habitat Conservation Plan
since Issuance of the
Incidental Take Permit***



1.1 SUMMARY

MINOR MODIFICATIONS FOR THE HABITAT CONSERVATION PLAN

1. June 6, 1997. Request by the U.S Fish and Wildlife Service for modification to seasonal protections for spotted owls and northern goshawks, site management plans for bald eagles, and clarification of measures for talus slopes (Approved June 25, 1997).
2. June 29, 1998. Request by Plum Creek for modification to clarify inclusion of Plum Creek timber harvest rights on 1,400 acres already included City of Tacoma lands. (Approved February 5, 1999).
3. October 23, 1998. Request by Plum Creek for modification of land base as a result of the I-90 Land Exchange (In process).
4. November 2, 1998. Request by Plum Creek for modification to the timing of aquatic monitoring and watershed analysis schedule (Approved November 16, 1998).
5. January 15, 1999. Request by Plum Creek for modification to the reporting timeframe changing the submission of the first report to no later than December 31, 1999 (Approved February 17, 1999).

AMENDMENT TO THE INCIDENTAL TAKE PERMIT FOR BULL TROUT

1.2 MINOR MODIFICATIONS FOR THE HABITAT CONSERVATION PLAN

1.2.1 MODIFICATIONS TO PLUM CREEK'S HCP, PURSUANT TO SECTION 7.3.2 OF THE IMPLEMENTATION AGREEMENT GOVERNING THE HCP.

(See U.S. Fish and Wildlife Service Letter, Dated June 6, 1997).

1.2.1.1 Spotted Owl Seasonal Protection

Section 3.6.1, item (9), currently states that, Known owl sites in the Planning Area will receive protection within a 0.25-mile radius from March 1 through August 31."Section 3.2.1.1, item (11), contains the same statement.

Modified in both sections per request of the Service: Known sites with active spotted owl nests in the Planning Area will receive protection within a 0.25-mile radius from March 1 through August 31."

1.2.1.2 Goshawk Seasonal Protection

Section 3.5.2.4, Northern Goshawk, item (3), reads as follows: Seasonal Restrictions - For additional nest sites that may be found in the Planning Area during routine harvest planning and layout, harvesting would be delayed within a 0.25-mile radius from March 1 until August 31..."Section 3.6.5, item (17), states"...for additional nest sites that may be found in the Planning Area during routine harvest planning and layout, harvesting would be delayed within a 0.25-mile radius from March 1 until August 31."

Modified in both sections as per request of the Service: Known sites with active goshawk nests in the Planning Area will receive protection within a 0.25-mile radius from March 1 through August 31."

1.2.1.3 Bald Eagle

Section 3.6.5, item (18), states that Bald Eagle Management Plans - Plum Creek will develop cooperative site management plans with the Washington Department of Fish and Wildlife for bald eagle nest sites which may occur on Plum Creek's ownership during the Permit period

Modified per request of the Service: Plum Creek will develop cooperative site management plans with the Washington Department of Fish and Wildlife for bald eagle nest sites which may occur in the Planning Area and in proximity to Plum Creek's ownership during the Permit period.

1.2.1.4 Talus Slopes

Section 3.4.2 currently states: "...On talus slopes greater than 1.0 acres in size, Plum Creek will avoid road construction and rock extraction, where possible..."

Modified per request of the Service: "...On talus slopes greater than 1.0 acre in size, Plum Creek will avoid road construction and rock extraction, where possible. Where existing operations exist, the Service will be consulted prior to expansion of such operation..."

1.2.2 MODIFICATION TO CLARIFY THE INCLUSION OF LANDS WITH HARVEST RIGHTS FROM THE CITY OF TACOMA

When preparing the legal descriptions of covered lands incomplete legal descriptions were included for City of Tacoma lands on which Plum Creek has timber cutting rights. These lands were included in all the analysis related to the HCP and were intended to be included. The modification corrects these legal descriptions. See Plum Creek letter dated June 29, 1998.

1.2.3 MODIFICATION OF THE HCP TO REFLECT THE OWNERSHIP RESULTING FROM THE I-90 LAND EXCHANGE

See Plum Creek letter dated October 23, 1998.

1.2.4 CHANGES IN TIMING OF MONITORING AND WATERSHED ANALYSIS SCHEDULE (HCP SECTIONS 3 AND 5)

Plum Creek requested and the Services approved changes in the schedules for aquatic resources monitoring and watershed analysis (see Plum Creek letter dated November 2, 1998). The changes are:

1.2.4.1 Aquatic Resources Monitoring (HCP Section 5.1.6)

Objective 1, Method 1 provides for stream reach monitoring every 2 years for the first 10 years and then every 5 years thereafter. *Change to monitor in years 3, 5, 7, 9, 11, and 15 and then every 5 years thereafter.*

Objective 3 provides for fish population surveys during years 1, 2, 3, 4, 6, 8, 10 and then every 10 years thereafter. *Delete years 1 and 2; add years 5 and 7.*

Objective 4 provides for aquatic insect samples in years 1, 2, 3, 4, 6, 8, 10, and then every 10 years thereafter. *Delete year 1; add year 5.*

These changes are necessitated by delays in implementation caused by the company's interest in improving the monitoring program and by uncertainty about land ownership. Specifically:

1. The Washington State effectiveness monitoring program, developed cooperatively under the auspices of Timber, Fish and Wildlife (TFW), was completed in 1998. The information available from this effort will allow HCP monitoring to be coordinated with statewide effectiveness monitoring and research efforts.
2. A concerted effort has been made to complete 13 Watershed Analyses by the end of the first 2 years. It was felt this information combined with the TFW effort would further enhance the effectiveness of the HCP monitoring.
3. Much of the aquatic monitoring will involve measurement before and after timber harvest in Riparian Habitat Areas (RHAs). Suitable RHAs have taken longer than anticipated to identify due to uncertainty about the land base.

1.2.4.2 Changes to Watershed Analysis (HCP Sections 3.3.2, 3.3.5, and 3.6.7)

Plum Creek committed to complete watershed analyses on 20 Watershed Analysis Units (WAUs) within the first 5 years of the HCP. after the initial analysis the WAUs are to be re-examined every 5 years for the first 10 years and every 10 years thereafter. *Change the 5 year commitment for completion of the analyses to 10 years. Re-examination at 5 and 10 year intervals remain the same.*

The reasons for extending the time to complete the WAU analyses are as follows:

1. **Tribal Staff Limitations.** Subsequent to the implementation of the HCP and with the accelerated WAUs discussed above, discussions with the Services and tribal staff members disclosed a concern by the tribes that they have limited resources to meet the time lines for Plum Creek analyses and participate in watershed related activities with other companies and organizations. All parties agreed it might be appropriate to slow down to ensure tribal participation in the process.
2. **I-90 Land Exchange.** The number of watershed analyses within the Planning Area which can be initiated by Plum Creek remains at 20 but the mix of the WAUs changes with 3 dropping out and 3 being added. To date, 13 of the original 20 analyses have been completed but 1 of the completed analyses drops out due to ownership changes leaving 12 completed and 8 to be completed. The last 8 will be completed at a rate of at least 1 per year with the understanding that the analyses schedule will be coordinated with tribal staff members.

1.2.5 MODIFICATION TO CHANGE REPORTING TIMEFRAME FOR FIRST REPORT TO "NO LATER THAN DECEMBER 31, 1999."

See Plum Creek letter dated January 15, 1999.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

North Pacific Coast Ecoregion
Office of the Assistant Regional Director
510 Desmond Drive S.E., Suite 101
Lacey, Washington 98503-1273

June 6, 1997

William R. Brown, Vice President
Resource Management
Plum Creek Timber Company, L.P.
999 Third Avenue, Suite 2300
Seattle, Washington 98104

Dear Mr. Brown:

Pursuant to section 7.3.2 of the Implementation Agreement governing the Cascades Habitat Conservation Plan (HCP), I am proposing four minor amendments be made to the HCP. Although these minor amendments become final upon 60 days in the absence of a response, I would appreciate a response from you indicating your concurrence with these changes. I believe these changes are merely interpretative, and rather than change the meaning of the plan, they clarify and change the text to better reflect the agreed to plan.

1. Spotted Owl Seasonal Protection

Current Provision: Section 3.6.1, Item (9), states that "Known owl sites in the Planning Area will receive protection within a 0.25-mile radius from March 1 through August 31." Section 3.2.1.1, Item (11), contains the same statement.

Modified Provision: We recommend modifying the text in both sections to read as follows: "Known sites with active spotted owl nests in the Planning Area will receive protection within a 0.25-mile radius from March 1 through August 31."

Rationale: Only those sites with active nests, or evidence of recent occupancy in conjunction with uncertainty about whether a nest is present or not, would receive seasonal protection. The intent of seasonal restrictions is to protect eggs and young birds in the nest by avoiding disturbances that might cause nest abandonment and other causes of nest failure. This change will remove a hindrance to operations in areas where the old provision was providing no benefit to the species. Vacant nest sites do not benefit from seasonal restrictions.

Effect on Species: This change will have no effect on spotted owls. Where known active nests occur, they will receive protection.

William R. Brown, Vice President
June 6, 1997
Page 2

Conclusion: Because the change will have no effect on spotted owls and will not alter the amounts or distribution of habitats or mitigation for any species, this change is considered to be a minor change with little or no effect on the resource. It merely reflects the intent of the negotiations and corrects a drafting error.

2. Goshawk Seasonal Protection

Current Provision: Section 3.5.2.4, *Northern Goshawk*, Item (3), reads as follows: "**Seasonal Restrictions** - For additional nest sites that may be found in the Planning Area during routine harvest planning and layout, harvesting would be delayed within a 0.25-mile radius from March 1 until August 31....." Section 3.6.5, Item (17), states "...For additional nest sites that may be found in the Planning Area during routine harvest planning and layout, harvesting would be delayed within a 0.25-mile radius from March 1 until August 31."

Modified Provision: We recommend modifying the text in both sections as follows: "Known sites with active goshawk nests in the Planning Area will receive protection within a 0.25-mile radius from March 1 through August 31."

Rationale: As written, there are a number of caveats on which nests would be protected -- only those on Plum Creek lands which are not currently known but may be found during sale layout. The Fish and Wildlife (Service) has not imposed a requirement for Plum Creek to conduct goshawk surveys. However, the Service believes that every active goshawk nest could benefit from this type of restriction regardless of the ownership of the nest site, whether it is currently known, or how it may be discovered in the future. The above amendment would be consistent with the similar provisions for spotted owls.

Effect on Species: The effect of this change on goshawks would be positive. Existing sites would also receive protection as would future sites discovered during monitoring or other activities.

Conclusion: The effects of this change are negligible with the exception of some positive benefits to goshawks.

3. Bald Eagles

Current Provision: Section 3.6.5, Item (18), states that "**Bald Eagle Management Plans** -Plum Creek will develop cooperative site management plans with the WDFW for bald eagle nest sites which may occur on Plum Creek's ownership during the Permit period."

William R. Brown, Vice President
June 6, 1997
Page 3

Modified Provision: We recommend amending the text as follows: "Plum Creek will develop cooperative site management plans with the WDFW for bald eagle nest sites which may occur in the Planning Area and in proximity to Plum Creek's ownership during the Permit period."

Rationale: As an example, the only currently known nest site in the Planning Area occurs on National Forest lands but in close proximity to Plum Creek lands. Activities on Plum Creek lands may affect eagle nests on adjacent properties unless this change is made. This change would make this provision for eagles consistent with the similar provision for peregrine falcons. This change would make this section consistent with sections 3.5.2.4 (Bald Eagles).

Effect on Species: This change would have positive effects on eagles by protecting them from disturbance and other effects of activities on nearby Plum Creek lands.

Conclusion: The effects of this change are negligible with the exception of some positive benefits to eagles.

4. Talus Slopes

Current Provision: Section 3.4.2 currently states that "...On talus slopes greater than 1.0 acre in size, Plum Creek will avoid road construction and rock extraction, where possible..."

Modified Provision: We recommend the text be amended to read as follows: "...On talus slopes greater than 1.0 acre in size, Plum Creek will avoid road construction and rock extraction, where possible. Where existing operations exist, the Service will be consulted prior to expansion of such operations....."

Rationale: The text regarding "avoidance where possible" could be interpreted as precluding expansion in talus slopes greater than 1.0 acre. The Service believes that, in some cases, expansion may be preferable to initiating a new site on a smaller talus slope. Larger talus slopes are more likely to be further from the timbered and possible shaded edges of such talus. The Service would provide and seek technical assistance in these situations to resolve these matters in a manner that is least disruptive to operations while achieving the conservation goals.

Effect on Species: This change would provide the applicant and Service additional flexibility in locating rock-extraction operations. There might be some additional impact to species utilizing larger talus fields, but expansion of existing operations in a talus field would likely have few additional effects beyond those already occurring. However, expansion may preclude the need to access additional talus slopes thereby reducing the effects to talus-dependant species.

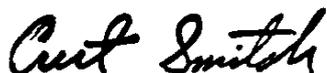
William R. Brown, Vice President
June 6, 1997
Page 4

Conclusion: The Service believes this is a minor change which merely provides the parties flexibility to operate in a manner which further minimizes impacts to both operations and the wildlife resources.

Please notify me as to whether you concur or do not concur with these changes or if you have other related or unrelated changes to propose. We are aware that there are several outstanding issues regarding riparian-related components of the plan. My staff, in conjunction with staff from the National Marine Fisheries Service, will continue to work toward resolution of these riparian issues.

Thank you for your attention in this matter.

Sincerely,



Curt Smitch,
Assistant Regional Director

CS:wv:jkp

cc: FWS - JEngbring, TBodurtha
RO - MSpear, DMackey,
DOI-SOL - DHoobler
PCT - ~~M~~Collins, LHicks
NMFS - SLandino
WDFW - DWhipple, TQuinn
WDNP - JEdwards, ATasker
FWS/PNW-HCP:WOVogel:wov:(360) 534-9330:10/03/96:MINORAMD.PCT
revised:wov:06/05/97

June 29, 1998

Regional Director
U. S. Fish & Wildlife Service
911 N.E. 11th Avenue
Portland, OR 97232-4181

Regional Director
National Marine Fisheries Service
7600 Sand Point Way, N.E.
Seattle, WA 98115-0070

Gentlemen,

It was recently brought to our attention that an oversight exists in the covered lands as identified by legal description in Appendix 1 of the Plum Creek Cascades Habitat Conservation Plan (HCP). In 1987 Plum Creek deeded six parcels of land to the City of Tacoma (pages 1 & 2 of Attachment 1) but retained the right to harvest the timber for 20 years (page 3 of Attachment 1). The six parcels are in six sections which also contain timberlands owned by Plum Creek. The HCP included the City of Tacoma lands since Plum Creek would have control over the harvest and it would be inconsistent to harvest parcels in the same section to different standards. Upon completion of harvest the lands convert to City of Tacoma for future forest management activities. The standards in Tacoma's Green River Watershed Forest Land Management Plan of July 1, 1996, exceed those in the HCP.

In Appendix 1 of the HCP the legal descriptions were correct for four of the six sections containing City of Tacoma parcels. Attachment 2 compares legal descriptions for the six sections in Appendix 1 with the legal description of Plum Creek and City of Tacoma parcels in the sections. Sections 17 and 21 of Township 20N, Range 11E, inadvertently did not include the combined legal description for both ownerships.

Section 7.3.2 of the IA states that minor modifications to the HCP can be proposed by Plum Creek or the Services with written notice provided such notice describes the change and demonstrates the effect on any Plan or Permit species or habitat types and the basis for the conclusion that the change is minor. The proposed change is to modify the legal descriptions in Appendix 1 for Sections 17 and 21 of Township 20N, Range 11E to the following:

- Section 17: Those portions of the NE1/4, N1/2SE1/4, N1/2S1/2SE1/4 lying Easterly of BNRR R/W, W1/2, S1/2S1/2SE1/4 lying Easterly of BRNC R/W, and all those portions of W1/2NE1/4, NW1/4SE1/4 and SW1/4SE1/4 lying Westerly of BRNC RR R/W except 43.1 acres deeded to Tacoma under AFN 8591300454.

Section 21: SE1/4, portions SW1/4NE1/4 and E1/2SW1/4, N1/2NE1/4, SE1/4NE1/4, W1/2SW1/4 and the Northeasterly diagonal 1/2 of the SW1/4NE1/4 and the Southwesterly diagonal 1/2 of the E1/2SW1/4 and that portion of the NW1/2 lying Northeasterly of the centerline of the US Forest Service Rd. as described in that easement to BNRC, dated 8/20/86, filed 9/16/86 under AF#8609160567.

The change has no impact on Plan or Permit species and is minor since it corrects an editing error.

Although this minor modification becomes final at the end of 60 days in the absence of a response, we would appreciate a response within 30 days so that current harvest plans on the parcels in Section 17 can proceed in a timely manner.

Sincerely,



Michael E. Collins
Director, Operations Support
Cascade Region

cc: Bill Vogel FWS
Steve Landino NMFS
Gary Johnson PCTC
Cyril Moya / Art Tasker DNR

999 Third Avenue, Suite 2300
Seattle, WA 98104-4096
(206) 467-3639
FAX (206) 467-3794

October 23, 1998

Bill Vogel
U. S. Fish & Wildlife Service
510 Desmond Drive S.E.
Suite 102
Lacey, WA 98503

Steve Landino
National Marine Fisheries Service
510 Desmond Drive S.E.
Suite 103
Lacey, WA 98503

Re: Notice of Request for Minor Modification to Central Cascades Habitat Conservation Plan

Gentlemen:

Pursuant to the terms and conditions of Plum Creek Timber Company's Central Cascade Habitat Conservation Plan (HCP) and accompanying Implementation Agreement (IA), Plum Creek hereby requests approval for a minor modification of the HCP to accommodate a proposed land exchange with the United States. Consistent with the requirements of IA Section 7.3.2(a), this notice of request for minor modification is supported by the enclosed document entitled "Description and Analysis of Modifications to Plum Creek Timber Company's Cascade Habitat Conservation Plan (HCP)". The document is in draft format to allow further technical changes before it is distributed with the Draft Environmental Impact Statement for public comment.

Plum Creek is willing to waive the 60-day limitation for agency review of requests for minor modifications. However, as you may be aware, Congress recently enacted legislation which authorizes the I-90 Land Exchange and requires that it be completed within 270 days. As a practical necessity, therefore, the decision on this requested modification must be completed within a reasonable time prior to the legislated deadline.

Attached is a suggested time line for key activities and decisions which will allow time for agency review and environmental analysis. Please telephone me at your earliest convenience to discuss questions or concerns you might have concerning the recommended time for review.

Sincerely,



Michael E. Collins
Director, Operations Management
Cascade Region

cc: Regional Director U. S. Fish & Wildlife Service
Regional Director National Marine Fisheries Service
Jim Kraft, Plum Creek Timber Company

November 2, 1998

Bill Vogel
U. S. Fish & Wildlife Service
510 Desmond Drive S.E.
Suite 102
Lacey, WA 98503

Steve Landino
National Marine Fisheries Service
510 Desmond Drive S.E.
Suite 103
Lacey, WA 98503

Re: Notice of Request for Minor Modification to Central Cascades Habitat Conservation Plan

Gentlemen:

Pursuant to the terms and conditions of Plum Creek Timber Company's Central Cascade Habitat Conservation Plan (HCP) and accompanying Implementation Agreement (IA), Plum Creek hereby requests approval for a minor modification of the HCP to accommodate changes to the monitoring and Watershed Analysis schedules in Sections 3 and 5. Since these changes only impact the timing and not the scope of the watershed assessment and monitoring program, the effectiveness of the program will not be impacted and in fact, should be enhanced for the reasons stated below.

Changes to Aquatic Resources Monitoring (Section 5.1.6)

Objective 1, Method 1 provides for stream reach monitoring every 2 years for the first 10 years and then every 5 years thereafter. Change to monitor in years 3,5,7,9,11,15 and then every 5 years thereafter.

Objective 3 provides for fish population surveys during years 1,2,3,4,6,8,10 and then every 10 years thereafter. Delete years 1 and 2; add years 5 and 7.

Objective 4 provides for aquatic insect samples in years 1,2,3,4,6,8,10, and then every 10 years thereafter. Delete year 1; add year 5.

These changes are necessitated by delays in implementation caused by the company's interest in improving the monitoring program and by uncertainty about land ownership. Specifically:

1. The Washington State effectiveness monitoring program, developed cooperatively under the auspices of Timber, Fish and Wildlife (TFW), was completed in 1998. The information available from this effort will allow HCP monitoring to be coordinated with statewide effectiveness monitoring and research efforts.

2. A concerted effort has been made to complete 13 Watershed Analyses by the end of the first 2 years. It was felt this information combined with the TFW effort would further enhance the effectiveness of the HCP monitoring.

3. Much of the aquatic monitoring will involve measurement before and after timber harvest in Riparian Habitat Areas (RHAs). Suitable RHAs have taken longer than anticipated to identify due to uncertainty about the land base.

Changes to Watershed Analysis (Sections 3.3.2, 3.3.5, and 3.6.7)

Plum Creek committed to complete watershed analyses on 20 Watershed Analysis Units (WAUs) within the first 5 years of the HCP. After the initial analysis the WAUs are to be re-examined every 5 years for the first 10 years and every 10 years thereafter.

Change the 5 year commitment for completion of the analyses to 10 years. Re-examinations at 5 and 10 year intervals remain the same.

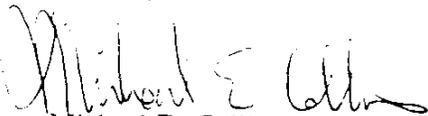
The reasons for extending the time to complete the WAU analyses are as follows:

1. Tribal Staff Limitations. Subsequent to the implementation of the HCP and with the accelerated WAUs discussed above, discussions with the Services and tribal staff members disclosed a concern by the tribes that they have limited resources to meet the time lines for Plum Creek analyses and participate in watershed related activities with other companies and organizations. All parties agreed it might be appropriate to slow down to ensure tribal participation in the process.

2. I-90 Land Exchange. The number of watershed analyses within the Planning Area which can be initiated by Plum Creek remains at 20 but the mix of the WAUs changes with 3 dropping out and 3 being added. To date 13 of the original 20 analyses have been completed but 1 of the completed analyses drops out due to ownership changes leaving 12 completed and 8 to be completed. The last 8 will be completed at a rate of at least 1 per year with the understanding that the analyses schedule will be coordinated with tribal staff members.

Even though minor modifications become final upon 60 days in the absence of a response, I would appreciate a response as soon as possible indicating your concurrence with these changes. Please call me if you have any questions.

Sincerely,



Michael E. Collins
Director, Operations Management
Cascade Region

cc: Regional Director U. S. Fish & Wildlife Service
Regional Director National Marine Fisheries Service
Jim Kraft, Plum Creek Timber Company



999 Third Avenue, Suite 2300
Seattle, WA 98104-4096
(206) 467-3639
FAX (206) 467-3794

January 15, 1999

Bill Vogel
U. S. Fish & Wildlife Service
510 Desmond Drive S.E.
Suite 102
Lacey, WA 98503

Steve Landino
National Marine Fisheries Service
510 Desmond Drive S.E.
Suite 103
Lacey, WA 98503

Re: Notice of Request for Minor Modification to Central Cascades Habitat Conservation Plan

Gentlemen:

Pursuant to the terms and conditions of Plum Creek Timber Company's Central Cascade Habitat Conservation Plan (HCP) and accompanying Implementation Agreement (IA), Plum Creek hereby requests approval for a minor modification of the HCP to accommodate a change to the monitoring schedule in Section 5. Since this change only impacts the timing and not the scope of monitoring program, the effectiveness of the program will not be impacted.

The reporting schedule for the HCP is shown in Table 31 and described in Section 5.1.8. Reports are to be submitted to the Services within 180 days at the end of HCP calendar years 2, 5, 10, 20, 30, 40, and 50 with the first report to be submitted to the Services no later than 180 days after December 31, 1998. **This modification would change the submission of the first report to "no later than December 31, 1999".**

The primary reason for the change is the I-90 Land Exchange and the resultant change of monitoring locations and timing as requested in my letter dated November 2, 1998, and agreed to in the Services letter dated November 16, 1998. With this modification to the monitoring schedule, reports will be more meaningful when they are submitted and reviewed after the completion of at least one field season which is expected to be at the end September. Additionally, the land exchange and the subsequent modification of the HCP are to be completed mid-June and the resultant ownership pattern would not be accurately reflected in reports prepared within the 180 day deadline.

Even though minor modifications become final upon 60 days in the absence of a response, I would appreciate a response as soon as possible indicating your concurrence with this change. Please call me if you have any questions.

Sincerely,

A handwritten signature in black ink that reads 'Michael E. Collins'.

Michael E. Collins
Director, Operations Management
Cascade Region

cc: Regional Director U. S. Fish & Wildlife Service
Regional Director National Marine Fisheries Service
Jim Kraft, Plum Creek Timber Company



1.3 AMENDMENT OF THE INCIDENTAL TAKE PERMIT TO INCLUDE BULL TROUT AS A COVERED SPECIES ON LANDS ADMINISTERED BY PLUM CREEK UNDER ITS HCP.

1.3.1 SUMMARY

The Service has authorized Plum Creek to add the bull trout to the list of Section 10(a) species under its Incidental Take Permit, and to incidentally take bull trout in the course of otherwise lawful forest management and associated land use activities within the HCP Planning Area.

1.3.2 BACKGROUND

On June 13, 1997, the Columbia River population segment of bull trout was proposed for listing as threatened (62 FR 32268-32284. The comment period for the proposed rule was extended for 65 days on August 5, 1997(62 FR 42092) and a ruling was expected on June 13, 1998.

On September 11, 1997, Plum Creek sent a letter to the Service (see attached letter) requesting that the bull trout (*Salvelinus confluentus*) be added to the Plum Creek's Incidental Take Permit. On May 4, 1998 (63 FR 24565), the Service published a notice of intent to amend Plum Creek's permit. The purpose of the notice was to seek public comment on the Service's proposal to add bull trout to Plum Creek's permit. To determine whether adding bull trout to Plum Creek's permit would appreciably reduce the likelihood of the survival and recovery of bull trout or any other species, the Service reinitiated consultation under Section 7 of the Endangered Species Act on May 30, 1998. On June 10, 1998, the Service announced the listing of the Columbia River and Klamath distinct population segments of bull trout as threatened, followed by publication of a final rule (63 FR 31647) with an effective date of July 10, 1998. By notice of a letter dated July 14, 1998 (see attached letter), the Service determined that this amendment was appropriate and consistent with the Implementation Agreement signed on June 27, 1996, with regard to the Habitat Conservation Plan accompanying Plum Creek's Incidental Take Permit. By notice of the Service's letter, Plum Creek's Incidental Take Permit is amended to read:

*The permittee, its officers, employees, agents, and contractors are authorized to incidentally take all northern spotted owls (*Strix occidentalis caurina*), marbled murrelets (*Brachyramphus marmoratus marmoratus*), grizzly bears (*Ursus arctos* = *U. a. horribilis*), gray wolves (*Canis lupus*), and the Columbia River Basin distinct population segment of the bull trout (*Salvelinus confluentus*) in the course of otherwise lawful forest management and incidental land use activities, as described in the permittee's application and supporting documents, and as conditioned herein.*

On May 30, 1998, the Service reinitiated its Biological Opinion on amendment of the Section 10(a)(1)(B) Incidental Take Permit previously issued to Plum Creek, based upon the HCP and Implementation Agreement in accordance with Section 7(a)(2) of the Endangered Species Act of 1973 (16 U.S.C. 1536 et seq.). This document is incorporated by reference.

The Service reinitiated the Biological Opinion to address the effects of adding the Columbia River distinct population of bull trout to Plum Creek's Incidental Take Permit. The Service also considered whether or not the proposed action of adding the bull trout to the permit would likely adversely affect the northern spotted owl, marbled murrelet, grizzly bear, gray wolf, and peregrine falcon (*Falco peregrinus*). On July 13, 1998,

the Service concluded that adding the bull trout to Plum Creek's Incidental Take Permit would not adversely affect any of these species.

The reinitiation of the Biological Opinion by the Service was based on the information contained in the June 24, 1996, Biological Opinion, information accumulated and analyzed during the listing process, and other information as appropriate. Reinitiation of the Biological Opinion also relied upon portions of the documents associated with the original application package for the Incidental Take Permit, especially HCP Sections: 2.10.5.2 Bull Trout; 2.11 Fisheries Limiting Factor Analysis; 2.13 Fish Resources in the Yakima River Subbasin, 2.13.4 Bull Trout; 3.2.2.1 Lifeform 1; 3.3 Riparian Management Strategy; 3.4.1 Wetlands; 3.5.2.3 Fish; 3.5.3.1 Lifeform 1; 3.6 Mitigation Measures and Measurable Criteria for Determining Biological Success; 5.1 Monitoring; 5.1.6 Aquatic Resources Monitoring; 5.4 Adaptive Management; and 5.4.3.3 Riparian Management Strategy; especially EIS Sections: 3.5 Water Quality and Quantity; 3.8 Fish and Fish habitat; 4.6 Surface Water; 4.9 Fish and Fish Habitat; 4.14.7 Fisheries--Cumulative Impacts; and technical papers produced in support of the HCP which form the foundation for the science and its application including Lundquist et al. (1995) which addressed Bull Trout Range, Occurrence in the Plan Area, Habitat Requirements, Management Considerations, HCP management Approach, and Habitat Analysis and Potential Effects of the HCP; Watson and Toth (1995) which analyzed limiting factors for salmonids; and Toth et al. (1995) which described Plum Creek's fish conservation strategy.



999 Third Avenue, Suite 2300
Seattle, WA 98104-4096
(206) 467-3639
FAX (206) 467-3794

September 11, 1997

Michael J. Spear
Regional Director
U.S. Fish and Wildlife Service
911 N.E. 11th Avenue
Portland, OR 97232-4181

Re: Amendment to PRT-808398 dated 6/27/96

Dear Mr. Spear,

On June 13, 1997, the U.S. Fish and Wildlife Service announced in the Federal Register (copy of summary attached) a proposed rule for the listing of bull trout. It is understood that action will be taken on the rule one year from the date of the Federal Register notice.

Section 7.1.2(b)(3) of the Implementation Agreement for the Plum Creek HCP states:

If Plum Creek provides notice of its desire for a Permit amendment at least 195 days prior to the end of the one year period ..., the Service will make a final decision on the Permit amendment concurrent with the publication of the final listing regulation.

This letter constitutes notice that Plum Creek desires bull trout be added to the Permit by amendment.

Sincerely,

A handwritten signature in cursive script that reads 'Michael E. Collins'.

Michael E. Collins

cc: Steve Landino, National Marine Fisheries Service, Olympia, WA
Bill Vogel, U.S. Fish and Wildlife Service, Olympia, WA
Bill Brown, Plum Creek Timber Company, L.P., Seattle, WA
Jim Kraft, Plum Creek Timber Company, L.P., Seattle, WA



United States Department of the Interior

FISH AND WILDLIFE SERVICE

911 NE. 11th Avenue
Portland, Oregon 97232-4181

IN REPLY REFER TO:

JUL 14 1998

Michael E. Collins, Director, Operations Support
Plum Creek Timber Company, L.P.
Cascade Region
999 Third Avenue, Suite 2300
Seattle, Washington 98104-4096

Dear Mr. Collins:

In response to your September 11, 1997, letter requesting that the bull trout be added to your Endangered Species Act incidental take permit PRT-808398, the Fish and Wildlife Service has determined that this amendment is appropriate.

By notice of this letter, paragraph 11.G. of permit PRT-808398 is amended to read:

The permittee, its officers, employees, agents, and contractors are authorized to incidentally take all northern spotted owls (*Strix occidentalis caurina*), marbled murrelets (*Brachyramphus marmoratus marmoratus*), grizzly bears (*Ursus arctos = U.a. horribilis*), gray wolves (*Canis lupus*), and the Columbia River Basin distinct population segment of the bull trout (*Salvelinus confluentus*) in the course of otherwise lawful forest management and incidental land use activities, as described in the permittee's application and supporting documents, and as conditioned herein.

Paragraph 11.H. is also amended to read:

The permittee will notify the Service if locations of nesting murrelets not described in the HCP are discovered, if additional owl site centers not described in the HCP are discovered, if additional stream reaches are found to contain the bull trout, or if any observations of wolves or grizzly bears are made within the HCP Planning Area during the course of the HCP.

Please attach this letter to your permit. If you have any questions, please contact Dave Wesley, Assistant Regional Director, at (503) 231-6159.

Sincerely,

Regional Director
Acting



APPENDIX 2: Baseline Analysis



2.1 BASELINE ANALYSIS

Plum Creek and the Services realized that all circumstances that might arise in the future, and that might affect the HCP, could not be anticipated. However, Plum Creek and the Services did anticipate and provided guidance for certain circumstances that may warrant flexibility and administration as minor amendments to the HCP. Section 5.3.5, "Amendments and Flexibility," of the HCP anticipated that analyses made for the HCP may change, from time to time, due to several factors related to process:

"... Another example [of circumstances that may warrant flexibility and administration as minor amendments] might be minor modification or alteration of stand structure/Lifeform habitat projections that are based on the results of monitoring over time or new information from the increasing body of scientific literature. The data and models used to prepare the HCP will be updated from time to time to increase the accuracy and amount of information available. In addition, management units developed for the analysis may be restructured to better reflect operational constraints. More accurate information on forest stand structures will improve Plum Creek's ability to evaluate the availability of habitat for the various Lifeforms. Projections of stand structures and lifeform habitat could be impacted during the Permit period, with no discernible physical change to the landscape or harm to the species. The stand structure classifications used in the HCP will be projected annually as new information becomes available."

Since the inception of the HCP in June 1996, circumstances anticipated in Section 5.3.5 of the HCP have occurred which have warranted flexibility and administration of minor amendments. Those related to the Baseline Analysis are summarized below.

2.2 REPLACEMENT OF FIBRPLAN WITH OPTIONS FOREST ESTATE PLANNING MODEL

FIBRPLAN is a forest estate planning model that was used in the HCP to simulate activities on Plum Creek's forest landbase. FIBRPLAN operates in an MS/DOS environment. Specific forest inventory information used in FIBRPLAN was generated from Plum Creek's inventory system (described in Section 2.6.1; HCP) for each management unit. FIBRPLAN was replaced by the OPTIONS forest estate planning model to simulate activities on Plum Creek's forest landbase in 1998. OPTIONS is a Windows-based model that allows Plum Creek to enhance the information that was generated on Plum Creek's landbase using FIBRPLAN.

The following description of OPTIONS replaces Section 2.7 of the HCP:

OPTIONS is a Windows-based, forest estate simulation planning model with the capabilities of simulating growth, silvicultural activities, ecological constraints, and harvesting for large, complex forest landbases. By using OPTIONS, multiple combinations of forest-management and silvicultural applications (e.g., harvesting, planting, fertilization, and thinning) can be evaluated across the Planning Area and over any given time period for up to 999 years.

OPTIONS requires specific forest inventory information as well as growth and yield data in order to project changes that will occur over time in a forest as a result of various harvest levels and silvicultural applications. Specific forest inventory information used in OPTIONS is generated from Plum Creek's Inventory System described above for each forest inventory polygon. Inventory data obtained for other

ownership's (i.e., Forest Service) in the Planning Area and used in OPTIONS is described in Oliver et al. (1995). OPTIONS uses inventory data to profile current forest landscapes in the Planning Area and to establish a basis for predicting the characteristics of future stands. The growth model, Stand Projection System (SPS), is used to create the growth and yield tables that OPTIONS uses to predict future stand characteristics. The growth and yield curves used by OPTIONS depict how a particular stand will grow and develop over time. OPTIONS uses yield tables for each defined tree species group and site index, allowing different tree species in different growing conditions to develop independently. The species and site-specific growth curves are then linked with current inventory stand data and exported into OPTIONS to profile forest landscapes in the Planning Area.

The landbase data, used in OPTIONS, is comprised of the forest inventory polygons described in Section 2.6.2 of the HCP. During the course of the simulation, each forest inventory polygon is updated yearly for growth, silvicultural treatments, insect infestations, diseases, blowdown, and other forest-related factors, according to user-defined rules. As each forest inventory polygon reaches the minimum age or criteria for thinning or harvesting, it is automatically placed into a harvest queue. After all records are updated, stands in the harvest queue are harvested according to a harvest schedule based on species and wood type priority, subject to availability due to ecological and habitat considerations. Wood types are defined as thinnings, second growth, and mature stands.

The model provides for accurate planning and is easily adapted when external factors such as forest health or market conditions necessitate changes in management plans. Consideration of other forest resources such as watersheds or wildlife may also necessitate altering timber management goals (e.g., harvest schedule, rotation length, and/or silvicultural treatment levels).

In addition to commercial thinning and even-aged timber harvesting, various types of selective harvesting can also be defined for each simulation run. In all simulation runs, selective harvests are treated as special types of thinning which can only be performed on forest inventory polygons that have either reached or exceeded the defined rotation age.

All common silvicultural treatments are available for inclusion in an OPTIONS scenario. For simplicity, all potential treatment methods are grouped into five general treatment types: (1) Regeneration; (2) Pre-commercial thinning (PCT); (3) Fertilization; (4) Commercial thinning; and (5) Genetics. Each individual treatment definition includes treatment specifications for each species group and site class. Thus, complex silvicultural and management regimes can be devised by using combinations of different treatments.

OPTIONS runs can be specified for any length of time up to 999 years. While running, the model produces "files" which are updated continuously, allowing reports and graphs to be produced on an annual basis.

Under the processing rules established for OPTIONS, the user can (1) specify yield tables for each management regime and for each model run, (2) specify threshold values (i.e., minimum recoverable commercial volumes) for commercial thinning and selection harvests, and (3) specify ecological rules/constraints that will be included in each scenario.

Ecological constraints can be complex under OPTIONS. For example, up to 25 categories of ecological constraints can be included within a single scenario. Constraints can be applied to individual stands, partial stands, or to many stands depending upon the type of constraint and its application. Rules of application can be applied to each constraint category, and its subsequent resultant effects on each individual treatment stand or neighboring stands can be evaluated. In addition, each constraint category can be specified with

single- and multi-year disturbance rules. This capacity enables the model to effectively address issues at stand levels, watershed levels, and at landscape unit levels; while addressing effects on biodiversity and visual-quality objectives.

OPTIONS tracks all activities which occur on each individual forest inventory polygon. These activities are linked to a GIS data base for visual display and further analysis. Management activities on each management unit can be controlled by a variety of factors including economic limitations, budget constraints, and ecological constraints.

A habitat evaluation model was developed to use output from OPTIONS to determine stand structure and corresponding habitat classifications for each management unit at any point in time. Output from each OPTIONS scenario is run through this model to summarize stand structure changes, and therefore habitat classification changes, over time. Stand structure parameters, output from OPTIONS, are linked to a stand structure classification model, which is linked to GIS for visual display of habitat classification changes.

2.3 REPLACEMENT OF MANAGEMENT UNITS WITH FOREST INVENTORY POLYGONS

The June 1996 HCP used Plum Creek's January 1, 1994 inventory database as the foundation for the creation of operational management units and analysis for the HCP Planning Area. More than 4,000 management units, averaging 42 acres in size (ranging from 2 to 110 acres) were created for Plum Creek's ownership in the Planning Area. Each management unit was designed to meet state regulations for harvest prescriptions. The management units were then combined with the forest inventory data to create a new data base. This new data base was then used by FIBRPLAN (a forest estate planning model) to simulate harvest and growth.

The mitigation measures agreed to by Plum Creek to minimize and avoid impacts to species addressed in the HCP (Section 3.6), include actions by Plum Creek to revise and update its forest inventory to obtain more precise information on more acres of Plum Creek owned lands in the Planning Area (Section 3.6.10). Further, the HCP contemplated the need to evaluate stand structure flexibility (Section 5.3.5) and anticipated that future habitat projections may need to be modified as a result of intensive forest inventories completed by Plum Creek during the first two years of the HCP (Section 5.3.3.2).

Plum Creek has replaced the January 1, 1994 inventory database with the January 1, 1997 inventory database. The January 1, 1997 database is being used as the foundation for the creation of forest inventory polygons and re-analysis of the HCP Planning Area. The new database is being re-evaluated using the windows-based, forest estate planning model OPTIONS (Section 2.7). OPTIONS has more capabilities than FIBRPLAN and is being used to simulate growth, silvicultural activities, ecological constraints, and harvesting for the large, complex, forest land base.

Based on the Plum Creek's need to manage its properties in a logical, operational manner, Plum Creek subdivided its entire ownership within the Planning Area into forest inventory polygons. Over 5,000 forest inventory polygons, averaging 32 acres in size, were identified for Plum Creek's ownership within the Planning Area. Forest inventory polygons range from 1 to 612 acres. Each polygon was defined by tree species, tree size, and stocking information. By using forest inventory polygons, Plum Creek was able to more accurately model existing conditions in the Planning Area. This new database was then used by OPTIONS (Section 2.7) to simulate harvest and growth.



With the change to inventory polygons, the assessment of habitat for Lifeform 4 in talus slope areas had to change to accommodate the new database. For this analysis the Department of Natural Resources soil type map was overlaid onto the Planning Area stand structure types. If a stand polygon contained at least 50 percent rock or rubble soil types, the stand was included in the search area for Lifeform 4 habitat analysis. Once the land exchange is finalized, a new layer will be developed to more precisely identify stand structures around talus slopes.

2.4 MODIFICATION TO TABLES IN THE HCP

The results of the preceding changes are summarized in Tables C, D, 26B, and 30B.

Table C. Estimated percentages of Plum Creek (PC) ownership in the Planning Area providing spotted owl habitat and forest structural stages as a result of changes documented in Appendix 2. Percentages are estimated and displayed by decade for the 50 year Permit period. Compare to HCP Table 24.

Category*	Plum Creek YEAR											
	1996		2006		2016		2026		2036		2045	
	HCP	Rev	HCP	Rev	HCP	Rev	HCP	Rev	HCP	Rev	HCP	Rev
Spotted Owl Habitat												
NRF	20	20	12	13	9	10	8	9	9	9	9	10
F/D	20	17	17	12	18	10	27	18	37	27	46	34
Total (Percent)	40	37	29	25	27	20	35	27	46	36	55	44
Structural Stages												
SI/SS/YF	40	46	41	56	36	40	24	27	17	21	15	23
Pole Timber	9	7	19	7	28	24	30	28	26	25	20	16
Dispersal Forest	19	15	14	11	14	12	24	21	33	29	38	34
MF/MOG/OG	24	24	18	18	14	16	14	16	16	17	19	19
Non-Forested	8	8	8	8	8	8	8	8	8	8	8	8
Total (Percent)	100	100	100	100	100	100	100	100	100	100	100	100

*Notes: Goals for spotted owl habitat and structural stages will be achieved if measurements are within 10 to 20 percent of the values estimated in the table. "Rev" refers to revised percentages.

NRF - Nesting/Roosting/Foraging

SS - Shrub/Sapling

MOG - Managed Old Growth

FD - Foraging/Dispersal

YF - Young Forest

OG - Old Growth

SI - Stand Initiation

MF - Mature Forest

Table D. Estimated percentages on all ownerships in the HCP Planning Area providing spotted owl habitat and forest structural stages as a result of changes documented in Appendix 2. **Percentages are estimated and displayed by decade for the 50 year Permit period. Compare to HCP Table 24.**

Category*	All Ownerships in Planning Area											
	YEAR											
	1996		2006		2016		2026		2036		2045	
	HCP	Rev	HCP	Rev	HCP	Rev	HCP	Rev	HCP	Rev	HCP	Rev
Spotted Owl Habitat												
NRF	28	29	25	27	23	26	23	26	23	27	26	27
F/D	20	18	18	15	17	15	23	19	31	22	35	26
Total (Percent)	48	47	43	42	40	41	46	45	54	49	61	53
Structural Stages												
SI/SS/YF	28	30	28	32	24	22	14	15	11	12	11	13
Pole Timber	7	5	11	6	18	14	22	15	18	14	13	9
Dispersal Forest	17	13	15	10	14	11	20	16	27	19	29	21
MF/MOG/OG	36	39	34	39	32	40	32	41	32	42	35	44
Non-Forested	12	13	12	13	12	13	12	13	12	13	12	13
Total (Percent)	100	100	100	100	100	100	100	100	100	100	100	100

*Notes: Goals for spotted owl habitat and structural stages will be achieved if measurements are within 10 to 20 percent of the values estimated in the table.

NRF - Nesting/Roosting/Foraging
FD - Foraging/Dispersal
SI - Stand Initiation

SS - Shrub/Sapling
YF - Young Forest
MF - Mature Forest

MOG - Managed Old Growth
OG - Old Growth



Table 26B. Pre-Land Exchange. Estimated percentages of all ownerships in the Planning Area providing primary (P) and total suitable habitat (SH) for each lifeform resulting from modification of the HCP. Percentages are estimates and displayed by decade for the 50 year Permit period.

Lifeform	Year											
	1996		2006		2016		2026		2036		2045	
	P ¹	SH ²	P	SH								
2	66	76	67	77	71	79	73	80	76	81	77	82
3	66	76	67	77	71	79	73	80	76	81	77	82
4	49	53	44	50	45	51	50	53	52	54	52	54
5	88		92		89		83		74		68	
6	17	52	14	50	9	48	8	47	6	46	4	45
7	24	55	22	54	25	56	23	55	21	54	18	52
8	27	53	30	55	33	58	27	56	22	53	17	50
9	23	51	21	50	23	54	23	55	21	54	18	52
10	57	68	55	67	64	74	72	78	75	79	74	78
11	57	72	55	71	64	76	72	80	75	81	74	81
12	66	68	67	70	71	74	73	76	76	78	77	80
13	52	64	49	61	50	65	57	70	61	72	65	72
13a	39	46	39	51	39	60	41	62	42	62	44	62
14	52	70	49	68	50	69	57	72	61	74	65	76
14a	39	46	39	44	39	45	41	49	42	52	44	55
15 (early)	30		32		23		15		12		13	
15 (middle)	18		16		25		31		33		30	
15 (late)	39		39		39		41		42		44	
16	66	76	67	77	71	79	73	80	76	81	77	82

¹ - Percentage of the HCP search area containing Primary Habitat

² - Percentage of the HCP search area containing Suitable Habitat = Primary Habitat + (Secondary Habitat/2)

³ - Percentage of the HCP Planning Area within 0.5-miles of an "edge" between forage and cover habitats

⁴ - Expresses the percentage of habitat in the HCP Planning Area containing early, middle, and late-aged forests.

Search Area: RHAs only (Lifeforms 1,2,3,6,7,9,12,16); Rocks and Talus (Lifeform 4); Entire Planning Area (Lifeforms 8,10,11,13,13a,14,14a,15)

Table 30B. Pre-Land Exchange. Estimated percentage of each structural stage for the entire Planning Area, Riparian Habitat Areas (RHAs), and rocks and talus slopes as a result of changes from the modification of the HCP.

Habitat Area	1996		2006		2016		2026		2036		2045	
	PC ¹	HCP ²	PC	HCP								
HCP³												
Non Habitat	8	13	8	13	8	13	8	13	8	13	8	13
Stand Initiation	3	8	8	7	8	4	8	3	9	4	11	5
Shrub/Sapling	7	3	14	6	7	3	5	2	3	1	6	3
Young Forest	36	18	34	18	25	15	14	10	9	7	6	5
Pole Timber	8	5	7	6	24	14	28	15	25	14	16	9
Dispersal Forest	15	13	11	10	12	11	22	16	29	19	34	20
Mature Forest	19	26	14	22	13	19	12	20	13	19	15	21
Managed Old Growth	3	8	3	11	2	13	2	12	2	13	2	14
Old Growth	2	6	1	7	1	8	1	9	2	9	2	10
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100
RHAs⁴												
Non Habitat	9	14	9	14	9	14	9	14	9	14	9	14
Stand Initiation	2	7	0	6	0	0	0	0	0	0	0	0
Shrub/Sapling	4	1	2	1	1	2	0	0	0	0	0	0
Young Forest	27	9	30	7	17	7	7	8	3	6	2	4
Pole Timber	8	3	7	5	18	6	22	5	18	4	12	5
Dispersal Forest	16	11	18	9	19	10	22	10	31	11	33	9
Mature Forest	26	32	26	28	29	27	32	26	31	26	36	28
Managed Old Growth	6	12	6	18	5	20	5	20	6	22	4	23
Old Growth	2	11	2	12	2	14	3	17	3	17	4	17
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100
TALUS⁵												
Non Habitat	34	44	34	44	34	44	34	44	34	44	34	44
Stand Initiation	0	2	4	3	3	1	3	1	3	1	5	2
Shrub/Sapling	1	0	11	5	7	3	0	0	2	1	1	0
Young Forest	11	5	7	4	15	7	11	5	3	2	4	2
Pole Timber	5	4	5	3	7	4	17	7	20	9	6	3
Dispersal Forest	19	12	14	8	12	8	13	8	16	9	29	14
Mature Forest	23	23	19	20	18	18	17	20	16	16	16	16
Managed Old Growth	4	7	3	8	2	10	3	10	3	12	2	13
Old Growth	3	3	2	5	2	5	2	5	3	6	2	6
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100

NOTES:

¹ Percentage of ownership, Plum Creek

² Percentage of all ownerships in the HCP Planning Area

³ Search area within entire HCP Planning Area

⁴ Search area within Riparian Habitat Areas and wetlands

⁵ Search area within Plum Creek's management units containing rock and talus slope areas

APPENDIX 3: Covered Lands



Township 17 North, Range 15 East, W.M.	
Section 5:	All
Section 7:	All
Section 9:	All
Section 11:	All
Section 13:	All
Section 15:	All
Section 17:	All
Section 19:	All
Section 21:	All
Section 23:	All
Section 25:	All
Section 27:	All
Section 29:	All
Section 31:	All
Section 33:	All
Section 35 :	All
Township 18 North, Range 15 East, W.M.	
Section 1	Lots 1-12, inclusive, S1/2
Section 2	Lots 1, 2, 3, 4, 5, 6, 7, 8, 11 and 12, S1/2SE1/4
Section 7:	All
Section 9:	All
Section 11:	All
Section 12	NE1/4NE1/4, W1/2NE1/4, NW1/4, N1/2SW1/4, NW1/4SE1/4
Section 13:	All
Section 15:	All
Section 17:	All
Township 19 North, Range 10 East, W.M.	
Section 1:	All
Section 3:	All
Section 4	Lots 1 to 4, inclusive, S1/2NE1/4, S1/2NW1/4, S1/2
Section 5:	All
Section 9:	N1/2, NW1/4SW1/4
Section 11:	N1/2, N1/2, S1/2
Township 19 North, Range 11 East, W.M.	
Section 1:	All
Section 3:	All
Section 5:	All
Section 6	That portion lying East of the thread of Sawmill

	Creek
Section 7:	All
Section 9:	All
Section 11:	All
Section 13:	All
Section 15:	All
Section 17:	All
Section 21:	NE1/4, NE1/4NW1/4, NE1/4SE1/4
Section 23:	All
Section 25:	All
Section 27:	E1/2, E1/2W1/2
Section 35:	E1/2, NW1/4, NE1/4SW1/4
Township 19 North, Range 12 East, W.M.	
Section 1:	All
Section 3:	All
Section 11:	All
Section 15:	All
Section 23:	All
Section 25:	All
Section 27:	All
Section 35:	All
Township 19 North, Range 13 East, W.M.	
Section 3:	All
Section 5:	All
Section 9:	All
Section 13:	All
Section 15:	All
Section 17:	All
Section 19:	All
Section 21:	All
Section 27:	All
Section 29:	All
Section 31:	All
Section 33:	All
Section 35:	All
Township 19 North, Range 14 East, W.M.	
Section 7:	All
Section 11:	All
Section 13:	All
Section 15:	All
Section 16:	All



Section 17:	All
Section 18:	All
Section 19:	All
Section 20:	All
Section 21:	All
Section 22:	All
Section 23:	All
Section 27:	All
Section 28:	All
Section 29:	All
Section 33:	All
Section 35:	All
Township 19 North, Range 15 East, W.M.	
Section 13:	N1/2
Section 15:	N1/2
Section 17:	All
Section 19:	All
Township 20 North, Range 9 East, W.M.	
Section 1:	W1/2
Section 3:	All
Section 4:	All
Section 5:	All
Section 6:	Fractional NE1/4, Fractional S1/2
Section 7:	NE1/4
Section 8:	NW1/4
Section 9:	N1/2
Section 13:	SW1/4
Section 15:	NW1/4, Fractional S1/2
Section 17:	All
Section 19:	Fractional NW1/4, Fractional N1/2SW1/4, E1/2
Section 21:	All
Section 23:	All
Section 25:	All
Section 27:	NE1/4, NE1/4NW1/4
Section 29:	NW1/4, N1/2SW1/4, W1/2NE1/4, NE1/4NE1/4
Section 35:	NE1/4, NE1/4NW1/4

Township 20 North, Range 10 East, W.M.	
Section 1:	Fractional NW1/4, S1/2
Section 2	Lots 1 to 4, inclusive, SE1/2NE1/4, S1/2NW1/4, SW1/4, SE1/4
Section 7:	Fractional N1/2, Fractional SE1/4
Section 9:	All
Section 11:	All
Section 13:	Fractional N1/2, Fractional SW1/4
Section 14	Lots 1 to 4, inclusive, NE1/4, NW1/4, N1/2SW1/4, N1/2SE1/4
Section 15:	All
Section 16	Lots 1 to 4, inclusive, NE1/4, NW1/4, N1/2SW1/4, N1/2SE1/4
Section 17:	Fractional N1/2, Fractional SE1/4
Section 19:	Fractional W1/2, SE1/4
Section 29:	Fractional S1/2, Fractional NW1/4
Section 30	Lots 1 to 7, inclusive, S1/2NE1/4, SE1/4NW1/4, E1/2SW1/4, SE1/4
Section 31:	All
Section 32	SE1/4NE1/4, W1/2, NE1/4SE1/4, S1/2SE1/4
Section 33:	All
Township 20 North, Range 11 East, W.M.	
Section 1:	All
Section 3: (Includes Timber Harvesting Rights on City of Tacoma lands)	That portion S1/2 and SE1/4NE1/4 lying Southerly Burlington Northern Railroad R/W, government lots 3 and 4, all those portions of S1/2N1/2 and N1/2S1/2 lying Northerly of the Burlington Northern Railroad R/W and those portions government lots 1 and 2 lying Southerly of Burlington Northern Railroad R/W
Section 5:	All
Section 6	Lots 1 to 7, inclusive, S1/2NE1/4, SE1/4NW1/4, E1/2SW1/4, SE1/4
Section 7	Lot 1, E1/2NE1/4, NW1/4NE1/4, NE1/4NW1/4
Section 9: (Includes Timber Harvesting Rights on City of Tacoma lands)	S1/2SW1/4, SE1/4, E1/2NE1/4 and those portions of the W1/2NE1/4, SE1/4NW1/4, N1/2SW1/4 lying Southerly of the Burlington Northern Railroad R/W, N1/2NW1/4, SW1/4NW1/4, all those portions of W1/2NE1/4, SE1/4NW1/4 and N1/2SW1/4 lying Northerly of the Burlington Northern Railroad R/W
Section 11:	All
Section 13:	SW1/4, W1/2SE1/4, SE1/4SE1/4
Section 15:	All
Section 17: (Includes Timber Harvesting Rights on	Those portions of the NE1/4, N1/2SE1/4,



City of Tacoma lands)	N1/2S1/2SE1/4 lying Easterly of BNRR R/W, W1/2, S1/2S1/2SE1/4 lying Easterly of BNRC R/W, and all those portions of W1/2NE1/4, NW1/4SE1/4 and SW1/4SE1/4 lying Westerly of BRNC RR R/W except 43.1 acres deeded to Tacoma under AFN 8591300454.
Section 21: (Includes Timber Harvesting Rights on City of Tacoma lands)	SE1/4, portions SW1/4NE1/4 and E1/2SW1/4, N1/2NE1/4, SE1/4NE1/4 and the Northeasterly diagonal 1/2 of the SW1/4NE1/4 and the Southwesterly diagonal 1/2 of the E1/2SW1/4 and that portion of the NW1/2 lying Northeasterly of the centerline of the US Forest Service Road as described in that easement to BNRC, dated 8/20/86, file 9/16/86 under AF#8609160567.
Section 23:	All
Section 25:	All
Section 27: (Includes Timber Harvesting Rights on City of Tacoma lands)	E1/2E1/2, NE diagonal 1/2 of the W3/4, all portions of W1/2 and W1/2SE1/4 lying Southwesterly of a line extending in a Southeasterly direction from the Northwest corner to the Southeast corner of the SW1/4SE1/4
Section 29:	All
Section 30	That portion lying East of the thread of Sawmill Creek
Section 31:	That portion lying East of the thread of Sawmill Creek
Section 32	All
Section 33:	All
Section 35:	All
Township 20 North, Range 12 East, W.M.	
Section 1:	Fractional NW1/4, Fractional S1/2, Partial fractional NE1/4, less 53.62 ac. Burlington Northern R/W
Section 3:	All
Section 11:	All
Section 13:	All
Section 15:	All
Section 23:	SW1/4 and E1/2, NW1/4
Section 25:	All
Section 27:	All
Section 35:	W1/2, W1/2NE1/4 and SE1/4, E1/2NE1/4
Township 20 North, Range 13 East, W.M.	

Section 1:	Portion of N1/2
Section 5:	All
Section 7:	All
Section 9:	N1/2 less 53.18 ac. Burlington Northern R/W, less 14.57 ac. former Milwaukee R/W, less that part SE1/4NW1/4 lying South of Burlington Northern R/W, NW1/4SW1/4, S1/2SW1/4, SE1/4
Section 14:	S1/2SW1/4, SW1/4SE1/4
Section 15:	All
Section 17:	All
Section 19:	All
Section 23:	All
Section 27:	All
Section 28:	S1/2SW1/4
Section 29:	All
Section 31:	All
Section 33:	All
Township 20 North, Range 14 East, W.M.	
Section 1:	E1/2NW1/4, NE1/4SW1/4
Township 20 North, Range 15 East, W.M.	
Section 5:	S1/2
Section 7:	NE1/4, N1/2SE1/4, E1/2NW1/4, NW1/4NW1/4
Section 8:	N1/2, N1/2SW1/4, N1/2SE1/4
Section 9:	E1/2, NW1/4, E1/2SW1/4, NW1/4SW1/4
Section 14:	N1/2S1/2
Section 15:	All
Section 16:	E1/2, E1/2NW1/4, NE1/4SW1/4
Township 21 North, Range 9 East, W.M.	
Section 8:	Lots 2, 6, 7, 8, 9, 12, S1/2SW1/4, SW1/4SE1/4
Section 15:	SW1/4
Section 16:	Lots 3, 5, 6, 9, SW1/4NW1/4, SW1/4, W1/2SE1/4, SE1/4SE1/4
Section 17:	N1/2
Section 18:	Fractional W1/2, SE1/4
Section 19:	All fractional
Section 20:	All
Section 21:	All
Section 22:	Lots 2, 31 4, 7, 8, W1/2NW1/4, SW1/4, S1/2SE1/4
Section 23:	S1/2S1/2, NW1/4SW1/4, NE1/4SE1/4
Section 24:	Lots 1, 4, 6, 7, NE1/4NE1/4, S1/2NE1/4, S1/2
Section 26:	All



Section 27:	All
Section 28:	All
Section 29:	All
Section 30:	Lots 1, 2, 3, 4, E1/2NW1/4, NE1/4, NE1/4SW1/4, NW1/4SE1/4, E1/2SE1/4
Section 31:	All fractional
Section 32:	N1/2N1/2, SE1/4NE1/4, SW1/4SW1/4
Section 33:	All
Section 34:	All
Section 35:	N1/2NW1/4
Section 36:	All
Township 21 North, Range 11 East, W.M.	
Section 3:	E1/2
Section 5:	Fractional E1/2, Fractional E1/2NW1/4
Section 9:	All
Section 11:	S1/2, W1/2NW1/4, SE1/4NW1/4, SW1/4NE1/4, those parts of lots 1, 2, NW1/4NE1/4 lying Southeast of Milwaukee R/W
Section 13:	N1/2
Section 15:	All
Section 17:	All
Section 19:	Fractional NE1/4, E1/2SE1/4
Section 21:	All
Section 23:	All
Section 25:	All
Section 27:	All
Section 29:	All
Section 31:	All
Section 33: (Includes Timber Harvesting Rights on City of Tacoma lands)	All
Section 35:	All
Township 21 North, Range 12 East, W.M.	
Section 1:	All
Section 27:	Fractional N1/2, SW1/4 less Burlington Northern R/W, SE1/4 North of Burlington Northern R/W less 0.57 ac. Milwaukee R/W
Section 35:	All less 67.75 ac. Burlington Northern R/W and 14.73 ac. Chicago, Milwaukee St. Paul R.R. Co.
Township 21 North, Range 13 East, W.M.	
Section 5:	Lot 1, 3, 4, 5, SE1/4NE1/4, NE1/4SE1/4, Less 11.50 ac. Overflow area
Section 9:	All fractional, less 0.88 ac. overflow area
Section 19:	All

Section 27:	All less 35.29 ac. overflow area
Section 31:	All less State Highway R/W, less West 500' of the North 3065' of lots 1, 2, and 3, and 1.38 ac. Sold
Township 21 North, Range 14 East, W.M.	
Section 8:	Portion of SE1/4NE1/4 East of overflow area
Section 9:	E1/2
Section 15:	All
Section 16:	E1/2NW1/4, E1/2SW1/4, E1/2
Section 21:	E1/2
Section 22:	All
Section 23:	All
Section 25:	All
Section 26:	All
Section 27:	N1/2
Section 28:	Lots 5, 7, 8, and 9, NE1/4NE1/4
Section 35:	N1/2, E1/2SE1/4
Section 36:	Lots 1-4, inclusive, W1/2NE1/4, NW1/4, SW1/4, W1/2SE1/4
Township 22 North, Range 11 East, W.M.	
Section 21:	NW1/4, SE1/4, W1/2NE1/4, SE1/4NE1/4
Section 23:	E1/2, Portion fractional W1/2
Section 25:	All
Section 27:	W1/2W1/2, SE1/4SW1/4, Portion of lots 3 and 4, SE1/4NW1/4, NE1/4SW1/4 lying West of Milwaukee R/W
Section 33:	All
Section 35:	Portion of lots 1-7, SW1/4SW1/4, less 11.52 ac. R/W across lots 2, 5 and 6
Township 22 North, Range 12 East, W.M.	
Section 25:	All
Township 22 North, Range 13 East, W.M.	
Section 31:	All

INDEX



INDEX

A

Adaptive Management 10, 11, 14, 23, 28, 82
 Adaptive Management Areas..... 10, 14
 Administratively Withdrawn Areas..... 10
 AMAs, *see Adaptive Management Areas* 11
 Aquatic 6, 10, 17, 21, 22, 23, 26, 67, 69, 82
 Aquatic Conservation Strategy..... 6, 21, 23
 Assumptions 5, 11, 13
 AWAs, *see Adaptive Management Areas*

B

Bald Eagle 67, 68
 Bull Trout 12, 81, 82

C

Connectivity..... 7, 11, 13
 Critical Habitat 15, 16
 Cumulative Effects..... 7, 23, 24

D

DCAs, *see Designated Conservation Areas*..... 10
 Deferrals..... 13, 14, 15, 21, 22, 24, 25
 Designated Conservation Areas 10, 13
 Dispersal Corridors 13
 Dispersal habitat 12, 13, 20

E

Ecosystem..... 10
 Endangered Species Act..... 6, 81
 ESA, *see Endangered Species Act*

F

FD, *see Foraging and Dispersal Habitat* 10, 13, 14, 20, 21, 24, 25
 FIBRPLAN 85, 87
 Fish Resources 82
 Foraging and Dispersal Habitat 10, 13, 14, 20, 21, 24, 25
 Forest Practices Rules and Regulations..... 12
 Forest Service 5, 6, 7, 8, 9, 10, 11, 12, 14, 16, 17, 18, 19, 21, 22, 23, 28, 86, 99

G

Goshawk..... 21, 24, 68
 Gray Wolf..... 12, 17, 81
 Grizzly Bear..... 12, 16, 81

I

IA, *see Implementation Agreement*..... 6, 12
 Impacts 7, 11, 17, 19, 20, 21, 24, 27, 82, 87
 Implementation 6, 7, 12, 17, 18, 19, 20, 21, 23, 24, 68, 69, 70, 81
 Implementation Agreement 6, 68, 81
 Incidental Take Permit 5, 6, 9, 12, 69, 81, 82
 ITP, *see Incidental Take Permit* 8, 26

L

Land Exchange..... 5, 6, 7, 9, 10, 12, 14, 15, 16, 17, 19, 22, 24, 25, 26, 28, 67, 69, 70, 88
 Landscape..... 16, 20, 85, 87
 Late-Successional Reserves..... 10, 11, 14
 Lifeforms..... 17, 85, 91
 LSR, *see Late-Successional Reserves*..... 6, 10, 11, 22, 25
 LWD, *see Large Woody Debris*..... 23

M

Marbled Murrelet..... 12, 14, 15, 16, 24, 25, 27, 81
 Matrix..... 6, 7, 10, 11, 14, 22, 25
 Mitigation..... 17, 24, 82, 87
 Monitoring..... 11, 22, 23, 25, 26, 67, 69, 82, 85

N

National Marine Fisheries Service..... 5
 Northern Spotted Owl..... 10, 12, 19, 28, 81
 Northwest Forest Plan..... 6, 10, 11, 20, 22
 NWFP, *see Northwest Forest Plan*..... 6, 7, 10, 11, 21, 22, 23

P

Peregrine Falcon..... 81
 Permit Period..... 9, 11, 12, 14, 18, 20, 24, 68, 85, 89, 90, 91
 Planning Area..... 5- 25, 68, 70, 81, 85, 86, 87, 88, 89, 90, 91, 92
 Public Comment..... 5, 6, 81

R

Recovery Plan for the Northern Spotted Owl..... 10, 27
 Recreation..... 7
 Research..... 11, 23, 27, 69
 Restoration..... 23
 RHAs, *see Riparian Habitat Areas*..... 17, 18, 19, 22, 23, 25, 69, 92
 Riparian Habitat Areas..... 13, 22, 23, 24, 25, 69, 92
 Riparian Habitat Protection..... 22
 Riparian Reserves..... 10, 17, 18, 19, 23
 Road Access..... 15
 Road Development and Maintenance..... 7
 RSPF, *see Resource Selection Probability Model*..... 13, 14

S

Snoqualmie Pass Adaptive Management Area..... 7, 11, 28
 SPAMA, *see Snoqualmie Pass Adoptive Management Area*..... 7, 23
 Species of Concern..... 12, 27
 Spotted Owl Habitat..... 13, 14, 17, 20, 21, 24, 89, 90
 Surveys..... 13, 14, 15, 16, 24, 25, 27, 69

T

Talus Slopes..... 20, 67, 68, 88
 Thinning..... 11, 85, 86

W

Water Quality..... 23, 24, 25, 82
 Watershed Analysis..... 22, 23, 25, 67, 69, 70
 Watershed Restoration..... 23
 Wetlands..... 17, 18, 19, 22, 82