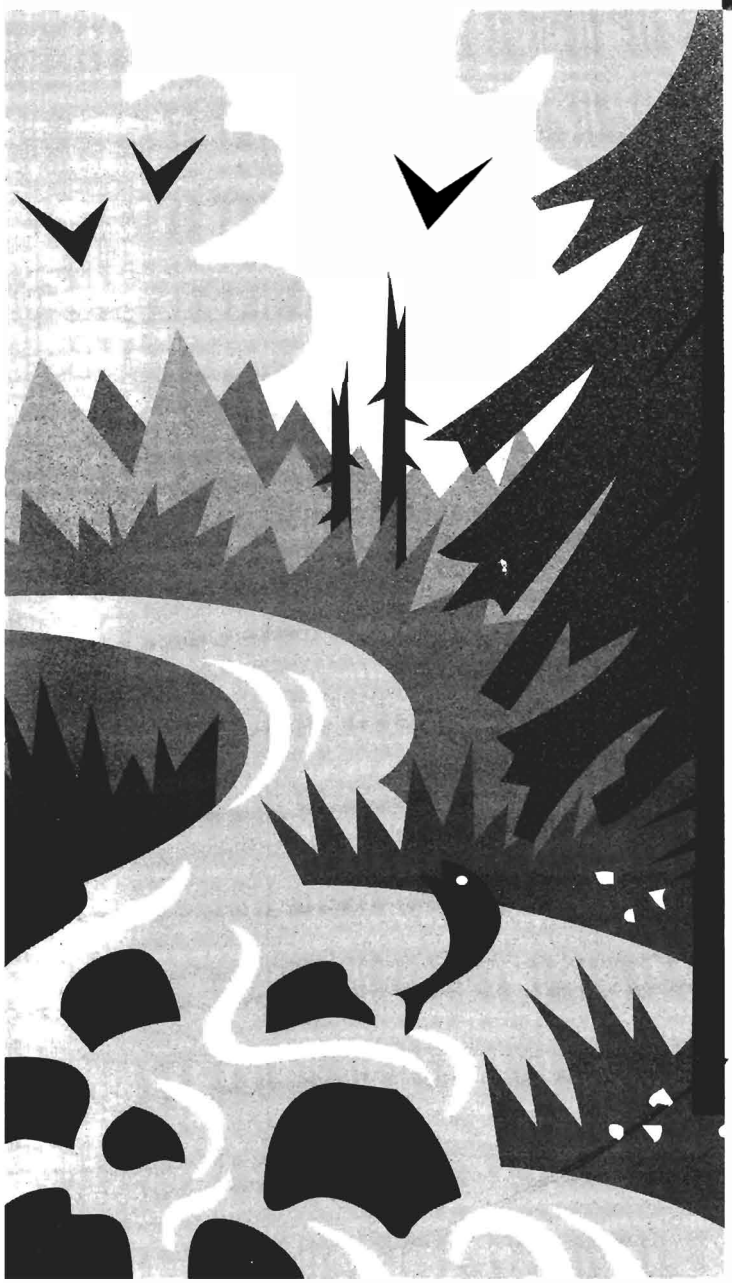
N A T U R A L R E S O U R C E S



FINAL

Environmental
Impact
Statement

HABITAT CONSERVATION PLAN

October 25, 1996

WASHINGTON STATE DEPARTMENT OF
Natural Resources

Jennifer M. Belcher - Commissioner of Public Lands
Kaleen Cottingham - Supervisor

WASHINGTON STATE DEPARTMENT OF
Natural Resources

October 15, 1996

Dear Interested Party:

Attached is a copy of the Final Environmental Impact Statement on the proposed incidental take permit and Habitat Conservation Plan (HCP) for the Washington Department of Natural Resources (DNR).

DNR has developed an HCP as an alternate method of complying with the Endangered Species Act on the 1.6 million acres of forested state trust lands that lie within the range of the northern spotted owl. These lands are managed under state law by DNR to benefit several trusts. The HCP is part of DNR's application to the U.S. Fish and Wildlife Service and the National Marine Fisheries Service for an incidental take permit and unlisted species agreement, under the authority of the Endangered Species Act. The permit would allow incidental take of listed species in the course of management activities on these 1.6 million acres. The unlisted species agreement would cover species that may be listed for protection in the future.

According to the requirements of the National Environmental Policy Act and the State Environmental Act, the draft HCP, the Draft Environmental Impact Statement, and the draft Implementation Agreement were made available for public review. During the formal public comment period that ended May 20, 1996, five public hearings were held around the state and numerous written comments were received.

The attached Final Environmental Impact Statement summarizes and responds to these comments. Resulting modifications to the HCP, the Draft Environmental Impact Statement, and the Implementation Agreement are also included.

Through the environmental review process, DNR's proposal and other reasonable alternatives were analyzed, evaluating the effects of the proposed action on issues and concerns such as threatened and endangered species and their habitats, other wildlife and their habitats, physical environmental factors, and effects on other elements of the human environment.

The Final Environmental Impact Statement will be available for review until December 2, 1996. For additional information, please contact William Vogel, U.S. Fish and Wildlife Service, 3704 Griffin Lane SE, Suite 102, Olympia, WA 98501; Chuck Turley, DNR, P.O. Box 47011,

Olympia, WA 98504-7011; or Steve Landino, National Marine Fisheries Service, 3773 Martin Way E., C-101, Olympia, WA 98501.

Sincerely,

JENNIFER M. BELCHER
Commissioner of Public Lands

CURT SMITCH
Assistant Regional Director
Fish and Wildlife Service
U.S. Department of the Interior

ELIZABETH GAAR
Habitat Branch Chief
National Marine Fisheries Service
National Oceanic and Atmospheric Agency
U.S. Department of Commerce

State Environmental Policy Act (SEPA) Fact Sheet

Title: Washington State Department of Natural Resources (DNR) Habitat Conservation Plan

DNR is proposing a habitat conservation plan (HCP) as a resource management strategy to assure long-term sustainable revenue for the trusts, health of the forest resources, and compliance with the Endangered Species Act. The HCP will continue implementation of the agency's chief policy and management document, the 1992 Forest Resource Plan. The HCP applies to approximately 1.6 million acres of DNR-managed forested trust lands within the range of the northern spotted owl. The proposed action, as defined in the State Environmental Policy Act (SEPA), is the adoption of the HCP by the Board of Natural Resources.

Proposed by: Washington State DNR

Lead Agencies:
Washington State DNR
U.S. Fish and Wildlife Service
National Marine Fisheries Service

Board of Natural Resources:
Jennifer Belcher, Commissioner of Public Lands
Judith Billings, Superintendent of Public Instruction
Dorothy Duncan, County Commissioner representing the Forest Board Counties
David Thorud, Dean, College of Forest Resources, University of Washington
Bob Nichols, Executive Policy Division, OFM - designee for Governor Mike Lowry
James Zuiches, Dean, College of Agriculture and Home Economics, Washington State University

Responsible Official: Terry Kirkpatrick, Acting Division Manager, Forest Resources Division

Authors and Contributors: For the full list of preparers, refer to Chapter 5 of the Draft EIS.

Licenses Required: No licenses are required to prepare and implement the proposed plan. An incidental take permit and unlisted species agreements were requested from the U.S. Fish and Wildlife Service and National Marine Fisheries Service. Site-specific activities conducted under the plan may require Forest Practices permits, hydraulics permits, and other licenses.

Draft Environmental Impact Statement Date of Issue: March 22, 1996

Public Comment Period: March 22 - May 23, 1996

Locations and Dates of Public Hearings:

Vancouver	April 15, 1996
Spokane	April 16, 1996
Seattle	April 18, 1996
Port Angeles	April 30, 1996
Olympia	May 6, 1996

Final Environmental Impact Statement Date of Issue: October 25, 1996

Contact Person and Written Testimony:
Chuck Turley
DNR - Habitat Conservation Plan
PO Box 47011
Olympia, WA 98504-7011

Please include the SEPA No. (94-042501) when corresponding about this project.

Proposed Adoption Date: Fall/Winter 1996

Reference Material and Data Located at:
Department of Natural Resources
Resource Planning and Asset Management Division
1111 Washington Street SE
PO Box 47014
Olympia, WA 98504-7014

Subsequent Environmental Review: The draft plan is considered a "nonproject proposal" (under WAC 197-11-442). It describes a plan for forest trust lands within the range of the northern spotted owl rather than site-specific activities. DNR recognizes that subsequent environmental review of proposed site-specific actions may be necessary at a future time but has not identified specific future activities or times. This FEIS will be used as appropriate to meet DNR's future responsibilities under SEPA.

National Environmental Policy Act (NEPA) Cover Sheet

Title of Proposed Action: Issuance of a Permit for Incidental Take of Federally-Listed Species and Implementation of the Multi-Species Plan for Lands Managed by WADNR within the range of the northern spotted owl.

Responsible Officials:

Mr. Thomas J. Dwyer
Deputy Regional Director
U.S. Fish and 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 and
Mr. Craig Hansen
U.S. Fish and Wildlife Service
3773 Martin Way East
Building C, Suite 101
Olympia, WA 98501
(360)534-9330

Mr. Steven W. Landino
Habitat Branch
National Marine
Fisheries Service
3773 Martin Way East
Building C, Suite 101
Olympia, WA 98501
(360)534-9330

For DNR's responsible official and contact, see the SEPA Fact Sheet on preceding page.

Legal Mandate: Endangered Species Act of 1973, as amended, Section 10(a), as implemented by C.F.R 17.22(b)(1) & 17.32(b)(1)

Applicant Name: Washington State Department of Natural Resources
1111 Washington Street SE
PO Box 47000
Olympia, WA 98504-7000

N A T U R A L R E S O U R C E S

FINAL

Environmental
Impact
Statement

HABITAT CONSERVATION PLAN

October 25, 1996

Washington State
Department of Natural Resources
1111 Washington ST SE
PO BOX 47000
Olympia WA 98504-7000

(360) 902-1000

Printed on recycled paper

Acronyms

C.F.R.	U.S. Code of Federal Regulations
CWD	Coarse woody debris
dbh	Diameter at breast height
DCA	Designated Conservation Area
DEIS	Draft environmental impact statement
DNR	Washington Department of Natural Resources
EIS	Environmental impact statement
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FEIS	Final environmental impact statement
FEMAT	Forest Ecosystem Management Assessment Team
FRP	Forest Resource Plan
FSEIS	Final supplemental environmental impact statement
GIS	Geographic information system
HAU	Hydrologic analysis unit
HCP	Habitat conservation plan
IA	Implementation agreement
ITP	Incidental Take Permit
LOD	Large organic debris
LPU	Landscape planning unit
LSR	Late-Successional Reserve
LULC	Land Use/Land Cover (DNR GIS data layer)
LWD	Large woody debris
MPL	Major Public Lands (DNR GIS data layer)
NAP	Natural Area Preserve
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NRCA	Natural Resource Conservation Area
NRF	Nesting, roosting and foraging habitat
OESF	Olympic Experimental State Forest
RCW	Revised Code of Washington
RMZ	Riparian management zone (as defined in WAC 222)
SEA	Special Emphasis Area
SEIS	Supplemental environmental impact statement
SEPA	State Environmental Policy Act
U.S.C.	U.S. Code
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WAU	Watershed administrative unit
WDF	Washington Department of Fisheries (merged into WDFW in 1994)
WDW	Washington Department of Wildlife (merged into WDFW in 1994)
WDFW	Washington Department of Fish and Wildlife
WFPB	Washington Forest Practices Board
WRIA	Water resource inventory area

Contents

Section 1. Background and Context

1-1 1.1 PROCESS

1-5 1.2 FORMAT FOR FEIS

Section 2. Changes to the Draft EIS

2-1 REVISIONS

2-1 Executive Summary

2-2 1. Purpose of and Need for Action
2-2 1.1 Introduction
2-2 1.2 DNR's Purpose and Need
2-2 1.3 USFWS' and NMFS' Purpose and Need
2-2 1.4 Regulatory Framework
2-2 1.5 Overview of the Olympic Experimental State Forest
2-2 1.6 Issues and Concerns
2-2 1.7 Overview of Remaining Chapters

2-2 2. Alternatives
2-2 2.1 Introduction
2-2 2.2 Development of DNR's Alternatives
2-2 2.3 Features Common to All Resaonable Alternatives
2-2 2.4 Range of Alternatives Originally Considered

2-2 2.5 Evaluation of Alternatives Related to Eight Planning Units in HCP Area (Excluding OESF)
2-3 2.6 Evaluation of Potential Olympic Experimental State Forest Alternatives

2-3 3. Environmental Setting
2-3 3.1 Summary of DNR-Managed Lands
2-3 3.2 Climate
2-3 3.3 Forest Disturbance on DNR-Managed Lands
2-3 3.4 General Stand Conditions

2-3 4. Affected Environment and Environmental Consequences
2-3 4.1 Chapter Organization
2-3 4.2 Five West-Side Planning Units (excluding OESF)
2-3 4.2.1 Northern Spotted Owl
2-4 4.2.2 Marbled Murrelet
2-7 4.3 Three East-side Planning Units

2-7 4.3.1 Northern Spotted Owl
2-8 4.4 Olympic Experimental State Forest Planning Area
2-10 4.5 Other Species and Habitats

2-41 4.6 Soil
2-41 4.7 Air Quality
2-41 4.8 Water Quality
2-41 4.9 Cultural Resources

2-42 4.10 Economic Analysis of DNR's Habitat Conservation Plan
2-44 4.11 Cumulative Effects

2-45 5. List of Preparers

2-49 6. Distribution List

2-49 Appendix A - DNR's Forest Management

2-49 Appendix B - Geology/Soils/Vegetation

2-49 Appendix C - Calculating Juvenile Survival Rates and the Finite Rate of Change of the Spotted Owl Population on the Olympic Peninsula

2-49 Appendix D - Methods for the Evaluation of Conservation Alternatives for Spotted Owl on the OESF

2-49 Glossary

2-49 References

2-51 Matrices

2-53 Tables

2-67 Figures

2-68 Maps

Section 3. Response to Comments

3-1 3.1 OUTLINE OF COMMENT CATEGORIES

3-7 3.2 COMMENT SUMMARIES AND RESPONSES

3-7 Comments relating specifically to this HCP
3-7 I. General Comments
3-7 II. Description of Area
3-9 III. Abiotic Issues
3-11 IV. Biotic Issues
3-117 V. Human Environment

3-122 VI. Management Practices
3-146 VII. Other Plan Elements
3-153 VIII. Implementation Issues
3-161 IX. Relationships to Other Land Management
3-164 X. Third-Party Involvement

3-166 XI. Trust Beneficiaries
3-170 XII. Public Involvement
3-172 XIII. NEPA/SEPA Comments
3-178 XIV. Approval/Disapproval

3-184 XV. Miscellaneous Comments
3-189 XVI. The HCP Process

3-193 3.3 ADDITIONAL TRIBAL COMMENTS

3-193 Comments relating specifically to this HCP
3-193 I. General Comments
3-193 II. Description of Area
3-193 III. Abiotic Issues
3-194 IV. Biotic Issues
3-198 V. Human Environment

3-199 VI. Management Practices
3-202 VII. Other Plan Elements
3-203 VIII. Implementation Issues
3-204 IX. Relationships to Other Land Management
3-204 X. Third-Party Involvement

3-205 XI. Trust Beneficiaries
3-206 XII. Public Involvement
3-206 XIII. NEPA/SEPA Comments
3-207 XIV. Approval/Disapproval
3-207 XV. Miscellaneous Comments

3-207 XVI. The HCP Process

Appendix 1. DEIS List of Commentors

A1-1 A. List of Commentors
A1-1 Cities, Ports, Water Districts
A1-1 Counties
A1-1 Environmental Organizations
A1-2 Federal Agencies
A1-2 Indian Tribes

A1-2 Industry Associations
A1-3 State Agencies
A1-3 State Legislative Delegation
A1-3 Universities
A1-3 Interested Individuals

A1-4 Other

Appendix 2. Distribution Lists

A2-1 Draft EIS Distribution List
A2-1 Federal
A2-1 U.S. Senate
A2-1 U. S. House of Representatives
A2-1 State
A2-2 State Legislators

A2-2 County
A2-3 Local
A2-3 Tribal
A2-4 Libraries
A2-6 Organizations

A2-7 Individuals
A2-15 Other

A2-8 Final EIS Distribution Plan
A2-8 Federal
A2-8 State
A2-8 State Legislators
A2-9 County
A2-9 Local

A2-9 Tribal
A2-10 Libraries
A2-10 Organizations
A2-11 Individuals

Appendix 3. Changes to DNR's draft Habitat Conservation Plan

A3-1 3.1 SUMMARY OF MAJOR CHANGES TO THE HCP IN RESPONSE TO PUBLIC COMMENT

A3-5 3.2 REVISIONS TO THE HABITAT CONSERVATION PLAN

A3-5 i. Executive Summary

A3-5 I. Introduction

A3-5 II. Planning Context

A3-6 III. Biological Data for Species Covered by the HCP
A3-6 **A**. Northern Spotted Owl
A3-6 **B**. Marbled Murrelet
A3-6 **C**. Other Federally Listed Species Within the Range of the Northern Spotted Owl
A3-7 **D**. Salmonids and the Riparian Ecosystem
A3-8 **E**. Other Species of Concern in the Area Covered by the HCP

A3-12 IV. The Habitat Conservation Plan
A3-12 **A**. Minimization and Mitigation for the Northern Spotted Owl in the Five West-side and All East-side Planning Units
A3-17 **B**. Minimization and Mitigation for the Marbled Murrelet in the Five West-side and the Olympic Experimental State Forest Planning Units
A3-19 **C**. Minimization and Mitigation for Other Federally Listed Species in All Planning Units

A3-22 **D**. Riparian Conservation Strategy for the Five West-side Planning Units
A3-33 **E**. Olympic Experimental State Forest Planning Unit
A3-38 **F**. Multispecies Conservation Strategy for Unlisted Species in the Five West-side Planning Units

A3-47 **G**. Conservation Assessments for Federally Listed Plant Species, Candidate Plant Species, and Plant Species of Concern
A3-54 **H**. Forest Land Management Activities

A3-62 V. Plan Implementation

A3-65 VI. Alternatives to the Habitat Conservation Plan that Would Avoid Take

A3-65 A Appendix - Geographic Analysis

A3-65 B Appendix - Draft Implementation Agreement

A3-66 References

A3-68 Glossary

A3-68 Tables

A3-85 Figures

A3-85 Maps

Appendix 4. Implementation Agreeement

A4-1 Implementation Agreement for the Washington State Department of Natural Resources Habitat Conservation Plan

A4-1 Background

A4-2 Agreement

A4-2 12.0 Definitions
A4-3 13.0 Incorporation by Reference
A4-4 14.0 Responsibilities of the PARTIES

A4-4 15.0 PERMIT LANDS
A4-4 16.0 Forest Product Sales and Other Management Activities Other Than Land Sales, Purchases, and Exchanges
A4-5 17.0 Land Transfers, Purchases, Sales, and Exchanges
A4-7 18.0 Funding
A4-7 19.0 Duration

A4-8 20.0 Reporting and Inspections
A4-8 21.0 Comprehensive Reviews
A4-9 22.0 Adequacy and Certainty
A4-9 23.0 Unforeseen Circumstances
A4-10 24.0 Extraordinary Circumstances

A4-12 25.0 Amendments and Modifications
A4-14 26.0 ITP Suspension or Revocation
A4-14 27.0 Termination and Mitigation after Termination
A4-16 28.0 Authority, Remedies and Enforcement
A4-16 29.0 Informal Dispute Resolution Procedures

A4-18 30.0 General Provisions
A4-19 31.0 Notices
A4-19 32.0 Designated Representatives

Appendix 5. Economic Information

A5-1 Harvest Projections and Economic Analysis

A5-1 Economic Analysis Procedure for DNR's Habitat Conservation Plan

A5-1 Overview of Analysis
A5-2 Sustainable harvest simulator
A5-2 Growth models
A5-3 Outside review of DNR's analysis

A5-3 Harvest Volume and Financial Analysis

A5-3 Introduction
A5-4 Assumptions
A5-5 Table 1: Draft Habitat Conservation Plan Assumptions Riparian Strategy

A5-7 Assumptions for Riparian Strategy
A5-8 Table 2: Draft Habitat Conservation Plan Assumptions for Spotted Owl Strategy

Appendix 6. No Surprises Policy

A6-1 No Surprises
Assuring Certainty for Private Landowners in Endangered Species Act Habitat Conservation Planning

A6-2 Purpose

A6-2 Supplementary Information

A6-2 Policy

SECTION

1.

Section 1 - Background and Context

Section 1.1 Process

Section 1. Background and Context

1.1 Process

Following the listing of the northern spotted owl and marbled murrelet, and in anticipation of the possible listing of salmon species, DNR began to consider an Habitat Conservation Plan (HCP), as an alternate method of complying with the Endangered Species Act on state trust lands. In 1993, DNR began development of an HCP for consideration by the Board of Natural Resources on department-managed trust lands. Initial contacts were made with the federal agencies that would likely be involved (U.S. Fish and Wildlife Service [USFWS] and National Marine Fisheries Service [NMFS], referred to jointly as the Services) to solicit information on how to approach an HCP. (This document will use the term "the Service" when referring to just the USFWS.)

To avoid duplication of effort, the Services and DNR decided to prepare an Environmental Impact Statement as co-lead agencies to fulfill both State Environmental Policy Act (SEPA) and National Environmental Policy Act (NEPA) requirements. Public scoping occurred in April and May, 1994, to help determine the scope of the project. Notice of intent to prepare an Environmental Impact Statement appeared in the Federal Register on May 2, 1994. Notice of scoping appeared in the SEPA Register on April 25 and May 13 of 1994. Formal scoping notices were mailed to the media and some 1,600 organizations and individuals, providing information on the background and purpose of DNR's HCP and public scoping workshops and requesting public comment. Ten public meetings were held around the state in May and June of 1994, with about 100 people attending. A citizen's advisory committee was consulted as representatives of the general interests of residents of the state. Two additional public workshops in December, 1993, and a separate citizen policy review committee provided input for the Olympic Experimental State Forest (OESF), a separate planning unit of the HCP. In addition to oral comments received at the workshops, written comments were received during the scoping period. Scoping reports summarizing the comments were prepared by the Services and DNR.

DNR formed a Science Team to prepare recommendations on managing forest lands to provide adequate habitat for listed species and to avoid disruptions in the event of future listings of additional species. The Science Team's recommended approach focused on complementing the conservation efforts being provided by federal land management agencies. The recommendations of the Science Team served as the basis for the HCP options developed by DNR.

The Board of Natural Resources has been involved in the HCP process from the beginning, through frequent presentations and discussions at the Board's regular public

meetings, as well as in special public workshops. In October and November of 1994, preliminary concepts for conservation strategies were presented at the Board's regular monthly public meetings. An open workshop of the Board of Natural Resources was held on February 2, 1995. That same month, following formal announcements to the media and some 3,000 individuals and organizations, four special public meetings of the Board were held around the state to hear comments from the public on the proposed options. Conservation strategies for spotted owls and riparian areas in the OESF, a separate planning unit of the HCP, were presented to the Board at their regular March and April, 1995, public meetings.

To compare effects of the HCP options and current practices on harvest levels and revenues to the trusts, DNR staff used computer modeling to project forest stand growth and harvestability 200 years into the future. The process and results were presented at a special public workshop of the Board on April 20, 1995. Harvest level and revenue projections for the OESF were presented at a regular public meeting of the Board on June 6, 1995. The Board then selected a preferred HCP option.

Over the next several months, the conservation strategies for the Board of Natural Resources-selected option were further developed. Calculations for the harvest level and sales revenue projections were also refined. The preliminary draft of the HCP was presented at the October, 1995 public meeting of the Board.

The Services and DNR prepared a joint Draft Environmental Impact Statement (DEIS) that analyzed DNR's proposal along with other reasonable alternatives, including current practices. The document evaluated the effects of implementation of the alternatives on issues and concerns such as threatened and endangered species and their habitats, other fish and wildlife and their habitats, environmental factors, and potential social and economic consequences.

The draft HCP, including a draft Implementation Agreement, was published and released for public comment in March 1996. The DEIS was published and released for public comment on March 22, 1996. The formal public comment period ended May 20, 1996. Notice of availability of these documents was published in the Federal Register on April 5, 1996 and in the SEPA Register on March 22, 1996. More than 900 copies of the DEIS and draft HCP were distributed and an additional 3,624 copies of Executive Summaries of the two documents were also distributed. (A detailed distribution list is included in Appendix 2 of this Final Environmental Impact Statement [FEIS].) The documents were also sent to state, local, and regional libraries. Notice of public hearings appeared in the Federal Register on April 10, 1996. Following notice to the media and some 3,000 organizations and individuals, the Board and the Services took testimony at five public hearings around the state in April and May, 1996, with a total of approximately 165 attending. A total of 173 comments were received (41 from public testimony which was transcribed), representing 181 individuals and organizations. (Summaries of testimonies from the hearings and written comments received during the comment period are included with responses from the Services and DNR in Section 3.2 of this FEIS, and a list of all commentors to the DEIS is found in Appendix 1.)

More than 3,000 individuals, organizations and agencies have been kept apprised of the planning process and alerted to opportunities to provide comments as the project has developed. All regularly scheduled and special meetings and workshops of the Board of Natural Resources follow the requirements of the Open Public Meetings Act and are open to the public; most offer time for public comment. In addition, the Commissioner of Public Lands and DNR staff have made more than 100 presentations to, and had discussions with, a variety of audiences, including trust beneficiaries, legislators, Tribes, and interested organizations, groups, and individuals.

The Services are currently fulfilling their obligations under Section 7 of the Endangered Species Act. Upon completion of the comment period and the associated review of the comments and revision of the proposed draft HCP, the Services initiated consultation/ conferencing under Section 7. This fulfills the need of a Section 7 intra-Service consultation and determines whether the Section 10 issuance criteria regarding the jeopardy standard is met. The Services will prepare the Section 7 documents, Section 10 Statement of Findings, and a Record of Decision prior to deciding whether to issue the Incidental Take Permit. Based on careful review of all documents, analyses, and public comments, the Board of Natural Resources will determine whether to enter into an agreement with the Services and adopt the draft HCP. A Notice of Issuance would be issued shortly after any approval and issuance of a permit.

((THIS PAGE INTENTIONALLY LEFT BLANK))

Section 1.2 Format for FEIS

1.2 Format for FEIS

This FEIS is written to amend the DEIS in response to public comment and to incorporate additional information, corrections, and modifications. As such, this FEIS incorporates the DEIS by reference and all portions of the DEIS should be considered valid and applicable except for those changes provided in this document.

The FEIS has three sections and six appendices. Section 1 contains this Background and Context. Section 2 contains changes to the DEIS presented in the same order as sections of the DEIS. Sections that do not change are labeled "No Change." Where a change to the DEIS occurs, that change is presented and discussed in the following manner. First, the nature of the change is explained (paragraph modified , word deleted, sentence added, etc.), then the change is shown in redline/strikeout (redline = additions, ~~strikeout~~ = deletions) format. Section 3 contains the outline used to categorize comments, then summaries of public comments and the responses from the Services and DNR, and then summaries of comments from Tribes that responded after the close of the comments period with responses from the Service, all according to the same comment category outline.

Appendix 1 lists all who provided comments in writing or in testimony at the public hearings during the formal public comment period. Appendix 2 lists organizations and individuals who received copies of the draft documents and those who will receive this FEIS in the initial distribution. Appendix 3 shows the changes to the draft HCP, following the order of chapters and sections in the original document, and using a similar format to that used in Section 2 for changes to the DEIS. Appendix 4 contains the revised Implementation Agreement. Appendix 5 contains information about the harvest projections and economic analysis conducted for the proposed HCP. Appendix 6 is a reproduction of the U.S. Department of the Interior's and U.S. Department of Commerce's 1994 No Surprises Policy.

SECTION

2.

Section 2 - Changes to the Draft EIS

Section 2. Changes to the Draft EIS

Revisions

Executive Summary

pg. i - add to the end of the last full paragraph:
The HCP planning area encompasses approximately 1.6 million acres of state forest land managed by DNR within the range of the northern spotted owl. The Olympic Experimental State Forest (OESF) is one of nine planning units in the HCP planning area. The term of the permit would be 70 to 100 years (See Implementation Agreement).

Introduction	No change
DNR's Purpose and Need	No change
Background	No change
Need for Action	No change
Purpose for Action	No change
Issues and Concerns	No change
Planning Area	No change
Description of HCP Alternatives	No change
Alternative A	No change
Alternative B	No change
Alternative C	No change
Description of OESF Alternatives	No change
Alternative 1	No change
Alternative 2	No change
Alternative 3	No change
Description of Management Strategies for the HCP and OESF Alternatives	No change
Environmental Conditions	No change
Environmental Consequences of Alternatives	No change
The Northern Spotted Owl	No change
Marbled Murrelet	No change
Riparian Conservation	No change
Environmental Consequences of OESF Alternatives on Spotted Owls Marbled Murrelets, and Riparian Zone Conservation	No change
Spotted Owl Conservation	No change
Marbled Murrelets	No change
Riparian Zone Conservation	No change
Other Resources of Concern	No change
Summary	No change

1. Purpose of and Need for Action

1.1 Introduction

pg. 1-1 - add to the end of the first paragraph:
The Olympic Experimental State Forest is one of nine planning units in the HCP planning area (see Map 2). The term of the permit would be 70 to 100 years (See Implementation Agreement).

1.2 DNR's Purpose and Need	No change
Context of the Proposed Action	No change
DNR's Need for Action	No change
Purpose of the Proposed Action	No change
1.3 USFWS' and NMFS' Purpose and Need	No change
U.S. Fish and Wildlife Service Context	No change
National Marine Fisheries Service Context	No change
1.4 Regulatory Framework	No change
DNR's Regulatory Framework for Compliance with Environmental Laws	No change
Overview of Federal Requirements for Species Conservation	No change
Brief Review of Listings with Major Impacts on DNR Management	No change
1.5 Overview of the Olympic Experimental State Forest	No change
1.6 Issues and Concerns	No change
1.7 Overview of Remaining Chapters	No change

2. Alternatives

2.1 Introduction	No change
2.2 Development of DNR's Alternatives	No change
2.3 Features Common to All Reasonable Alternatives	No change
2.4 Range of Alternatives Originally Considered	No change

2.5 Evaluation of Alternatives Related to Eight Planning Units in HCP Area (Excluding OESF)

Alternative A	No change

pg. 2-11 - change heading:
Alternative B (Preferred Alternative)

pg. 2-11 - change paragraph under heading Alternative B:
Alternative B is DNR's proposed alternative and is designed to meet all of the stated purposes and needs. Under this alternative, DNR would implement and HCP and receive an incidental take permit for spotted owls, marbled murrelets, and other federally listed species throughout the planning area, as issued by the Services, for 70 to 100 years (See Implementation Agreement)...

Alternative C

pg. 2-16 - change heading at top of page:
Alternative C (Environmentally Preferred Alternative)

Alternative D	No change
Alternative E	No change
Alternative F	No change
Alternative G	No change
Alternative H	No change
Alternative I	No change
Alternative J	No change
Alternative K	No change
Alternative L	No change
Alternative M	No change
Alternative N	No change
2.6 Evaluation of Potential Olympic Experimental State Forest Alternatives	No change
OESF Alternative 1	No change
OESF Alternative 2	No change
OESF Alternative 3	No change
OESF Alternative 4	No change
OESF Alternative 5	No change
OESF Alternative 6	No change
OESF Alternative 7	No change
OESF Alternative 8	No change
OESF Alternative 9	No change
OESF Alternative 10	No change

3. Environmental Setting	No change
3.1 Summary of DNR-Managed Lands	No change
3.1.1 Land Covered by the Proposal	No change
3.1.2 Land Use	No change
3.1.3 Adjacent Ownership	No change
3.2 Climate	No change
3.3 Forest Disturbance on DNR-Managed Lands	No change
3.4 General Stand Conditions	No change

4. Affected Environment and Environmental Consequences

4.1 Chapter Organization	No change
4.2 Five West-Side Planning Units (excluding OESF)	No change

4.2.1 Northern Spotted Owl

pg. 4-41 - change last paragraph:
DNR's goal under Alternative C would be to develop and maintain 146,100 acres of suitable nesting, roosting, and foraging habitat within NRF management areas over the

life of the HCP. This does not include the habitat that may be maintained or developed in the experimental management areas in the South Coast Planning Unit. The change in amount of potential nesting, roosting, and foraging habitat on DNR-managed lands is summarized in Tables 4.2.12 and 4.2.13. ~~DNR did not run a forest growth/harvest model for Alternative C so no comparison can be made of the change in age class distribution over the next 100 years among all three alternatives.~~

pg. 4-43 - change first paragraph:
...The remaining acres may or may not be functional spotted owl habitat. Other provisions of the HCP under Alternative C have been modeled and could result in the retention of ~~a similar amount of potential habitat to that which would occur outside of NRF areas under Alternative B (approximately 271,500~~ 447,300 acres) of forest older than 70 years outside of NRF areas, but it is difficult to predict what proportion of this potential habitat would occur in a configuration that would be useful to spotted owls.

4.2.2 Marbled Murrelet

pg. 4-99 and 4-100 - change last paragraph on pg. 4-99 and first paragraph on pg. 4-100:
In western Washington, critical habitat designations included Congressionally Withdrawn Areas (~~1,200~~1,800 acres), Late-Successional Reserves (~~1,220,900~~1,220,200 acres), DNR-managed lands (~~493,200~~426,800 acres) and private lands (~~4,400~~2,500 acres). U.S. Fish and Wildlife Service stated that any lands within critical habitat that are included in a habitat conservation plan that addresses the conservation of the marbled murrelet will be subsequently excluded from critical habitat designation ~~upon approval of~~ while an HCP approved ~~HCP~~ by USFWS is in effect. According to state regulations, when critical habitat is designated by the federal government, actions within these areas automatically become Class IV-Specials and a SEPA checklist is required. Much of state-managed and private land designated in the USFWS critical habitat ~~proposal~~ rule are also being included in potential habitat conservation plans. ~~The USFWS is now evaluating additional information in the form of public comments and recent research results prior to a final determination to be published in the Federal Register.~~

pg. 4-107 - change third paragraph:
The President's Forest Plan, national parks, and Administratively and Congressionally Withdrawn Areas will protect approximately 783,648 acres of potential nesting habitat (WFPB 1995a). The potential release for harvest of the so-called "318 sales" under Public Law (salvage rider bill) ~~will~~ could affect the amount of habitat protected by the President's Forest Plan. In Washington State, these 318 sales include 15 sale units in the Olympic National Forest and 20 sale units in the Mt. Baker National Forest that are believed to be occupied by marbled murrelets. ~~If the salvage rider bill is implemented~~ At this time, the Service does not expect occupied habitat from these sales ~~would~~ to be harvested. ~~This issue has not yet been resolved.~~ A small amount of additional habitat would also be protected by the forest practices rules discussed previously. No habitat is currently protected by the spotted owl proposed 4(d) special rule, as this process is not yet complete. Little habitat has been protected by other HCPs completed to date, although none of the lands covered by these HCPs currently have occupied stands ~~critical habitat~~

~~designation, or in habitat conservation plans because these processes are still in draft form and have not been finalized~~.

pg. 4-110 - change last paragraph:
The Forest Practices Board Science Advisory Group (SAG) on marbled murrelets made recommendations to the Washington Forest Practices Board regarding murrelet protection on nonfederal lands in Washington in 1993 (Cummins et al. 1993). They concluded that the creation of abrupt forest openings adjacent to occupied stands may result in negative impacts to the suitability of marbled murrelet nesting habitat related to changes such as increased wind velocity, solar radiation, temperature, tree mortality, canopy cover and decreases in humidity near stand edges. One of the ~~primary constituent elements~~ selection criteria in the designation of critical habitat by the USFWS was the presence of large contiguous blocks of habitat. The Marbled Murrelet Working Team that drafted the guidelines for protection of marbled murrelets in the President's Forest Plan designated large contiguous blocks of habitat (Late-Successional Reserves) as the primary means of protecting occupied sites and breeding potential on federal lands.

4.2.2.3 Environmental Consequences to the Marbled Murrelet

pg. 4-118 - change first paragraph:
~~The~~This section describes the probable consequences to the marbled murrelet and its habitat of implementing the three alternatives presented in this DEIS. This discussion includes descriptions of the direct physical and biological consequences of each alternative and the cumulative effects of these actions.

pg. 4-123 - change fourth paragraph:
Some future options for the protection of habitat would be lost under Alternative B as some marginal habitat as defined by the habitat relationship study is harvested (including some occupied sites), and as some suitable unoccupied habitat is harvested in ~~each~~ planning ~~unit~~ units outside of southwest Washington before the long-term plan is developed. These actions would reduce the options available for consideration in developing the long-term conservation plan. Harvest under this alternative could result in the loss of some occupied sites that may have been important in maintaining a more uniform distribution of occupied sites on the landscape, preventing the isolation of some breeding sites, and providing potential replacement habitat for breeding sites lost to natural disturbance events.

pg. 4-123 - change last paragraph on 4-123 and first paragraph on 4-124:
Loss of some occupied sites in marginal habitat may be significant in some areas such as southwest Washington and near-coastal areas of the Olympic Peninsula where very few breeding sites remain to support local populations. Survival of populations in these areas may be completely dependent on a few remaining patches of suitable habitat. Harvest of any of these remaining sites may greatly reduce the likelihood that local populations would persist over time in these areas. Alternative B's long-term plan should address the issue of providing suitable but unoccupied habitat to replace habitat loss to natural disturbances or specifically plan to develop suitable habitat in areas specified in the Draft Recovery Plan. ~~In addition, since Alternative B does not specifically address the issue of~~

~~providing suitable but unoccupied habitat to replace habitat loss to natural disturbances or specifically plan to develop suitable habitat in areas specified in the Drat Marbled Murrelet Recovery Plan, the likelihood of populations surviving in these areas may be diminished~~. A worst case analysis would indicate it is possible that Alternative B would result in the harvest of a maximum of 5 percent of the occupied sites, thus potentially eliminating nesting habitat for 5 percent of the population on DNR-managed lands...

pg. 4-124 - change last paragraph:
...Only sites with the lowest probabilities of occupancy would be available for harvest. Hamer et al. (1994b) found that the probability of occupancy of a site is directly related to the number of murrelet detections recorded at a site, with a higher number of detections more likely to be recorded at sites with higher probabilities of occupancy (Figure 4.2.10). This model may not fully capture the relationship between the number of detections and probability of occupancy. For example, anecdotal evidence suggests that murrelets may be less likely to vocalize when entering or leaving a stand with low numbers of murrelets, making detection less likely (K. Flotlin, personal communication). Although the exact relationship between the number of murrelet detections recorded at a site and the numbers of birds using a site is unknown, it is generally accepted that a higher number of detections indicate that a larger number of birds are using an area...

pg. 4-131 - add to the end of first full paragraph:
Under Alternative B...In southwest Washington, options for the future will be preserved by retaining high quality suitable, but unoccupied habitat.

pg. 4-132 - change the second paragraph:
Alternative B would allow and encourage cooperative research on the marbled murrelet to collect information over the interim period to better provide substantial and verifiable protective measures to occupied sites. Such research would not be prioritized under the No Action alternative. With this information, DNR could assess the potential for breeding and survival success of marbled murrelets, allowing more efficient planning and habitat conservation...

pg. 4-133 - change last paragraph:
Alternative C would provide similar enhancement of breeding potential to Alternative B, except that under Alternative C there would be no harvest of suitable unoccupied murrelet habitat in any planning unit (as compared to just southwest Washington for Alternative B) or marginal habitat within a planning unit until a long-term conservation plan is developed for the unit...

pg. 4-134 - change first full paragraph:
The proposed actions under Alternative C are more consistent with recovery actions outlined in the Draft Marbled Murrelet Recovery Plan (Marbled Murrelet Recovery Team 1995) than those of Alternative B because of the provisions for suitable unoccupied habitat as replacement habitat and objectives to develop suitable habitat in critical areas over time. Except for southwest Washington where the expected results of Alternatives B and C are similar, Alternative C has a higher likelihood than Alternative B of protecting the reproductive potential of the population because there will be an increased likelihood

of providing for interior forest conditions due to the additional suitable unoccupied habitat that would be available and maintenance of marginal habitat...

pg. 4-137 - change the first full paragraph:
Protection provided by the ~~USFWS critical habitat designations (59 Fed. Reg. 3811 (1994)),~~ spotted owl proposed 4 (d) special rule, additional habitat conservation plans, and from the proposed Washington State Forest Practices rule proposals for marbled murrelets is not yet known since these plans and processes have yet to be finalized. Therefore, the cumulative ~~a~~effects of these processes could not be analyzed. It is unknown if the results of these plans or rules will significantly add to the protection of the regional marbled murrelet population or not. USFWS critical habitat designations (61 Fed. Reg. 26256 (1996)) became final in May, 1996. Federal lands in reserve status under the President's Northwest Forest Plan provide the majority of lands that fall under critical habitat considerations. DNR-managed lands are currently designated to provide over 99 percent of the nonfederal critical habitat. The Service will conduct an assessment of the effects of DNR's proposed HCP on the critical habitat designation in its Biological Opinion. Additional protection to marbled murrelet populations from current forest practices rules and private land management policies is expected to be minimal. In addition, implementation of the Salvage Rider may result in a loss of 15 occupied sites on the Olympic Peninsula and 20 sites on the Mt. Baker National Forest, reducing the number of nesting opportunities for the marbled murrelet and further impacting the regional population. However, at this time, the Service does not expect harvesting in occupied habitat to occur as a result of the Salvage Rider. More detailed descriptions of these state, federal and private actions or plans are provided below.

pg. 4-138 - change the first full paragraph:
In addition, locating the majority of occupied sites and implementing landscape-level protection strategies for these areas would result in a higher likelihood of maintaining viable populations over time in western Washington. Alternative ~~C also~~ B provides ~~additional~~ interim protection to suitable but unoccupied habitat ~~and the long-term plan will include provisions for developing new habitat over time~~ in southwest Washington. Alternative C provides additional interim protection to suitable unoccupied habitat in all planning units and the long-term plan will include provisions for developing new habitat over time.

pg. 4-138 - delete second full paragraph entirely.
4.2.3 Description of the riparian ecosystem and a comparison of the HCP alternatives for protection of riparian ecosystem components No change

4.3 Three East-side Planning Units

4.3.1 Northern Spotted Owl

pg. 4-206 - change first full paragraph:
Results. Under Alternative B, 33 of the 78 known site centers do not have circles that overlap NRF management areas. The analysis indicates that timber harvest in 30 of these will exceed the rescinded USFWS take-avoidance guidelines (Table 4.3.15). Incidental

4.4.3 Analysis of the Northern Spotted Owl Conservation Strategy for the Olympic Experimental State Forest — No change

4.4.4 Analysis of Consequences to Marbled Murrelet, Other Wildlife and Plant Species in the OESF — No change

4.5 Other Species and Habitats

4.5.1 Section 10A Permit Species

pg. 4-357 - change paragraph under subhead Alternative B:
...Likewise, buffers around ponds and lakes that increase the abundance of waterfowl would benefit bald eagles by providing prey. The riparian management zones in the west-side planning units would be managed to provide large woody debris for salmonids, which should benefit bald eagles by maintaining large nest and/or roost trees 116 feet tall and 50-inch dbh (Anthony et al. 1982) along major watercourses...

pg. 4-359 - change paragraph under subheading Alternative B:
Although DNR's forest management activities are not anticipated to have major impacts on peregrine falcons or their habitat under any of the alternatives, Alternative B would improve habitat conditions over those provided in Alternative A by specifically addressing cliff habitat (potential nest sites) and specifying a detailed west-side riparian conservation strategy (prey habitat)...

pg. 4-361 - add to the end of the first paragraph under the subheading Alternative B:
...The spatial arrangement of spotted owl habitat in proximity to federal forests likely would provide wolves with travel opportunities. DNR will continue to participate in cooperative road closures with WDFW and the U.S. Forest Service to restrict vehicular activity to maintain or increase big game security. Additionally, to the extent practicable in appropriate areas, DNR will schedule management activities, including road construction and use, to occur at times of the year when wolves are least likely to be present.

pg. 4-361 - change last paragraph:
Although no other proactive consideration is given to wolves or public access in DNR's road strategy in this alternative, there would be a mechanism to protect wolves if they were observed on DNR-managed lands...

pg. 4-363 - add after first partial paragraph:
A substantial amount of post-emergence habitat occurs in low-elevation areas at the edge of the recovery zone. As of 1993, there were 104 Class I and Class II sightings in the Washington Cascades (Almack 1993). The locations of the North Cascades grizzly bear observations are widely distributed throughout the ecosystem. Locations and timing of locations indicate at least some of the grizzly bears in the local population are resident to the Washington Cascades, including reproductive females. The Service believes that higher open-road densities and minimal hiding cover could result in mortality and harassment of bears during a tenuous period in a natural-recovery process.

pg. 4-363 - change paragraph under subheading Alternative A:
Most importantly, no specific consideration would be given to grizzly bears or public access in DNR's road strategy under this alternative. ~~Without such consideration, c~~Conservation of grizzly bears and their habitat would be ~~minimal under Alternative A~~ governed by Section 9 of the ESA.

pg. 4-363 - change first paragraph under subheading Alternative B:
Improved wildlife habitat conditions afforded by the west-side riparian and northern spotted owl conservation strategies under this alternative might benefit grizzly bears. Increased hiding, resting, and travel cover (maintenance of debris and mature forest conditions) might improve access to prey/forage habitat (within harvest units and along west-side riparian areas).

pg. 4-364 - change first paragraph on page:
Because no proactive provisions to limit access or reduce road density are incorporated in this alternative, the benefits of increased habitat suitability in this alternative over Alternative A may not be fully realized. High active road densities, where present ~~if present~~, could decrease the probability that grizzly bears would occupy DNR-managed lands in those areas where this occurs...

pg. 4-364 - change second paragraph:
Overall, Alternative B's site-specific plans would provide ~~some~~ the potential for increased protection for grizzly bears and their habitat over Alternative A.

pg. 4-365 - change section heading:
4.5.2 ~~Candidate Species, Other~~Unlisted Fish and Wildlife Species

pg. 4-365 - change first paragraph:
In the following analysis of ~~unlisted~~ federal and state candidate species, federal species of concern, and other sensitive fish and wildlife species, brief descriptions of the biology and life history requirements of each species are presented before assessing the effects of the alternatives. A more comprehensive description of the species' biology and life history requirements, as well as their current federal and/or state status, is provided in Chapter III of the draft HCP.

pg. 4-365 - change second paragraph:
This analysis addresses the effects of the spotted owl and, to a limited extent, the marbled murrelet strategies, riparian ecosystem strategies, protection strategies for uncommon habitats, and species-specific protection measures, on particular unlisted species ~~of concern~~. For the west-side planning units, the effects of the alternatives are discussed, and action alternative effects are compared to the No Action alternative for each species whose range may include all or part of these planning units. For the OESF Planning Unit, analyses and comparisons are presented, as stated above, for the OESF No Action alternative, and Alternatives 2 and 3, for species whose range may include all or part of this planning unit. This analysis does not include the three east-side planning units because DNR is not seeking coverage for unlisted species east of the Cascade crest.

pg. 4-365 - change third paragraph:
...However, the owl and riparian conservation strategies under Alternative C provide greater amounts of late seral forest condition, owl dispersal habitat, and riparian protection than Alternative B, and may be of more benefit to unlisted species ~~of concern~~. The provisions to protect uncommon habitats and additional species-specific protection measures for unlisted species ~~of concern~~ are the same for both Alternatives B and C...

pg. 4-365 - change last paragraph:
A summary of conservation and protection measures by alternative is provided in ~~Table Matrices 4.5.1, and the following matrices.~~ Matrices 4.5.1a and 4.5.1b.

pg. 4-370 - change first paragraph:
Three species of molluscs that may occur in the HCP planning area are currently ~~candidates for federal listing~~ species of concern to the U.S. Fish and Wildlife Service (~~WDW 1993a; T. Frest, Deixis Consultants, Seattle, WA, pers. commun. to C. Turley, DNR, Olympia, WA, 1994~~ 61 Fed. Reg. 7457 (1996); USFWS 1996). Distribution and habitat requirements are not well understood for many aquatic molluscs; therefore, for the purposes of this analysis, all habitat needs for these species are assumed to be met in aquatic environments where they have been observed.

pg. 4-372 - change paragraph under heading Alternative B:
The management designed for protection of the riparian ecosystem under this alternative is expected to provide adequate guaranteed protection of the aquatic habitats considered important to the California floater and the great Columbia River spire snail where they occur on the west-side. Specific benefits of this alternative for aquatic species include the establishment of riparian management zones on all Type 1 through 4 Waters...

pg. 4-373 - change paragraph under heading Arthropods:
Seven species of arthropods known to occur, or that may occur, in the HCP planning area are currently species of concern to the U.S. Fish and Wildlife Service (61 Fed. Reg. 7457 (1996) or candidates for ~~federal or~~ state listing. An analysis of the effects of the alternatives on these species is discussed in the sections below.

pg. 4-374 - change paragraph under heading Alternative B:
...This protection is expected to be achieved primarily through the establishment of wetland buffers greater than or equal to 100 feet on all bogs greater than or equal to 0.25 acres, which is greater than current practices under Alternative A. Also, habitat known to be occupied by the Beller's ground beetle and Hatch's click beetle would continue to be protected in the Natural Area Preserves. DNR's *FRP* policies regarding the use of herbicides and pesticides would continue, which is the same as under the No Action alternative.

pg. 4-374 - change paragraph under heading Alternative C:
...This protection would be greater than the No Action alternative because of the guaranteed protection zones, and the no-harvest restriction in the wetland buffers. Also, habitat known to be occupied by the Beller's ground beetle and Hatch's click beetle would continue to be protected in the Natural Area Preserves. However, policies

regarding the use of herbicides and pesticides would be according to DNR's FRP, which is the same as under the No Action alternative.

pg. 4-378 - change OESF Alternative 2:
Under the unzoned alternative, it is predicted that 153,400 acres of suitable spotted owl habitat would be available in year 2096, approximately 20 percent of which would be ~~late-successional~~ old forest habitat available throughout the planning period. Old forest is defined as a forest that has characteristics of, and functions as, late successional forest and may possibly be developed through management. While providing ~~late-successional~~ old forest habitats is emphasized in this plan, habitat quality may be limited by the degree of mistletoe infestation in regenerating stands. Further, the degree of butterfly habitat connectivity that would result is unknown. However, the unzoned alternative appears to provide the greatest amount of potential hairstreak habitat that would be well distributed throughout the OESF.

pg. 4-379 - change first full paragraph:
Five ~~federal candidate species of~~ fish species, excluding ~~salmonid species~~ anadromous salmonids, are federal candidates for listing or species of concern to the U.S. Fish and Wildlife Service and are known to occur within the bounds of the west-side HCP planning units~~; one species~~. One of these, the Olympic mudminnow, is also a candidate for listing by the state. All the spawning, juvenile and rearing habitats for three of these species are provided by the freshwater aquatic environment...

pg. 4-381 - delete heading Green Sturgeon and entire first paragraph

pg. 4-381 - change paragraph under heading Alternative A:
Current management of the riparian ecosystem on DNR-managed lands is expected to provide some protection of suitable spawning and rearing habitats for the bull trout, Olympic mudminnow, and Pacific and river lampreys. ~~Green sturgeon spawning and juvenile rearing habitats are not known to occur in Washington State, and thus are not affected~~ This habitat receives the protection provided primarily by ~~DNR timber harvest activities within the HCP planning area~~ the establishment and protection of WMZs on nonforested wetlands and of riparian management zones on all identifiable Type 1 through 5 Waters according to DNR's FRP policies. ~~However, as mentioned above, some adult rearing habitat occurs along the Columbia River. This habitat receives the same protection as the spawning and rearing habitats described for the other four fish species, which is provided primarily by the establishment and protection of WMZs on nonforested wetlands and of riparian management zones on all identifiable Type 1 through 5 Waters according to DNR's FRP policies.~~ Based on a survey of timber sales sold on DNR-managed land since 1992, no timber management activity has occurred in 77 percent of the riparian management zones established on Type 1 through 5 Waters on DNR-managed land...

pg. 4-396 - change paragraph under heading Amphibians and Reptiles:
~~Seven~~ One species of ~~amphibians and two species of reptiles that occur in the HCP planning area are either~~ amphibian, the spotted frog, is a federal candidate for listing. Six

species of amphibians and two species of reptiles that occur in the HCP planning area are either species of concern to the U.S. Fish and Wildlife Service or state candidates for listing as threatened or endangered (WDW 1993a; 61 Fed. Reg. 7457 (1996); USFWS 1996). The habitat requirements of, and assessments of the effects of the alternatives on, each of these species are presented in the following sections.

pg. 4-397 - change paragraph under heading Alternative B:

...Under Alternative B, the conservation objectives for talus fields greater than or equal to 1 acre in size, or greater than or equal to 0.25 acre in size in most of the Columbia Planning Unit, are to maintain its physical integrity and minimize dramatic changes in microclimate. Talus fields would be protected by ~~preventing disturbance from logging~~ a no-harvest restriction and, ~~yarding, and~~ where practicable ~~and economically feasible~~, road construction and extraction of road building materials would be avoided. In addition, a 100-foot wide forested buffer would be maintained around these talus fields~~, and no more than 33 percent of the stems or volume would be harvested from the buffer~~. ~~These measures~~ Harvest would ~~adequately protect the integrity of the talus fields, and the microclimate within, but management~~ be permitted in the buffer ~~may negatively affect microclimate regimes within the buffered talus~~ but only where ~~Larch Mountain salamanders are known~~ 60 percent canopy cover could be retained, which is anticipated to ~~occur~~ adequately maintain the microclimate regimes within the buffered talus. In ~~addition, talus areas less~~ the forested talus outside of the buffer, no more than ~~1 acre in size would not~~ 33 percent of the volume would be ~~protected, and activity in or near these areas in~~ harvested. These measures would adequately protect the ~~Columbia and Klickitat planning units would likely negatively impact this salamander species, since these planning units contain the core of its range~~ integrity of the talus fields where Larch Mountain salamanders are known to occur. Under this alternative, cave entrances would be protected by a 250-foot no-harvest buffer which would maintain the microclimate near entrances, where these salamanders are known to occur, and by keeping cave locations confidential. This protection is substantially greater than Alternative A because of the specific conservation measures directed to special habitat types known to be used by Larch Mountain salamanders.

pg. 4-397 - change paragraph under heading Alternative C:

...Under this alternative, forested and nonforested wetlands would have the same buffers as Alternative B, which may protect some large woody debris and, when adjacent to talus fields, would provide more protection of Larch Mountain salamander habitat. ~~However, the same concerns for microclimate maintenance, as stated above, would exist.~~ Owl NRF habitat maintained or developed in the Klickitat and Columbia planning units, would be greater than Alternative B and, thus, Alternative A, with the same benefits. ~~Under Alternative C, the conservation objectives for talus fields and caves are the same as under Alternative B, and would provide the same~~ The protection ~~of Larch Mountain salamander~~ provided for uncommon habitat ~~as described above~~ types in Alternative C is the same as in Alternative B. ~~Overall~~ Therefore, protection of Larch Mountain salamander habitat under this alternative would be slightly greater than Alternative B because of the additional riparian protection that may include some additional talus fields, and substantially better than under the No Action alternative.

pg. 4-398 - change second full paragraph:
Dunn's and Van Dyke's salamanders are candidates for listing by the state (WDFW 1995b). The tailed frog (*Ascaphus truei*) is currently a ~~category 2 candidate for federal listing (59 Fed~~ species of concern to the U.S. Fish and Wildlife Service and a state monitored species (WDW 1993a; 61 Fed. Reg. 7457 (1996); USFWS 1996). ~~Reg. 58982 (1994)) and a state monitor species (WDW 1993a).~~ These species utilize similar habitats for breeding, foraging, and resting. Thus, for purposes of this assessment, the effects of the alternatives on these species have been combined.

pg. 4-399 and 4-400 - change paragraph under heading Alternative B:
...Riparian buffers would be established as described in DEIS Chapter 2 and in draft HCP Chapter IV. This protection includes 100-foot buffers on Type 4 streams where these species are known to occur. Based on current No Action activities and the protection of steep and unstable slopes of this alternative, it is anticipated that greater than 50 percent of Type 5 streams will be protected by restrictions on management activities near these streams...Talus fields that are greater than or equal to 1 acre in size throughout the HCP area, and greater than or equal to 0.25 acre in the Columbia Planning Unit, would be protected as described in draft HCP Chapter IV, Section F and Appendix 3, Chapter IV, Section F, in this document. Van Dyke's salamander may be found in seeps within old-growth forests.

pg. 4-406 - change paragraph under heading Birds:
Twenty priority species of birds may occur in the HCP planning area. Thirteen of these ~~species~~ are ~~federal~~ species of concern to the U.S. Fish and Wildlife Service or state candidates for listing. One species, the Sandhill crane, is listed as endangered by the state...

pg. 4-410 and 4-411 - change paragraph under heading Alternative B:
Under this alternative, wetland buffers would be slightly larger than under Alternative A, but they would likely incur some management. Harvests in riparian and wetland buffers would probably reduce the number of suitable cavities for nesting, ~~but~~ however the ~~Washington Forest Practices Rules leave tree requirement~~ 25-foot no-harvest and minimal-harvest zones would ~~provide additional~~ ensure that some cavity trees near stream banks would be retained. Openings created by some harvest entries may~~, however,~~ provide plant foods for species like the wood duck. Wind buffers, where designated, may provide additional area to buffers which could reduce disturbance and provide additional cavities for cavity-nesting ducks. The ~~requirement for three wildlife reserve trees~~ provision to retain three snags and ~~two~~ five green ~~recruitment trees may~~ trees per acre, as well as the provision to retain large, unique wildlife trees, would also provide potential cavity trees for use by cavity-nesting ducks when located near riparian buffers. Overall, Alternative B ~~may be slightly more beneficial in the long term than Alternative A because of the assurance of establishing riparian and wetland buffers of a guaranteed width. In the short term, however, the amount of habitat available under Alternative B~~ would be ~~less than that provided under Alternative A~~ more beneficial in the long term than Alternative A because of the assurance of establishing no-harvest and ~~minimal-~~harvest riparian and wetland buffers of a guaranteed width, and the provision to protect snags and provide green trees with the potential to become future cavity trees.

pg. 4-411 - change paragraph under heading Alternative C:
Under this alternative, riparian and wetland management zones would be similar to Alternative B, except that wind buffers would be added to each side of the Type 1 through 3 Waters, and wetland buffers would have a 50 foot no-harvest area (DEIS Chapter 2). ~~Implementation of this alternative could result in a reduction in habitat, in riparian areas adjacent to Type 1 through 3 Waters, from Alternative A because it provides smaller buffers that may be harvested~~. The addition of wind buffers would widen the riparian protection, compared to Alternative B, ~~but management activity could be conducted~~ and only restoration activities would be permitted. Harvests in riparian and wetland buffers would probably reduce the number of suitable cavities for nesting, however, the 50-foot no-harvest provision for wetlands, and the 25-foot no-harvest and minimal-harvest zones in the riparian buffer would ensure that some cavity trees near wetlands and stream banks would be retained. ~~Only restoration activities would be permitted in the wind buffers, and with the Washington Forest Practices Rules leave tree requirement, there would be some cavity trees available for use~~ Openings created by ~~cavity-nesting ducks~~ some harvest entries may provide plant foods for species like the wood duck. Wind buffers, where designated, may provide additional area to buffers which could reduce disturbance and provide additional cavities for cavity-nesting ducks. The provision to retain three snags and five green trees per acre, as well as the provision to retain large, unique wildlife trees would also provide potential cavity trees for use by cavity-nesting ducks when located near riparian buffers. Under Alternative C, the larger and less disturbed riparian buffers and the no-harvest portion of the wetland buffers may increase nesting habitat suitability by providing more suitable cavity trees and snags adjacent to foraging and brooding areas, and reducing the probability of disturbance from human activities. ~~This alternative may be as beneficial as the No Action alternative if present and future cavity trees and snags are preserved in buffers around larger streams.~~

pg. 4-411 - change paragraph under heading OESF Action Alternatives:
...The addition of an exterior buffer would likely benefit cavity-nesting ducks if suitable cavity trees are retained within riparian zones. ~~These~~ With the same snag and green tree retention conservation strategy as in Alternatives B and C, these alternatives would provide ~~more support if designated buffers were targeted to become or remain late-successional forests~~ and protect more current and potential cavity trees than the No Action alternative.

pg. 4-413 - change paragraph under heading Alternative B:
The combination of the riparian and spotted owl conservation strategies should provide forest conditions suitable for northern goshawk breeding, foraging, and resting habitat. In concert, these strategies should ensure the development of ~~large~~ contiguous landscapes of ~~mature and~~ sub-mature to old-growth forest...

pg. 4-414 - change first full paragraph:
...In total, 40-42 percent of the area managed for spotted owl breeding habitat would be sub-mature to ~~or~~ old-growth forest. The landscape conditions in the areas managed as spotted owl breeding habitat would meet or exceed the habitat recommendations made by Reynolds et al. (1992)

pg. 4-415 - add a new second paragraph:
In addition, the strategy to retain three snags and five green trees per acre of harvest would benefit goshawks by providing habitat for prey species and potential future nest trees in upland areas. This conservation measure is enhanced by the added provisions to include one tree from the largest diameter size class, and to retain large, structurally unique trees valuable to wildlife, where possible. This conservation measure would complement the owl and riparian strategies to provide more habitat than that provided under Alternative A.

pg. 4-415 - change first paragraph under heading Alternative C:
...In concert, these strategies should ensure the development of ~~large~~ somewhat larger contiguous landscapes of ~~mature and~~ sub-mature to old-growth forest than Alternative B.

pg. 4-415 - change fifth paragraph:
~~Under Alternative C,~~ The snag and green tree retention conservation measure, as well as the restriction on activities within 0.55 mile of a known active goshawk nest, within NRF-designated areas, would be the same as ~~described in~~ under Alternative B. ~~These~~ As such, the benefits to goshawks would be the same and complement~~ary~~ to the owl and riparian conservation strategies~~ and protection measures would be of~~, which would be more ~~benefit~~ beneficial to ~~the goshawk than~~ goshawks than what is ~~provide~~ provided under Alternative A.

pg. 4-416 - change paragraph under heading OESF Alternative 2:
...~~Together, the owl~~ In addition, the strategy~~, and the guaranteed riparian~~ to retain three snags and ~~wetland management zones,~~ five green trees per acre of harvest would ~~provide adequate suitable goshawk~~ benefit goshawks by providing habitat ~~throughout the OESF~~ for prey species and potential future nest trees in upland areas. This conservation measure is enhanced by the added provisions to include one tree from the largest diameter size class and to retain large, structurally unique trees valuable to wildlife, where possible. Together, the owl strategy, the snag and leave tree strategy, and the guaranteed riparian and wetland management zones would provide adequate suitable goshawk habitat throughout the OESF. This goshawk habitat would be more than that provided under the No Action alternative.

pg. 4-416 - change paragraph under heading OESF Alternative 3:
...Nevertheless, the owl strategy, the snag and green tree retention strategy described in Alternative 2, and the guaranteed riparian and wetland management zones would provide adequate suitable goshawk habitat in the OESF. This goshawk habitat would be more than that provided under the No Action alternative.

pg. 4-417 - change paragraph under heading Alternative B:
...In total, approximately 40 percent of the area managed for spotted owl breeding habitat would be ~~mature or~~ sub-mature to old-growth forest which should provide an adequate supply of potentially suitable nest trees. Cliffs may also be used as nest sites for golden eagles. Under Alternative B, there is a provision for some cliff protection whereby mining of rock from cliffs for road construction would be avoided when materials can otherwise be reasonably acquired, although this would not be guaranteed protection from

disturbance. DNR would also evaluate, in coordination with USFWS, and protect the integrity of cliffs judged suitable for and likely to be used by wildlife. Trees along the base and top of cliffs suitable for nesting raptors would be retained. In addition, very large, old trees specified for retention under this alternative would be available as potential nest trees for golden eagles...

pg. 4-417 and 4-418 - change paragraph under heading Alternative C:
...In areas managed for spotted owl breeding haabitat, at least 60 percent of the areas in each WAU would be sub-mature forest or higher quality habitat with old-growth quality features~~.The areas managed for spotted owl breeding habitat would contain mature or old-growth forest~~ which would provide an adequate supply of potentially suitable nest trees...

pg. 4-421 and 4-422 - change paragraph under heading Alternative B:
The combination of the riparian and spotted owl conservation strategies should provide forest conditions suitable for Vaux's swift breeding, foraging, and resting habitat. In concert, these strategies should ensure the development of large contiguous landscapes of sub-mature ~~and~~ to old-growth forest containing large live trees and snags...The large, old trees would be selected for their unique structural characteristics or because they are considered to be old-growth remnants~~, and at least half the trees would belong to the size class of the largest diameter living trees in the harvest unit~~. ~~These trees would have~~ Under the ~~potential to become suitable snags~~ snag and green tree retention strategy, three snags per acre harvested would be retained with a preference shown for ~~Vaux's swift in the future~~ protection of hard snags with bark, greater than 40 feet in height where available, and one of the five green trees being retained per acre harvested would belong to the size class of the largest diameter living trees in the harvest unit. ~~Alternative B does not address specific protection of large snags, providing additional snags, or measures describing how potential suitable snags~~ These green trees would ~~be retained~~ have the potential to become suitable snags for Vaux's swift in the future. ~~However,~~ Under Alternative B, the protection and maintenance of potential Vaux's swift habitat, as well as known occupied sites, is guaranteed ~~under this alternative,~~ and is substantially greater than that provided under the No Action alternative.

pg. 4-422 - change paragraph under heading Alternative C:
The combination of the riparian and spotted owl conservation strategies should provide forest conditions suitable for Vaux's swift breeding, foraging, and resting habitat. In concert, these strategies should ensure the development of large contiguous landscapes of ~~mature and~~ sub-mature to old-growth forest containing large live trees and snags...Like Alternative B, Alternative C ~~does not address specific protection of large snags, providing additional snags, or measures describing how potential suitable snags~~ would ~~be retained~~ have the snag and green tree retention strategy. ~~However, the~~The protection and maintenance of potential Vaux's swift habitat, as well as known occupied sites, is guaranteed under this alternative and is substantially greater than that provided under the No Action alternative.

pg. 4-422 and 4-423 - change paragraph under heading OESF Alternative 2:
...In addition, specific provisions for protection of very large, old trees, snag and green tree retention, and protection of known Vaux's swift night roosts and active nests as described in Alternative B would be implemented...

pg. 4-423 - change paragraph under heading OESF Alternative 3:
...In addition, specific provisions for protection of very large, old trees, snag and green tree retention, and protection of known Vaux's swift night roosts and active nests as described in Alternative B would be implemented...

pg. 4-424 - change paragraph under heading Alternative B:
...In concert, these strategies should ensure the development of large contiguous landscapes of sub-mature to ~~and~~ old-growth forest containing large live trees and snags...In addition, this alternative contains special provisions for protecting oak woodlands, ~~and very~~ large, ~~old~~ structurally unique trees, and retaining three snags and five green trees per acre harvested (~~draft HCP Chapter IV~~ Appendix 3, Chapter IV, Section F). These provisions would protect current and future potential Lewis' woodpecker habitat. These conservation measures are greater than under the No Action alternative because of the owl conservation strategy, guaranteed riparian buffers, and the special provisions to protect potential Lewis' woodpecker habitat in oak woodlands and large, ~~older~~ structurally unique trees, and snags.

pg. 4-424 - change paragraph under heading Alternative C:
...Like Alternative B, this alternative also contains special provisions for protecting oak woodlands ~~and~~, ~~very~~ large, ~~old~~ structurally unique trees, and providing snags and green trees as current and future habitat (DEIS Chapter 2). These conservation measures are greater than under the No Action alternative because of the owl conservation strategy, guaranteed riparian buffers, and the special provisions to protect potential Lewis' woodpecker habitat in oak woodlands and large, ~~older~~ structurally unique trees and snags.

pg. 4-425 - change paragraph under heading Alternative B:
...In concert, these strategies should ensure the development of large contiguous landscapes of sub-mature to ~~and~~ old-growth forest containing large live tree and snags...In addition, under this alternative, very large, ~~old~~ structurally unique trees would be retained, as part of the snag and green tree retention strategy, providing potential future suitable nest and roost sites for pileated woodpecker. Preference would be shown for hard snags with bark and at least 20 inches dbh. Where possible, snags 40 feet high would be retained. This protection would be guaranteed and would be substantially greater than under the No Action alternative.

pg. 4-426 - change paragraph under heading Alternative C:
...Like Alternative B, this alternative also contains special provisions for protecting very large, old trees (DEIS Chapter 2) providing potential future suitable nest and roost sites for pileated woodpecker, and for retaining additional snags and green trees. This protection is guaranteed and is substantially greater than under the No Action alternative.

pg. 4-426 - change paragraph under heading OESF Alternative 2:
...The provision for retaining very large, old trees, and snags and green trees described in Alternatives B and C above would also apply to this OESF action alternative...

pg. 4-426 and 4-427 - change paragraph under heading OESF Alternative 3:
...The provision for retaining very large, old trees, and snags and green trees described in Alternatives B and C above would also apply to this OESF action alternative...

pg. 4-427 - change first paragraph under heading Alternative B:
The combination of the riparian and spotted owl conservation strategies should provide forest conditions suitable for olive-sided flycatcher breeding, foraging, and resting habitat. In concert, these strategies should ensure the development of large contiguous landscapes of sub-mature to ~~and~~ old-growth forest...

pg. 4-427 and 4-428 - change last paragraph on 4-427 and first paragraph on 4-428:
...In addition, this alternative also contains a provision for conserving large, old trees important to wildlife, as part of the ~~Washington Forest Practices Rules leave~~ snag and green tree ~~requirement~~ retention strategy, which eventually may become snags preferred by the olive-sided flycatcher.

pg. 4-428 - change paragraph under heading Alternative C:
...In addition, this alternative also contains a provision for conserving large, old trees important to wildlife, as part of the ~~Washington Forest Practices Rules leave~~ snag and green tree ~~requirement~~ retention strategy, which eventually may become snags preferred by the olive-sided flycatcher.

pg. 4-431 - change paragraph under heading Alternative B:
...In concert, these strategies should ensure the development of large contiguous landscapes of ~~mature and~~ sub-mature to old-growth forest containing large live trees and snags. Ecosystem restoration within the riparian buffer would try to maintain the natural mix of conifer and deciduous species. In addition, this alternative contains a special provision for protecting very large, old trees as part of the snag and green tree retention strategy (~~HCP Chapter IV~~ Appendix 3, Chapter IV, Section F). The additional snags and green trees would function as a source of current and future habitat for purple martins. These conservation measures are greater than under the No Action alternative because of the owl conservation strategy, guaranteed riparian buffers, the snag and green tree retention strategy, and the special provision to protect large, older trees which may function in the future as purple martin habitat.

pg. 4-432 - change first paragraph:
...In concert, these strategies should ensure the development of large contiguous landscapes of ~~mature and~~ sub-mature to old-growth forest containing large live trees and snags. In addition, this alternative contains the special provision for protecting very large, old trees as part of the snag and green tree retention strategy (DEIS Chapter 2). The additional snags and green trees would function as a source of current and future habitat for purple martins. These conservation measures are greater than under the No Action alternative because of the owl conservation strategy, guaranteed riparian buffers, the snag

and green tree retention strategy, and the special provision to protect large, older trees which may function in the future as purple martin habitat.

pg. 4-432 - change paragraph under heading Alternative B:
...In addition, the provision to retain three snags and five green trees per acre harvested would ensure that current and future snags are available in upland areas for use by western bluebirds. This protection is guaranteed and is substantially greater than under the No Action alternative.

pg. 4-433 - change paragraph under heading Alternative C:
...In addition, the provision to retain three snags and five green trees per acre harvested would ensure that current and future snags are available in upland areas for use by western bluebirds. This protection is guaranteed and is substantially greater than under the No Action alternative.

pg. 4-434 - change paragraph under heading Alternative B:
...Harvestable riparian and wetland buffers, under Alternative B, could benefit band-tails if allowed to support understory food plants. In addition, impacts to mineral springs would be reduced by designing management activities within 200 feet of mineral springs to retain food sources, restrict herbicide spraying, avoid disturbance, and address other conservation needs. These management activities would be designed in coordination with USFWS. The commitment to guaranteed riparian and wetlands buffers, the provision to conduct limited management activities near mineral springs, and maintenance of 50 percent owl ~~breeding~~ habitat likely would provide more habitat for band-tailed pigeons in the long term than would Alternative A.

pg. 434 - change paragraph under heading Alternative C:
...Harvestable riparian and wetland buffers, under Alternative C, could benefit band-tails if allowed to support understory food plants. In addition, impacts to mineral springs would be reduced by designing management activities within 200 feet of mineral springs to retain food sources, restrict herbicide spraying, avoid disturbance, and address other conservation needs. These management activities would be designed in coordination with USFWS. The commitment to guaranteed riparian and wetlands buffers, the provision to conduct limited management activities near mineral springs, and maintenance of 60 percent owl ~~breeding~~ habitat likely would provide more habitat for band-tailed pigeons in the long term than would Alternative A.

pg. 4-435 - change first paragraph:
...The ~~guarantees of the riparian and wetland buffers, as well as the distribution of owl habitat throughout the OESF, would provide more band-tailed pigeon habitat than~~ provision for mineral spring protection described in Alternative ~~1~~ B would be the same under this alternative. The guarantees of the riparian and wetland buffers, the provision to conduct limited management activity near mineral springs, as well as the distribution of owl habitat throughout the OESF, would provide more band-tailed pigeon habitat than Alternative 1.

pg. 4-435 - change paragraph under heading OESF Alternative 3:
...Riparian and wetland provisions in this alternative are the same as Alternative 2, as well as the provision for mineral spring protection described in Alternative B, and would provide similar benefits to band-tailed pigeons. The amount of owl habitat would likely be less than what is currently available under ~~the~~ Alternative 1, but protection of mineral springs would likely provide more habitat in the long term~~, this may not continue~~ than under Alternative 1.

pg. 4-435 - replace paragraph under heading Mammals:
~~Twelve~~ Fifteen species of mammals that occur or may occur in the west-side HCP planning units are considered high priority species. Three species are federally listed, one is state listed, and ~~eight~~ nine are ~~candidates for~~ federal ~~listing~~ species of concern ~~(59 Fed. Reg. 58982-59028 (1994~~) 61 Fed. Reg. 7457 (1996); USFWS (1996), WDFW 1995b). An analysis of the state-listed western gray squirrel and the eight federal candidate species of concern as well as 2 additional priority bat species is provided below.

pg. 4-437 - change paragraph under heading Alternative B:
...In concert, these strategies should ensure the development of large contiguous landscapes of ~~mature and~~ sub-mature to old-growth forest containing large trees and snags. In addition, talus fields, cliffs, and caves would be protected as described in HCP Chapter IV, Section F and Appendix 3, Chapter IV, Section F, in this document. Live trees or snags that are known to be used by myotis bat species as communal roosts or maternity colonies would not be harvested. Under Alternative B, very large long-lived trees would be retained, as part of the snag and green tree retention strategy, providing potential suitable snags for maternal roosts in the future. ~~In addition, there is a provision directed toward preventing human disturbance to bat caves by keeping cave locations confidential~~ The snags protected and green trees provided in this latter conservation measure would ensure that potential roost sites would be available now and in the future. ~~These conservation measures are greater than what occurs under the No Action alternative.~~ In addition, there is a provision directed toward preventing human disturbance to bat caves by keeping cave locations confidential. These conservation measures are substantially greater than what occurs under the No Action alternative.

pg. 4-437 and 4-438 - change paragraph under heading Alternative C:
...In concert, these strategies should ensure the development of large contiguous landscapes of ~~mature and~~ sub-mature to old-growth forest containing large trees and snags. In addition, talus fields, cliffs, and caves would be protected as described in HCP Chapter IV, Section F and in this document, Appendix 3, Chapter IV, Section F, and live trees or snags that are known to be used by myotis bat species as communal roosts or maternity colonies would not be harvested. Under Alternative C, very large long-lived trees would also be retained, as part of the snag and green tree retention strategy, providing potential suitable snags for maternal roosts in the future. ~~In addition, there is a provision directed toward preventing human disturbance to bat caves by keeping cave locations confidential~~ The snags protected and green trees provided in this latter conservation measure would ensure that potential roost sites would be available now and in the future. ~~These conservation measures are greater than what occurs under the No Action alternative~~ In addition, there is a provision directed toward preventing human

disturbance to bat caves by keeping cave locations confidential. These conservation measures are substantially greater than what occurs under the No Action alternative.

pg. 4-438 - change paragraph under heading OESF Alternative 2:
...In addition, talus fields, cliffs, and caves would be protected as described in HCP Chapter IV, Section F and Appendix 3, Chapter IV, Section F in this document, as well as very large long-lived trees. Live trees or snags that are known to be used by myotis bat species as communal roosts or maternity colonies would not be harvested, and potential future roosts would be available through the snag and green tree retention strategy described in Alternative B...

pg. 4-439 - change first paragraph:
...In addition, talus fields, cliffs, and caves would be protected as described in HCP Chapter IV, Section F and Appendix 3, Chapter IV, Section F in this document, as well as very large long-lived trees. Live trees or snags that are known to be used by myotis bat species as communal roosts or maternity colonies would not be harvested, and potential future roosts would be available through the snag and green tree retention strategy described in Alternative B...

pg. 4-440 - change paragraph under heading Alternative A:
~~Given that the spotted bat in Washington occurs exclusively east of the Cascade mountains, only the spotted owl strategies designed for the east-side planning units have the potential to provide or protect the roosting and foraging habitat for this species.~~ Current management activity for the spotted owl under the No Action alternative is expected to provide no guaranteed protection of roosting or foraging habitat for the spotted bat. Roosting and foraging habitats as described above (excluding sagebrush communities) may be encompassed within the suitable owl habitat maintained within owl circles, however, these habitats would only be protected incidentally ~~under each of the proposed options~~.

pg. 4-442 - change paragraph under heading Alternative B:
...This would provide protection for pure white oak stands, and for some ponderosa pine stands where white oak is a significant component. This conservation measure includes retention of all very large dominant oaks, and maintaining 25 to 50 percent canopy cover in areas where partial harvest is conducted. These forests occur in the Columbia Gorge, and on the east slope of the southern Washington Cascades...

pg. 4-443 - change paragraph under heading Alternative B:
The combination of the riparian and spotted owl conservation strategies should provide forest conditions suitable for fisher breeding, foraging, and resting habitat. In concert, these strategies should ensure the development of large contiguous landscapes ~~of~~ of sub-mature ~~and~~ to old-growth forest, as well as closed canopy forests of different seral stages. In areas managed for spotted owl breeding habitat, at least 50 percent of the NRF management areas in each WAU would be sub-mature or higher quality habitat. The high quality habitat would have old-growth forest characteristics which should provide ~~an adequate amount of~~ some large trees, snags and downed logs to function as fisher habitat. In total, 40-42 percent of the area managed for spotted owl breeding habitat would be

~~mature or~~ sub-mature to old-growth forest. In the west-side planning units, the spotted owl strategy designates 117,000 acres to be managed as spotted owl dispersal habitat. At least 50 percent of the Dispersal management area in each WAU would meet the minimum specifications for spotted owl dispersal habitat (HCP Chapter IV). The purpose of dispersal habitat is to support the movement of juvenile spotted owls between sub-populations on federal reserves, and it is likely the availability of this habitat may enhance the survival of dispersing juvenile fishers. ~~Large, old trees would be specified for retention as part of the leave tree requirement of Washington Forest Practices Rules.~~ Most of the owl habitat provided on DNR-managed lands would be at elevations less than 3,300 feet (1000 meters), ~~because that's where their ownership lies,~~ and, thus, ~~this habitat~~ would likely benefit fishers. Large, old trees would be specified for retention as part of the snag and leave tree strategy of this alternative that provides three snags and five green trees per acre harvested. Preference would be shown for hard snags with bark and snags at least 40 feet high. One of the green trees must be from the largest diameter size class in the harvested unit. These provisions would protect current potential fisher den sites as well as provide potential future den sites. Under Alternative B, DNR would conduct no activity that would appreciably reduce the likelikhood of denning success within 0.5 mile of a known active fisher den between February 1 and July 31 in areas managed for spotted owl breeding habitat ~~that would appreciably reduce the likelihood of denning success~~.

pg. 4-443 and 4-444 - change paragraph under heading Alternative C:
The combination of the riparian and spotted owl conservation strategies should provide forest conditions suitable for fisher breeding, foraging, and resting habitat. In concert, these strategies should ensure the development of large contiguous landscapes of ~~mature and~~ sub-mature to old-growth forest. In areas managed for spotted owl breeding habitat, at least 60 percent of the NRF management areas in each WAU would be sub-mature or higher quality habitat. The high quality habitat would have old-growth forest characteristics which should provide ~~an adequate amount of~~ some large trees, snags and downed logs to function as fisher habitat. Forest management would create a range of habitat types from grass-forb to late-successional forest which should provide habitat suitable for foraging and den sites. ~~Large, old trees would be specified for retention as part of the leave tree requirement of the Washington Forest Practices Rules.~~ Most of the owl habitat provided on DNR-managed lands would be at elevations less than 3,300 feet (1000 meters), ~~because that's where their ownership lies~~, and, thus, ~~this habitat~~ would likely benefit fishers. Alternative C provides the same snag and green tree retention, seasonal den site protection, and road management plan as Alternative B, thus, the protection would be the same. ~~Under Alternative C, DNR would conduct no activity within 0.5 mile of a known active fisher den between February 1 and July 31 in areas managed~~ The additional conservation measures for ~~spotted owl breeding habitat that would appreciably reduce the likelihood of denning success~~ fishers would be greater under Alternative C than under Alternative A. ~~Road closures on DNR-managed lands would occur, consistent with cost-effective forest management and the policy set forth in the Forest Resource Plan. Under this policy, DNR would cooperate with the Services to restrict road access to protect sensitive wildlife habitat. Although this policy is the same as under Alternative A, additional conservation measures for fishers would be greater under Alternative C than under Alternative A.~~

pg. 4-444 - change paragraph under heading OESF Alternative 2:
...Special provisions for the retention of large, old trees, snags and green trees, and protection of known den sites would be the same under this alternative as in Alternatives B and C above...

pg. 4-445 - change first paragraph:
...This strategy, and the riparian strategy described in Alternative 2 above, would likely ensure that an adequate amount of downed logs and snags suitable for fisher den sites are available in the owl concentration areas. ~~Some management may occur in the outer portion of~~ There would not be a distribution of owl habitat throughout the ~~stream buffers and in~~ OESF and therefore, fisher habitat outside the ~~wetland buffers around forested wetlands, however, these strategies would likely retain some suitable snags for fishers and contribute to protection of potential foraging~~ riparian areas would be patchy. Some management may occur in the outer portion of the stream buffers and in the wetland buffers around forested wetlands, however, these strategies would likely retain some suitable snags for fishers and contribute to protection of potential foraging areas. Special provisions for the retention of large, old trees, snags and green trees, and protection of known den sites, would be the same under this alternative as in Alternatives B and C above. This protection and maintenance of potential fisher habitat is guaranteed and substantially greater than that provided under OESF Alternative 1.

pg. 4-445 - change paragraph under heading Alternative B:
...The combination of the riparian and spotted owl conservation strategies should ensure the development of large contiguous landscapes of ~~mature and~~ sub-mature to old-growth forest that would provide forest conditions suitable for some wolverine breeding, foraging, and resting habitat...

pg. 4-446 - change paragraph under heading Alternative C:
...The combination of the riparian and spotted owl conservation strategies should ensure the development of large contiguous landscapes of ~~mature and~~ sub-mature to old-growth forest that would provide forest conditions suitable for some wolverine breeding, foraging, and resting habitat...

pg. 4-449 - delete second and third heading and second paragraph:
~~**Analysis of Effects of HCP Alternatives on Federally Listed, proposed, and Candidate Plant Taxa**~~

~~**Plants of concern at the Federal Level**~~
~~Species that are of concern at the federal level include those that are listed under the federal ESA, those that are proposed for listing under the ESA, and those that are candidates for listing under the ESA~~

pg. 4-449 - delete the footnote entirely

4.5.3 Endangered, Threatened and Sensitive Plant Species

pg. 4-449 - change last paragraph on page:
...The only known extant site in the world is found in a brackish wetland in California. ~~There are no NRF or Dispersal management areas in proximity to suitable habitat for this species; however, this species would~~ However, this species could occur in wetlands ~~and in areas covered by marbled murrelet protection measures~~ near the Pacific Coast, Willapa Bay, or Puget Sound. HCP Alternatives B and C and ~~the~~ OESF ~~a~~Alternatives 2 and 3 would likely provide better protection of this species' habitat than would the No Action alternatives (HCP Alternative A and OESF Alternative 1) because of their better overall riparian and wetland protections.

pg. 4-450 - change the first paragraph on page:
Castilleja levisecta. Golden paintbrush occurs from Thurston County northward to Vancouver Island. Historically it was also known to occur in the Willamette Valley in Oregon and in Clark County, Washington. The species is restricted to grasslands and areas dominated by a mixture of grasses and shrubs. ~~There are only 10 known sites in the world, eight of which are in Washington.~~ Although this species occurs in grasslands, it could be affected by timber harvest through road building, yarding, or decking logs on adjacent grasslands. Where conifers invade *C. levisecta* habitat, the removal of trees is beneficial to the species. There are only 10 known sites with *C. levisecta* in the world, eight of which are in Washington and one of these is a DNR-managed Natural Area Preserve. All sites are quite small in area and are subject to a variety of threats, the most serious of which is the invasion by a mixture of Douglas-fir, Scot's broom, blackberries, and roses. It is not known to occur, nor is it expected to occur within the Olympic Experimental State Forest. ~~This taxon is not known to occur, nor is it expected to occur, in NRF or Dispersal management areas. It is also not known to occur, nor is it expected to occur within the Olympic Experimental State Forest.~~ There is little to no DNR-managed land adjacent to sites that harbor this species. The HCP alternatives are not expected to have any effect on this species. ~~Although this species occurs in grasslands, it could be affected by timber harvest through road building, yarding, or decking logs on adjacent grasslands. If conifers were to invade grassland habitat, removal of those trees could be beneficial.~~

pg. 4-450 - change first full paragraph:
Howellia aquatilis. Water howellia is an aquatic annual generally found in vernal ponds or portions of ponds in which there is a significant seasonal draw down of the water level. All ponds known ~~ponds~~ to contain this species have a deciduous tree component around their perimeters; most have conifers as well. The species is currently known to occur in Washington, Idaho, and Montana. In Washington, it has been found in Clark, Pierce and Spokane Counties. Historically it was also known to occur in Thurston and Mason Counties, as well as in Oregon and California. ~~This taxon is not known to occur in NRF or Dispersal management areas. Because there has been no inventory of water howellia on DNR-managed lands, possible impacts to this species are unknown under the HCP. If water howellia does occur in the planning area, HCP Alternatives B and C would have~~

~~fewer adverse effects on this species than the No Action alternative because these alternatives offer better overall wetlands protection and possible deferrals and protections for marbled murrelets.~~ There has been no inventory of water howellia on DNR-managed lands, but if water howellia does occur in the planning area, then HCP Alternatives B and C would have fewer adverse effects on this species than the No Action alternative because these alternatives offer better overall wetlands protection and possible deferrals and protections for marbled murrelets.

pg. 4-450 - change second full paragraph:
Lomatium bradshawii. Bradshaw's lomatium was thought to be endemic to the Willamette Valley in Oregon until 1994, when it was discovered in Clark County, Washington. The one site in Washington is a seasonally flooded wetland dominated by grasses, sedges and rushes. As far as is now known within the HCP planning area, this species is restricted to wetlands in flood-plain habitats at low elevations in the Columbia Planning Unit. ~~No NRF or Dispersal management areas occur in close proximity to a suitable habitat for this species.~~ Although not known to occur on DNR-managed lands, some DNR-managed lands may provide potential habitat. ~~However, there is expected to be no difference between the various alternatives in terms of their potential impacts on~~ HCP Alternatives B and C would likely provide better protection of this ~~species~~ species' habitat than would the No Action alternative because of their better overall wetland and riparian protections. The OESF alternatives would have no effect, as the species is not known or expected to occur in the planning unit.

pg.4-450 - change last paragraph on page:
Sidalcea nelsoniana. Nelson's checkermallow was also thought to be restricted to Oregon until relatively recently. There are known sites in Cowlitz and Lewis Counties, Washington. These sites are in low elevation, moist meadows within the South Coast and Columbia HCP planning units. ~~It is not known to occur in NRF or Dispersal habitat management areas and is not likely to occur within close proximity to any such identified lands. However, known sites are within areas that would be subject to marbled murrelet protection measures, and the~~ These sites may qualify as wetlands. There is a limited amount of DNR-managed land that contains suitable habitat...

pg. 4-451 - change first full paragraph:
~~In addition to the above, there are a number of vascular plant taxa~~ There is one vascular plant species that ~~are candidates~~ is a candidate for listing (as of ~~September 1993~~ February 1996) under the federal ESA which ~~are~~ is known to occur, or ~~are~~ is reasonably suspected of occurring, within the HCP planning area. ~~Those species are listed below and in Table 4.5.6.~~ Additional information about ~~these~~ this species can be obtained from DNR's Natural Heritage Program.

pg. 4-451 - add new second paragraph (Note: this will be the only species listed under heading Federal candidate vascular plant species.)**:**
Sidalcea oregana* var. *calva. This taxon is restricted to the Chelan Planning Unit. It may occur on DNR-managed forest land. It can occur along small riparian areas and some of the sites would qualify as wetlands. Alternatives B and C can be expected to provide better protection than the No Action alternative due to the overall better riparian

zone and wetlands protections. The OESF alternatives would have no effect since ~~the~~ taxon is not known or expected to occur on the OESF.

pg. 4-451 - add new heading and new paragraph <u>before</u> paragraph with subhead *Aster curtus*:

Plant species of concern

There are a number of vascular plant taxa that are species of concern to the U.S. Fish and Wildlife Service (as of February 1996) which are known to occur, or are reasonably suspected of occurring, within the HCP planning area. Those species are listed below and in Table 4.5.6. Additional information about these species can be obtained from DNR's Natural Heritage Program.

pg. 4-451 - change second full paragraph:

Aster curtus. This taxon is restricted to grassland habitats in the lowlands of the Puget trough. It ~~is not known to occur, nor is it expected to occur,~~ may occur in ~~NRF or Dispersal management areas and it is not known nor expected to occur on the OESF~~ grasslands adjacent to DNR-managed forest land. It is not known nor expected to occur on the OESF. Because the plant is generally restricted to nonforested habitats, the HCP alternatives and the OESF alternatives are expected to have ~~no~~ little effect on this species.

pg. 4-451 - change third full paragraph:

Astragalus pulsiferae* var. *suksdorfii. In Washington, this taxon is restricted to the Klickitat Planning Unit and occurs in somewhat open ponderosa pine stands with a relatively sparse understory. One ~~location is within an area identified as spotted owl dispersal habitat. The No Action alternative may provide better habitat protection for this taxon than HCP Alternatives B and C due to higher harvest levels~~ known site of *A. pulsiferae* is on DNR-managed land designated as a Dispersal habitat management area. An alternative with higher harvest levels may provide better habitat protection for this taxon than an alternative with lower harvest levels. However, increased harvest levels may not be a recommended method for enhancing the habitat for this taxon; prescribed burns, or allowing natural fires to burn, would likely be a preferable method. The OESF alternatives would have no effect, as the taxon is not known or expected to occur on the OESF.

pg. 4-451 - change fifth full paragraph:

Calochortus longebarbatus* var. *longebarbatus. In Washington, this taxon is restricted to the Klickitat Planning Unit. It could occur on DNR-managed lands. It occurs primarily in open grasslands, but occasionally extends into open forest stands. Within the Yakama Indian Reservation, it can be found within harvested units and along roadway openings. ~~It is not known to occur in any NRF or Dispersal management areas.~~ Although this taxon could benefit from timber harvest in areas adjacent to meadow openings, it is anticipated that there is no effective difference between Alternatives B and C and the No Action alternative. The OESF alternatives will have no effect since the taxon is not known or expected to occur on the OESF.

pg. 4-451 - change last paragraph on page:
Cimicifuga elata. This taxon occurs in DNR Dispersal management areas and potentially within NRF management areas. ~~Several non-DNR sites would meet the criteria for NRF management areas under either Alternative B or Alternative C.~~ The taxon occurs within the North Coast, Straits, South Puget, South Coast, and Columbia planning units. HCP Alternatives B and C are expected to be more beneficial than the No Action alternative due to the lower timber harvest levels of the former in NRF and Dispersal management areas. The OESF alternatives would have no effect, since the taxon is not known or expected to occur on the OESF.

pg. 4-452 - change first paragraph:
Corydalis aquae-gelidae. This taxon occurs primarily along Type 3 through 5 Waters, including small seeps, and is restricted to the Columbia Planning Unit. It ~~is not currently known to~~ could occur ~~in any NRF or Dispersal management areas~~ on DNR-managed lands. HCP Alternatives B and C can be expected to provide better protection than the No Action alternative due to the overall better riparian zone protections.

pg. 4-452 - change second paragraph:
Cypripedium fasciculatum. This taxon occurs within a variety of coniferous stands within the Klickitat, Yakima, and Chelan planning units. ~~Although it is not known to~~ It could occur on DNR-managed lands ~~that have been identified as either NRF or Dispersal management areas, it does occur on lands of other ownership that meet the definitions for NRF and dispersal habitat~~. There is insufficient information available regarding this species' response to timber harvest activities to evaluate the alternatives and their respective effects.

pg. 4-452 - change third paragraph:
Delphinium leucophaeum. This taxon is essentially a grassland species and is restricted to the South Coast Planning Unit. It ~~is not known to occur, nor is it expected to occur, in NRF or Dispersal management areas~~ could occur on DNR-managed lands. The HCP alternatives are expected to have no effect on this species. The OESF alternatives would have no effect since the taxon is not known or expected to occur on the OESF.

pg. 4-452 - change fourth paragraph:
Delphinium viridescens. This taxon is restricted to the Chelan and Yakima planning units. It may occur ~~within NRF and Dispersal management areas~~ on DNR-managed lands. It can occur along small riparian areas and some of the sites would qualify as wetlands...

pg. 4-452 - change fifth paragraph:
Dodecatheon austrofrigidum. ~~This taxon is not known to occur in NRF or Dispersal management areas.~~ In Washington, ~~it~~ this taxon is currently known ~~only~~ to occur only in the Mt. Colonel Bob Wilderness Area of the Olympic National Forest...

pg. 4-452 - change sixth paragraph:
Erigeron howellii. In Washington, this taxon is restricted to the Columbia Planning Unit. It ~~occurs within both NRF and Dispersal management areas,~~ generally occurs in open

areas. Canopy removal is not expected to have a negative impact, but ground-disturbing activity might. There is insufficient information to analyze which alternative would be the best for this species. The OESF alternatives would have no effect since the taxon is not known or expected to occur on the OESF.

pg.4-453 - change first paragraph:
Filipendula occidentalis. In Washington, this taxon is restricted to river and creek banks in southwest Washington, in the Columbia and South Coast HCP planning units. ~~Although it is not known to occur in either NRF or Dispersal management areas, some~~ Some DNR-managed land is relatively close to known sites for this taxon. It is expected that HCP Alternatives B and C could provide more protection than the No Action alternative ~~due to deferrals and~~ because of their better riparian protections ~~for the marbled murrelet~~. ~~Should the species be found on NRF or Dispersal management areas, the increased riparian~~ The deferrals and protections for the marbled murrelet provided by HCP Alternatives B and C could also benefit this species. The OESF alternatives ~~would~~ should have no effect since the taxon is not known or expected to occur on the OESF.

pg. 4-453 - change second paragraph:
Hackelia venusta. This taxon is restricted to the Chelan Planning Unit. All known sites are on USFS lands. Some DNR-managed land ~~identified as NRF management areas~~ occurs within the range of this species. Canopy removal would not have a negative impact and in fact might be beneficial...

pg. 4-453 - add new third heading and new third paragraph:
Lathyrus torreyi. This taxon was thought to be extirpated from the state of Washington. The historic locations were scattered in Clark and Pierce Counties. The only extant site is at McChord Air Force Base, where it inhabits a mature conifer stand with an open understory. Timber management on DNR-managed lands under the HCP and OESF alternatives is unlikely to have an adverse effect.

pg. 4-453 - change third paragraph:
Lomatium suksdorfii. In Washington, this taxon is restricted to the Klickitat Planning Unit. It may occur ~~within spotted owl dispersal habitat~~ on DNR-managed lands. It can occur within riparian areas, but it is not restricted to such areas. It occurs on slopes that may support scattered individual conifers, on the edges of conifer stands, or in stand openings...

pg. 4-453 - change fourth paragraph:
Lupinus sulphureus* var. *kincaidii. This taxon is essentially a grassland species and, in Washington, is restricted to the South Coast Planning Unit. It is ~~not known or expected~~ unlikely to occur ~~in NRF or Dispersal management areas~~ on DNR-managed lands. The HCP alternatives are expected to have no effect on this species. The OESF alternatives are expected to have no effect since the taxon is not known or expected to occur on the OESF.

pg. 4-453 - change fifth paragraph:
Meconella oregana. This taxon occurs in grasslands, sometimes adjacent to forested areas, although generally in somewhat savannah-like conditions. ~~It is not known nor expected to occur in NRF or Dispersal management areas.~~ It is expected that there would be no difference between the HCP alternatives in terms of their effects on this taxon. The OESF alternatives would have no effect since the taxon is not known or expected to occur on the OESF.

pg. 4-453 - change sixth paragraph:
Mimulus jungermannioides. This taxon was historically known to occur in the Klickitat Planning Unit, but is currently thought to be extirpated from the state of Washington. It is restricted to seepage areas in exposed basalt. It is ~~not known~~ unlikely to occur ~~in NRF or Dispersal management areas~~ on DNR-managed lands. The HCP alternatives are not expected to have any impact on this taxon. The OESF alternatives would have no effect since the taxon is not known or expected to occur on the OESF.

pg. 4-453 - change last paragraph on page:
Penstemon barrettiae. This taxon occurs primarily on exposed basalt in Washington and is known to occur only in the Klickitat Planning Unit. It ~~is not known to occur in NRF management areas, although some~~ may occur ~~within Dispersal management areas~~ on DNR-managed lands. It may occur within riparian areas, although it is not restricted to riparian zones...

pg. 4-454 - delete entire first full paragraph

pg. 4-454 - change second full paragraph:
Silene seelyi. This taxon is restricted to cracks in exposed rock in a small portion of the Chelan, and possibly ~~maybe~~ the Yakima, planning units. Although it is not known to occur on DNR-managed lands, some DNR-managed lands ~~identified as NRF management areas~~ are in close proximity to known locations for this species...

pg. 4-454 - change third full paragraph:
Sisyrinchium sarmentosum. In Washington, this taxon is restricted to the Klickitat Planning Unit. It ~~occurs in moist meadows and small forest openings~~ may occur on DNR-managed lands. It ~~may occur within parcels identified as Dispersal management areas~~ occurs in moist meadows and small forest openings, and it may ~~be~~ occur within riparian and/or wetland areas...

pg. 4-454 - change fourth full paragraph:
Sullivantia oregana. In Washington, this taxon is known only to occur in the Columbia Planning Unit and occurs within waterfall spray zones and seepage areas. ~~It does occur within owl Dispersal and/or NRF management areas. HCP Alternatives B~~ A site with *S. oregana* is located in a DNR-managed Natural Area Preserve, and ~~C are expected to provide better protection than the No Action alternative because of their reduced harvest levels which would better maintain hydrologic flow to the habitat~~ other sites may occur in DNR-managed parcels adjacent to the preserve. HCP Alternatives B and C are expected to provide better protection than the No Action alternative because of their better riparian

and wetland protections. The OESF alternatives would have no effect since the taxon is not known or expected to occur on the OESF.

pg. 4-454 - change last paragraph:
Trifolium thompsonii. This taxon is only known ~~only~~ to occur in the Chelan Planning Unit. It is a grassland species, but it also occurs on the edge of forest stands. Fire is important in maintaining its habitat. This species is known to occur on DNR-managed lands.~~, but none have been identified as NRF or Dispersal management areas~~. There is expected to be no difference between HCP Alternatives B and C and the No Action alternative. The OESF alternatives would have no effect since the taxon is not known or expected to occur on the OESF.

pg. 4-458 - change heading of first paragraph:
~~Listed, proposed listed, or candidate~~ Plant taxa of ~~little~~ concern to the U.S. Fish and Wildlife Service in the HCP planning area that are highly unlikely to be affected

pg. 4-458 - change third paragraph:
Artemisia campestris ssp. *borealis* var. *wormskioldii*. This taxon is restricted to areas immediately adjacent to the Columbia River in Grant and Klickitat Counties. The areas do not support conifers and are far enough removed from ~~spotted owl habitat~~ DNR forest management that management ~~of that habitat is~~ activities are not likely to have any impact.

pg. 4-459 - change third paragraph:
Lomatium tuberosum. This taxon ~~does not occur on DNR-managed lands that have been identified as either NRF or Dispersal management areas. It~~ is restricted to talus slopes, mostly in nonforested areas, although there can be trees adjacent to the talus. Within the HCP planning area, this taxon is known only from the Yakima Planning Unit.

pg. 4-459 - change fourth paragraph:
Petrophytum cinerascens. This taxon ~~is~~ occurs just within the ~~very~~ eastern edge of the Chelan Planning Unit~~, but it does not occur within NRF or Dispersal management areas. In fact, it~~ and is restricted to rock outcrops adjacent to the Columbia River.

pg. 4-459 - delete entire fifth paragraph

pg. 4-459 - change last paragraph:
Tauschia hooveri. This taxon is restricted to lithosolic, nonforested habitats. It ~~occurs mostly east of the HCP planning area, although some sites are within the Yakima and perhaps the Klickitat planning units. It does~~ is known to occur on DNR-managed ~~lands, but not on lands identified as either NRF or Dispersal management areas~~ land. It occurs mostly east of the HCP planning area, although some sites are within the Yakima and perhaps the Klickitat planning units.

4.5.4 Habitat-Based Assessment of Other Fish and Wildlife Resources

pg. 4-465 - change second paragraph:
...The primary assumption with regard to impacts to these other species is that if adequate amounts of habitat of sufficient quality are provided and other factors do not preclude the use of that habitat, then these species will persist. The question is whether the combination of the described protective measures, natural diversity within the habitats on DNR-managed lands, and the diversity of treatments to be implemented under each of the alternatives would provide a sufficient amount of habitat...

pg. 4-464 - change last paragraph:
...Some species may be much more restrictive in their use of habitats and may depend upon only specific types of habitats within the coarse categories discussed in this section. For instance, some species are not only reliant on wetlands, but on those wetlands classified as bogs. As much as possible, forested habitats were divided according to forest structure and composition in a way that should be meaningful to forest-dwelling wildlife. Age classes of forested habitats were used as a surrogate for structure and composition in making estimates for this assessment. Conifer-dominated forests were classified as structurally complex forest (including fully functional forest and interior forest); closed-canopy forest; dense pole forest; regeneration forest; open~~, multi-aged~~ forest;~~ regeneration forest;~~ and, on the east side, open, multi-aged forest. Other categories are wildlife trees, wetlands, riparian areas, aquatic habitats, caves, cliffs, talus rock, oak woodlands, prairies, subalpine and alpine habitats, and other habitats.

pg. 4-466 - change paragraph under heading Assumptions necessary to facilitate comparisons:
Several assumptions were necessary to fill gaps in available data and the lack of details in some prescriptions. Actions under the alternatives are variable. This is particularly true under the No Action alternative because there is no guarantee that those actions will be conducted. ~~Several of the assumptions necessary to facilitate comparison are discussed below.~~

pg. 4-466 - delete subparagraphs 1 and 2 entirely

pg. 4-466 - change subparagraph 3:

> ~~3.~~ Although there ~~are~~ is considerable ~~amounts of~~ uncertainty associated with the No Action alternative, some aspects were relatively more certain. It is assumed, for instance, that DNR would continue to honor the Hoh Agreement (Hoh Tribe and DNR 1993) regarding protection of riparian areas within portions of the OESF. In all alternatives, protection of unstable slopes was assumed to result in older forest. However, many of these areas might not be capable of supporting trees long enough to develop old-forest conditions and some unstable slopes might be harvested once appropriate techniques or knowledge are available. Further, some harvest may actually reduce the risk of failure on some slopes.

pg. 4-467 - change last sentence of paragraph under heading Structurally Complex Forests:
...Species using this habitat category range from the Johnson's hairstreak butterfly to the northern ~~spotted owl~~ goshawk.

pg. 4-467 - add to paragraph under heading East-Side Planning Units:
East-side forest habitats are not described in terms of age classes. Uneven-aged stands comprise the majority of east-side stands and conditions are described in more qualitative terms. Currently, 29 percent of DNR-managed lands on the east side are considered to be owl habitat (DEIS Table 4.3.5). Many 70-year-old stands may begin to approximate owl habitat on the east side of the Cascades where stands tend to be more diverse with regard to species and age composition.

pg. 4-468 - change first paragraph on page:
~~Recent application of DNR policies indicates that r~~ Riparian buffers may contribute to complex forests, but a review of recent applications of DNR policies indicates such treatments are not guaranteed. Unstable slopes may be deferred from harvest until more is learned about how these slopes can be managed without increasing the risk of mass wasting and erosion. It is ~~likely~~ possible that in the short term, and even in the long term to some degree, that unstable slopes will contribute somewhat to complex forests.

pg. 4-468 - change last sentence of paragraph under heading East-Side Planning Units:
...It is projected that at year 2096, 17 percent of the east-side lands ~~will~~ would be in NRF habitat.

pg. 4-468 - change first sentence of paragraph under heading OESF Planning Unit:
As described above, the No Action alternative would contribute complex forest as a result of owl and murrelet conservation, riparian buffers, and, to a lesser degree, unstable-slope protection...

pg. 4-468 - change first paragraph under heading West-Side Planning Units:
...As in the No Action alternative, complex forest would be provided as a result of owl conservation, marbled murrelet protection, and other actions ~~such as unstable-slope protection~~. The owl conservation strategy will only occur in designated landscapes under Alternative B. The goal for those designated landscapes is that 50 percent of the designated area (by WAU) be developed and maintained in foraging habitat...

pg. 4-469 - change first full paragraph:
...Those factors which are necessary to avoid ~~salmon~~ impacts to salmonid ~~and have been previously delineated (large woody debris, water temperature, sedimentation rates, and water quality)~~ would be maintained~~, which may incidentally maintain factors important to riparian and terrestrial species as well, but it is not certain~~. The protection afforded unstable slopes would be the same as presented under the No Action alternative.

pg. 4-469 - change second full paragraph:
Based on average rotations of 60 years (40-80 years), it could be expected that those stands which fall outside such areas would provide 0 percent (0-12 percent) complex forests. However, the older forests produced and maintained in riparian areas, murrelet sites, and other such areas would benefit from the protection provided by surrounding stands if those stands are of sufficient development to buffer the effects of sun, wind, and predators. The distribution of complex forests will be determined largely by the location of proposed NRF management areas and Dispersal management areas...

pg. 4-470 - change first paragraph under heading West-Side Planning Units:
Alternative C would resemble Alternative B with some exceptions. The NRF-management areas would have a goal of 60 percent NRF instead of 50 percent NRF. ~~It is not known how much additional habitat this would provide over the life of the plan in comparison to Alternative B.~~ This aspect of Alternative C may not result in ~~a~~ drastic short-term changes from Alternative B because many areas are habitat and habitat-growth limited. Eventually, there will be some increase observed in older forests. The main difference between Alternatives B and C would likely occur as a result of the additional 83,000 acres of west-side NRF management areas provided under Alternative C. ~~It can be assumed that these additional NRF areas would resemble the other NRF areas as predicted in Alternative B.~~

pg. 4-470 - change forth paragraph under heading West-Side Planning Units:
It is expected that Alternative C would provide greater amounts of complex forest than either Alternative A or B. Even if the 60 percent NRF goal resulted in no more complex forest, the approximately 83,000 acres of additional NRF management areas would likely result in ~~34 percent~~ more complex forest at year 2096. At year 2096, it is expected that 50 percent of DNR-managed lands in the west-side planning units (excluding the OESF) would be in this habitat category. It is also expected that 58 percent of the NRF management areas, 48 percent of the Dispersal management areas, and 49 percent of the remaining areas would be in complex forest.

pg. 4-471 - change first sentence under heading West-Side Planning Units:
Alternative C is expected to provide the most complex forest (~~34~~ 50 percent) followed by Alternative B (31 percent)...

pg. 4-474 - change first paragraph:
Under this alternative, some older forest is expected to occur in the 300-acre nest ~~groves~~ patches provided in the owl strategy during the research and transition phases of managing these sites. Most murrelet sites would be expected to eventually become older forest as would the 25-foot no-harvest riparian buffer and possibly even the 25- to 100-foot minimal-harvest zone.

pg. 4-474 - change second paragraph:
Based on DNR estimates, 12 percent of DNR-managed lands on the west side (excluding the OESF) would be in this habitat category at year 2096. This estimate includes riparian areas, unstable slopes, and murrelet sites, as well as nesting habitat provided for owls. The distribution of older forests will be determined largely by the location of ~~NRF~~

~~management areas and Dispersal management areas~~ the 20,400 acres of owl nesting patches. At year 2096, it is expected that 12 percent of the Dispersal management areas, 32 percent of the NRF management areas, and 9 percent of the remaining areas would be in older forest.

pg. 4-474 - change forth paragraph:
...In Alternative C, it would be expected that ~~greater than 12 percent, the amount that is expected under Alternative B, of the west side would be older forest at year 2096.~~ 25 percent of DNR-managed land in the west-side planning units (excluding the OESF) would be in this habitat category at year 2096. It is also expected that 31 percent of the NRF management areas, 24 percent of the Dispersal management areas, and 23 percent of the remaining areas would be in complex forest.

pg. 4-474 - change last paragraph on page:
This alternative contains an objective of 20 percent ~~of~~ forest with structure equivalent ~~in structure~~ to ~~those greater than 100 years in age~~, that normally found in forest at least 100 years in age, and it is likely that large portions of that 20 percent would be in this habitat category during the first 40-60 years...

pg. 4-475 - change paragraph under heading West-Side Planning Units:
It is estimated that Alternative A would provide more older forest (16 percent) than Alternative B (12 percent) or C (~~greater than 14~~ 25 percent), but this would not be guaranteed. It is likely that Alternative C would provide more than Alternative B based primarily on the 60 percent NRF target, the additional NRF management areas, and the higher habitat-quality standards.

pg. 4-476 - change second paragraph:
...Unstable slopes may be deferred from harvest until more is learned about how these slopes can be managed without increasing the risk of mass wasting and erosion. It is ~~likely~~ possible that in the short term, and the long term to some degree, unstable slopes will make some contribution to interior forests. However, many such slopes are incapable of growing or supporting older forests. The stage of forest development on these unstable slopes varies across the landscape. One common factor is that they are located adjacent to or nearby streams or seeps. Although we do not know the size or shape of these patches, adjacency to the riparian corridor system should compliment the forests found within those corridors.

pg. 4-477 - change first full paragraph:
This alternative, which would eventually supply 50 percent of significant landscape areas in owl habitat, would logically be expected to produce significant amounts of interior forest in those areas.

pg. 4-477 - change third full paragraph:
This alternative, which would eventually supply 60 percent of significant landscape areas in owl habitat or better, would logically be expected to produce significant amounts of interior forest in those areas.

pg. 4-480 - delete first full paragraph and replace with:
At year 2096, it is expected that 22 percent of DNR-managed lands in the west-side planning units (excluding the OESF) would be in this habitat category. It is also expected that 21 percent of the NRF management areas, 29 percent of the Dispersal management areas, and 21 percent of the remaining areas would be in closed canopy forest. More areas would be managed for NRF, and fewer would be managed as dispersal habitat.

pg. 4-480 - change paragraph under heading Alternative 2:
This alternative includes an objective that would maintain at least 40 percent of each landscape planning area as young forest marginal or higher quality habitat. Under this alternative, the harvest of stands younger than 100 years of age is distributed through time to strike a balance with regrowth. It is estimated that at year 2096, 5-10 percent of the OESF would be in closed forest.

pg. 4-480 and 4-481 - change next to last paragraph on page:
Little difference exists between alternatives. The No Action alternative might produce 29 percent closed-canopy forest at year 2096, but results under this alternative are highly variable. ~~It is uncertain to what degree Alternatives B and C would vary from one another.~~ It is estimated that Alternative B will contribute about 31 percent closed forest and that Alternative C will contribute about 22 percent.

pg. 4-481 add to first partial paragraph:
NRF management areas, 69 percent in the Dispersal management areas, and 58 percent in the remaining areas. In comparison, Alternative C would provide about 72 percent, with 78 percent of NRF management areas, 77 percent of Dispersal management areas, and 70 percent of the remaining areas.

pg. 4-481 - change second paragraph under heading Remarks Relative to Cumulative Effects:
Reduction in the amount and patch size of closed forests and older categories in certain landscapes (e.g., southwest Washington and the eastern portions of the Klickitat Planning Unit) may impact species utilizing contiguous forests such as the northern goshawk, and fragmentation and isolation may impact a number of low-mobility species.

pg. 4-483 - change paragraph under heading West-Side Planning Units:
Based on DNR estimates, 15-20~~-21~~ percent of DNR-managed lands on the west side (exclusive of the OESF) would be in this habitat category at year 2096. This estimate includes riparian areas, unstable slopes, and murrelet sites, as well as habitat provided for owls. Based on average rotations of 60 years (40-80 years), it could be expected that those stands which fall outside such areas would provide 33 percent (25-50 percent) dense pole forests. It is expected that there would be little difference between areas. For instance, at year 2096 under Alternative B, it is expected that dense pole forests would encompass 13 percent of NRF management areas, 16 percent of Dispersal management areas, and 23 percent of the remaining areas. At year 2096 under Alternative C, it is expected that dense pole forests would encompass 13 percent of NRF management areas, 10 percent of Dispersal management areas, and 18 percent of the remaining areas.

pg. 4-484 - change fifth paragraph:
...It is expected that there would be little difference between areas. For instance, at year 2096 under Alternative B, it is expected that regeneration forests would encompass 5 percent of NRF management areas, 8 percent of Dispersal management areas, and 12 percent of the remaining areas. At year 2096 under Alternative C, it is expected that regeneration forests would encompass 7 percent of NRF management areas, 7 percent of Dispersal management areas, and 8 percent of the remaining areas for an overall average of 8 percent. It is expected that species such as the snowshoe hare will find sufficient amounts of foraging habitat throughout the planning period.

pg. 4-485 - change last paragraph on page:
Based on DNR estimates, ~~5~~ 4-6 percent of DNR-managed lands on the west side (exclusive of the OESF) would be in this habitat category at year 2096. This estimate includes riparian areas, unstable slopes, and murrelet sites, as well as habitat provided for owls. Based on average rotations of 60 years (40-80 years), it could be expected that those stands which fall outside such areas would provide 17 percent (12-25 percent) open forests. It is expected that there would be some difference between areas. For instance, at year 2096 under Alternative B, it is expected that open forests would encompass 2 percent of NRF management areas, 6 percent of Dispersal management areas, and 7 percent of the remaining areas. At year 2096, under Alternative C, it is expected that open forests would encompass 3 percent of NRF management areas, 6 percent of Dispersal management areas, and 4 percent of the remaining areas. ~~These same trends are likely for all alternatives.~~

pg. 4-487 - change third subheading and paragraph under heading Wildlife Trees:
ALTERNATIVES B~~, C,~~ AND 2~~, AND 3~~
Alternatives B and 2 would employ a leave tree strategy which would focus on leaving at least two large trees per acre in harvested areas. This strategy would leave three snags per acre as well as three additional green recruitment trees per acre harvested. Large trees left in harvested units would be selected for characteristics important to wildlife and will provide habitat for many species which utilize openings. For example, bluebirds, violet-green swallows, kestrels, and Lewis' woodpeckers utilize snags and trees with cavities when they occur within and adjacent to open areas. Rufous hummingbirds utilize trees for nesting in very early stages of forest succession and rely on dense stems and foliage for nesting sites. Other species, such as sapsuckers, nuthatches, and flying squirrels would use snags once surrounded by forests of sufficient development. Greater experimentation regarding wildlife leave trees would be expected within the OESF. These alternatives should provide a much greater quality of leave trees and snags than the No Action alternative~~, but would not provide any additional snags~~.

pg. 4-487 - add a forth paragraph under heading Wildlife Trees:
ALTERNATIVES C AND 3
Alternatives C and 3 would employ a leave tree strategy which would focus on leaving at least two large trees per acre in harvested areas. Large trees left in harvested units would be selected for characteristics important to wildlife and will provide habitat for many species which utilize openings. For example, bluebirds, violet-green swallows, kestrels, and Lewis' woodpeckers utilize snags and trees with cavities when they occur within and adjacent to open areas. Rufous hummingbirds utilize trees for nesting in very early stages

of forest succession and rely on dense stems and foliage for nesting sites. Greater experimentation regarding wildlife leave trees would be expected within the OESF. These alternatives should provide a much greater quality of leave trees than the No Action alternative, but would not provide any additional snags.

pg. 4-488 - add to first partial paragraph:
...Snags would only be guaranteed in the short term (early seral stands) under Alternatives B and 2.

pg. 4-488 - change first full paragraph:
None of the other alternatives guarantee the provision of snags above current state regulations...However, a strategy which would provide clumps of leave trees and snags every 5 acres, such as proposed in Alternatives B and 2, would likely serve the needs of flying squirrels and other such species quite well. Flying squirrels are important prey species for several forest carnivores, including spotted owls. Important considerations with regard to wildlife are the amount, quality, and distribution of leave trees and snags. Vaux's swift, fisher, and marten require hollow snags which are often in short supply. Some species of trees, which rot more rapidly in the core leaving a structurally-sound shell surrounding a softer or hollow core, provide superior cavity-nesting opportunities for many species. Alternatives B and 2 will provide emphasis on the retention of these structures.

pg. 4-491 - change second paragraph:
Activities which may occur within the buffer will be addressed through adaptive management. ~~are very clear for~~ t~~T~~he management decisions for ~~inner portion of the buffer,~~ the no-harvest area (0-25 feet), ~~and~~ the minimal harvest area (25-100 feet), ~~in eight of the planning units. Management activities in the outer portion of the buffer~~ and the low harvest area (100 feet to the buffer's edge) ~~are less defined~~ will be developed to achieve the desired biological and economic conditions described earlier in this document. Alternative B would permit actions so long as there were no negative impacts to salmonid habitat, or current conditions are maintained. This would mean that water quality, sedimentation, temperature, and large woody debris would all be considered and management activity would be decided by DNR on a site-specific basis.

pg. 4-491 - change third paragraph:
~~Alternative B may have measurable impacts to some species, such as cavity excavators and cavity nesters. Alternative B allows removal within the inner buffer on a regular basis and thus allows the reduction in snag and cavity opportunities.~~ In addition to providing large woody debris, shade, and other characteristics desired for aquatic species, the goals of the riparian areas include providing snags, downed logs, cavities, and characteristics important to riparian wildlife. Riparian areas are important sources of cavities for certain species, such as cavity-nesting ducks (e.g., wood ducks, Barrow's golden-eye, hooded mergansers, and buffleheads).

pg. 4-491 - change sixth paragraph:
The action alternatives would provide substantially more riparian habitat protection than the No Action alternatives. The action alternatives may lack detail in the description of

potential actions to fully assess the impacts to all aquatic and terrestrial species at this time, but Alternative B establishes a process to ensure the necessary characteristics are achieved. None of the action alternatives specify the density and size of trees to remain...

pg. 4-494 - change third subheading and paragraph under Cliffs:
ALTERNATIVES B~~, C,~~ AND 2~~, AND 3~~
These ~~action~~ alternatives state that mining of rock from cliffs for road construction would be avoided ~~when materials can otherwise be reasonably acquired~~ when practicable, that an evaluation will be conducted to identify important wildlife features which may exist, and that site-specific prescriptions would be developed where appropriate.

pg. 4-494 - insert new forth subheading and paragraph under heading Cliffs:
ALTERNATIVES C AND 3
These alternatives state that mining of rock from cliffs for road construction would be avoided when materials can otherwise be reasonably acquired and that site-specific prescriptions may be developed.

pg. 4-494 - change paragraph under subheading Comparison Among Alternatives And Remarks Relative to Cumulative Effects:
Alternatives B and 2 provide for an assessment of wildlife values and establishing a site-specific plan when necessary to protect those values. The other action alternatives offer little additional protection over the No Action alternative. Unless species are present that would require additional actions (i.e., peregrine falcons), it is assumed that little protection would be provided unless it came at no economic cost. ~~Both of these~~ The action alternatives may contribute to maintaining most cliff areas intact. However, ~~none of the a~~ only Alternatives B and 2 address the maintenance of vegetation within and adjacent to cliff areas for the use of nesting birds or for the maintenance of shelter from the elements. All alternatives could result in some level of impact to cliff-dependent species.

pg. 4-495 - insert new second subheading and second paragraph on page:
ALTERNATIVES B AND 2
Alternatives B and 2 would provide a 100-foot buffer around talus fields over 1 acre in size (1/4 acre in some key areas). Talus fields would not incur any harvest; however, within the buffer, harvest might occur so long as it maintained 60 percent canopy coverage. In forested talus areas outside those buffers, harvest can occur so long as no more than 1/3 of the volume is removed during each rotation. Within talus fields and associated buffers, road building will be avoided, provided that the routing of roads around such areas can be accomplished in a practical manner that is consistent with other objectives of a comprehensive landscape-based road network plan. These buffers should help maintain the integrity and microclimate of the talus fields, as well as provide a supply of coarse woody debris.

pg. 4-495 - change subheading Alternatives B, C, 2 and 3 and related paragraph:
ALTERNATIVES ~~B, C, 2,~~ AND 3
These ~~action~~ alternatives would provide a 100-foot buffer around talus fields over 1 acre in size. Talus fields would not incur any harvest; however, within the buffer, a harvest of up to a third of the volume might occur during each rotation. ~~If that harvest occurred~~

~~frequently, such as once each decade, little shading and microclimate protection would remain and few snags or downed logs of any substantial size would be provided, which is important to species such as the Larch Mountain salamander. But, at a minimum, t~~ The talus field itself would not be harvested and, if it were capable of supporting large trees, it might provide shade and a supply of downed logs. Yarding would generally not disrupt talus under the action alternatives, yet there is no guarantee of how often or to what extent disruption might occur.

pg. 4-495 - change third paragraph:
It appears that talus-dependent species would be better off under the action alternatives than under the No Action alternative because the talus field itself would not be subject to timber harvest and yarding would often avoid talus fields. Alternatives B and 2 provide a forested buffer around talus fields as well as protection of forested talus. Disruption will be much less frequent under these alternatives. However, under Alternatives C and 3, it is unclear to what extent the nature of those habitats would be maintained for the long-term survival of species given the lack of certainty regarding disruption of the talus fields and the treatment of the immediately surrounding timber.

pg. 4-495 - change next to last paragraph on page:
...Removal of conifers would be especially beneficial on the west side of the Cascade ~~mountains~~ Range. ~~Although~~ Approximately 25 to 50 percent of the canopy coverage would be retained~~, much of this could be due to coverage by shrubs~~.

pg. 4-498 - change partial paragraph:
...These effects, however, are very much interrelated with the effects of local and landscape levels of cover. Some species are affected to a greater degree by road densities. Excessive road densities (greater than 1 mile per section) may also preclude use of those areas by grizzly bears. Direct mortality of many species also increases in proximity to open roads. Other species may be impacted in other ways. Dust accumulation near roads may inhibit necessary functions for some smaller animals. The use of herbicides, pesticides, and fertilizers may have impacts upon the usability of habitats for may species and may contribute to direct mortality as well. This will be particularly true for many invertebrates or for species dependant on sensitive broad-leaved plants. Additional impacts and exclusion from habitats may occur from activities which are unrelated to this plan. However, t~~T~~he expected impacts to reducing habitat availability are relatively similar under all alternatives.

4.6 Soil	No change
4.7 Air Quality	No change
4.7.1 Affected Environment	No change
4.7.2 Forest Management	No change
4.7.3 Alternatives	No change
4.8 Water Quality	No change
4.8.1 Affected Environment	No change
4.8.2 Evaluation	No change
4.9 Cultural Resources	No change
4.9.1 Affected Environment	No change

4.10 Economic Analysis of DNR's Habitat Conservation Plan

pg. 4-529 - change first line in first paragraph:
This section provides ~~a brief~~ an analysis of the economic impact of the proposed HCP alternatives on Washington's economy...

pg. 4-529 - change second paragraph:
...This analysis focuses on timber-related employment and employment income as ~~a~~ policy-relevant indicators of the HCP alternatives and their impacts on the region's economy.

pg. 4-529 change second paragraph under heading Economic Background:
Lumber and paper products are a significant component of the economy of the region west of the Cascades. ~~Table 4.10.1 summarizes this dependency through employment by sector statistics.~~ Regions near Seattle-Tacoma have denser populations and more diverse economies.

pg. 4-530 - change third paragraph:
...Competition from southern forests and imports, technological changes, and exhaustion of old-growth forests confronted the industry with new challenges (Schamberger et al. 1992). In the past, log production for export provided some "slack" in the production system.

pg. 5-530 change first paragraph under heading Methods:
~~Limitations of time and information restrict the sophistication of the economic analysis of the proposed alternative harvest schedules.~~ The U.S. Forest Service has developed a series of multipliers based on the number of jobs created and income generated by the harvest of 1 million board feet of timber. Any increase in harvest volume has a direct effect in the timber industry.

pg. 4-531 - change fourth paragraph:
Data provided by DNR are based on 10-year forecast periods. Sustainable harvest calculations suggest the volume of harvest by age class of trees. Annual harvest quantities are required for the multiplier analysis, so 10-year harvest totals were divided by 10. Actual annual harvests will vary because of weather, market conditions, and other events. Employment and income impacts are shown as a range of probable changes to demonstrate the degree of uncertainty about actual harvests.

pg. 4-531 - change paragraph under heading Results:
Tables 4.10.1 and 4.10.2 show the annual harvest levels and ~~the~~ associated employment and employment income impacts for each alternative analyzed. Estimated harvest levels for the alternatives are divided into two categories: expected and low. The expected harvest levels represent average annual harvest levels based on the projection of DNR-managed land harvest levels for the first decade (see Appendix 5 for a discussion of the assumptions used for the harvest analysis projections)...

pg. 4-532 - change first full paragraph:
Table 4.10.1 shows that total regional expected annual harvest levels under Alternative B would be 7.1 percent greater than under the No Action alternative. ~~This~~ Implementation of Alternative C would result in a ~~3.4~~ decrease of 16.3 percent ~~increase in timber-related employment~~ in annual harvest levels compared with the ~~region, other things being equal~~ No Action alternative. ~~Under low harvest levels, Alternative B would result in a 23.5 percent harvest increase over the No Action alternative, resulting in a 19.5 percent increase in timber-related jobs.~~ Under low harvest levels, Alternative B would result in a 23.5 percent harvest increase over the No Action alternative. Alternative C would result in a decrease of 3.4 percent.

pg. 4-532 - change last paragraph:
~~Table 4.10.2 shows annual harvest levels and timber-related employment by alternative and by planning area.~~ For expected harvest levels, the table shows that job impacts, based on percentage increases, would be concentrated in the east-side and OESF planning units. For the east-side planning units, ~~harvest levels and~~ timber-related employment and income would increase by ~~24.7 and 32.6~~ over 32 percent ~~respectively~~ for Alternative B compared with the No Action alternative. For the OESF Planning Unit, ~~both harvest levels and timber-related~~ employment and income under Alternative ~~2~~ B would increase by 42.9 percent. For the west-side planning units, harvest levels and employment would be similar under both Alternatives A and B.

pg. 4-533 - add after Table 4.10.2:
For low harvest levels, the OESF Planning Unit would have the highest percentage increase for employment and income under Alternative B when compared with the No Action alternative. The east-side planning units would have the next highest percentage increase, and the west-side planning units have the smallest increase.

Under the expected harvest projections, Alternative C would result in a decrease in timber-related employment and income for all three areas compared with the No Action Alternative. The west-side would experience a 21 percent decline in employment and income; the east-side about a 9 percent decline and the OESF a 38 percent decline. Under low harvest projections, the east-side would show a 5.4 increase in employment and income compared with the No Action Alternative; the west-side, a 9 to 10 percent decline in employment and income; and the OESF, about a 29 percent decline.

Overall, under expected harvest projections, Alternative B would result in a 3.4 and 3.0 percent increase in timber-related employment and associated income, respectively over the No Action alternative; Alternative C would result in a 22 percent decrease for both employment and income.

Under low harvest projections, Alternative B would result in an increase of 19 percent over the No Action alternative for both employment and income. Alternative C would decrease employment and income around 10 percent.

4.11 Cumulative Effects

pg. 4-536 - change item (3):
Large forest landowners and managers, in search of ways to resolve conflict among the many growing demands, will look increasingly toward processes that define a niche for their lands and will create specific, objectives-based plans to achieve them. ~~Since no forest land can do all things for all people, what contribution can be made on specific lands? And what mix of certainty and flexibility can be achieved?~~

pg. 4-537 - change first paragraph under subheading West-Side Planning Units:
Alternative B provides a landscape-level, habitat-based strategy for providing conservation in western Washington for a broad range of species and habitat types. The primary emphasis is on spotted owls, marbled murrelets, and riparian habitat;...

pg. 4-540 - change the end of the paragraph:
...Alternative C is more conservative than Alternative B in providing for greater certainty of conservation benefits. Alternative 3 is more conservative than Alternative 2 in applying an experimental approach to achieving a habitat-based strategy for integrating production and conservation.

5. List of Preparers (delete entire section and replace with)

Members of the Interdisciplinary Team (IDT)

Name	Contribution	Degree(s)
Carol Lee Gallaghar, DNR	NEPA/SEPA Coordinator DNR IDT Lead (9/93 to 12/95)	B.A., M.A. Environmental Policy
Chuck Turley, DNR	DNR IDT Lead (12/95 to present)	B.S., Wildlife Management and Conservation
Sue Trettevik, DNR	Interim DNR IDT Lead	B.A., Communications M.A., Anthropology
William Vogel, USFWS	USFWS IDT Co-Lead	B.S., M.S., Wildlife Management
Craig Hansen, USFWS	USFWS IDT Co-Lead	B.A., M.S., Wildlife Management
Steve Landino, NMFS	Fishery Biologist NMFS IDT Lead	B.A., Biology M.S., Fisheries Science
David Hirsh, USFWS	NEPA Program Analyst	B.A., J.D.
Matt Longenbaugh, NMFS	Fishereis Biologist	B.S., Marine Science
Paula Swedeen, DNR	Wildlife Biologist	B.S., Biology, M.A., Environmental Studies, Political Science
Scott Horton, DNR	Wildlife Biologist	B.A., M.A., Zoology; M.S., Wildlife Ecology
George Wilhere, DNR	Wildlife Biologist	M.S., Biomedical Engineering; M.S., Neurobiology; M.E.M., Conservation Biology
Jeff Cederholm, DNR	Natural Resource Scientist	B.S., M.S., Fisheries Biology

Specialists

(those with expertise utilized in the development of the EIS)

Name	Contribution	Degree
Bob Aulds, DNR	Silviculturist	
Lisa Beusan, DNR	EIS Document Production Coordinator (1/95 to 5/96)	
Richard Bigley, DNR	Silviculturist/Forest Ecologist	Ph.D., Forest Ecology
William Caudill, USFWS	Economist	Ph.D., Agricultural Economics

Name	Contribution	Degree
Rebecca Christie, DNR	Editorial Expertise	M.L.S.
Dave Dietzman, DNR	SEPA Expert	B.A., Natural Resource Mgmt.
John Gamon, DNR	Botanist	M.S., Biology
Thomas Hamer, Hamer Environmental	Wildlife Biologist	B.S., M.S., Biology/Ecology
Donald Hiller, DNR	Cartographer	B.A., M.S., Geography
Jim Hotvedt, DNR	Economist	Ph.D., Forest Economics/Mgmt.
Sabra Hull, DNR	Wetlands Specialist	B.A., Environmental Education
Jean Juengling, DNR	Cartographer	B.S., Geography, M.S., Resource Geography
Barbara Kivett, DNR	Asst. Document Coord (4/95 to 5/96) EIS Document Production Coordinator (5/96 to 10/96)	
Andrew Laughland, USFWS	Economist	Ph.D., Agricultural Economics
Fred Martin, DNR	Biometrics	Ph.D., Forestry
Steve Miller, DNR	GIS Applications Development	B.A., Geography
Cherylyn Petersen, DNR	Cartographer	B.S. Geography
Cheryl Quade, DNR	Wildlife Biologist	M.S., Wildlife Science
Katherine Reed, DNR	Editorial Expertise	M.S., Geology
Carole Richmond, DNR	Policy Analyst	M.S., Forest Resources
Ken Schlichte, DNR	Forest Soil Scientist	M.S., Forest Soils
Dena Scroggie, DNR	Printing and Graphics Expertise	B.A., Graphic Design
Susan C. Shaw, DNR	Geomorphologist	Ph.D., Geological Sciences
Blanche Sobottke, DNR	Printing Expertise	B. Landscape Architecture, B.S., Environmental Design
Lowell Thacker, DNR	GIS Analysis and Applications	B.A., Geography
Tim Walsh, DNR	Geologist	B.S., M.S., Geology
Tim Young, USFWS	GIS Specialist	B.S., Geography

The following individuals contributed to the development of the Environmental Impact Statement for the Habitat Conservation Plan. Team leaders are indicated by an asterisk.

Habitat Conservation Plan (HCP) Management Team

*Rick Cooper, *Project Director* (8/95 to present)
John Calhoun, *Project Director* (through 7/95)
Chuck Turley, *Science Team Leader*
Jane Lamensdorf-Bucher, *Environmental Planner*
Carol Lee Gallaghar, *NEPA/SEPA Coordinator*
Paula Swedeen, *Natural Resource Scientist*
George Wilhere, *Natural Resource Scientist*
Steve Miller, *GIS Specialist*
Bob Aulds, *Silvicultural Operations*
Lisa Beusan, *Project Coordinator*
Barbara Kivett, *Administrative Assistant*
Lowell Thacker, *GIS Specialist*

HCP Science Team

*Chuck Turley, *Natural Resource Scientist, DNR*
Jeff Cederholm, *Natural Resource Scientist, DNR*
Rex Crawford, *Plant Ecologist, DNR*
John Engbring, *Wildlife Biologist, USFWS*
Tom Hamer, *Wildlife Biologist, Hamer Environmental*
Dave Hays, *Spotted Owl Ecologist, WDFW*
Richard Holthausen, *National Wildlife Ecologist, US Forest Service*
Nancy Naslund, *Seabird Biologist, USFWS*
Martin Raphael, *Research Wildlife Biologist, US Forest Service*

Support to HCP Science Team

Kate Engel, *Consultant, Foster Wheeler Environmental*

HCP Internal Advisory Group

Kaleen Cottingham, *Department Supervisor*
Stan Biles, *Deputy Supervisor*
Jack Hulsey, *Forest Resources Division Manager* (prior to Spring 1996)
Terry Kirkpatrick, *Acting Forest Resources Division Manager* (since Spring 1996)
Bruce Mackey, *Resource Planning & Asset Management Division Manager* (prior to Summer 1996)
Michael Perez-Gibson, *Acting Resource Planning & Asset Managment Division Manager* (since Summer 1996)
Jerry Otto, *Policy Analysis & Research Division Manager*
Bonnie Bunning, *South Puget Sound Region Manager*
George Shelton, *Southeast Region Assistant Manager*

HCP Citizen Advisory Committee

Katherine Baril
Joel Kuperberg
Jeannette Lee (deceased in early 1995)
Les Purce (through 10/9/95)
Randy Scott

HCP Implementation Issues Committee

*John Baarspul
Phil Aust
Victor Boekelman
Bob Coon
Seth Mackie
Michael Perez-Gibson
Richard Ramsey
George Shelton
Clay Sprague
Lenny Young

Additional Input, Review, and Help

Michelle Balentine
Bill Barber
Amy Bell
Gary Berndt
Richard Bigley
Mary Ellen Birli
Steve Brown
Matt Brunengo
Nancy Charbonneau
Starla Colley
Lisa Egtvedt
Darrell Fields
Nonie Hall
Louis Halloin
Jim Hotvedt
Gerry Hoyer
Sabra Hull
John Keller
Bill Leonard
Deb Lindley
Dave Malsed
Connie Manson
Fred Martin
Diane Mitchell
Barbara Mix
Jim Peters
Luis Prado
Cheryl Quaid
Ken Russell
Jim Ryan
Teri Savage
Anne Sharar
Clay Sprague
Amy Stock
Ed Summerfield
Rex Thompson
Dave Vagt
Dave Wolfer

Nathan Schumaker, *UW College of Forest Resources*
Dan Varland, *Rayonier*

The following individuals contributed to the development of a plan for the OESF, parts of which were subsequently incorporated into the HCP. Team leaders are indicated by an asterisk.

Olympic Experimental State Forest Team
*Rick Cooper, *Project Director* (8/95 to present)
John Calhoun, *Project Director* (through 7/95)
Craig Partridge, *original Project Manager*
Richard Bigley, *Natural Resource Scientist*
Carol Lee Gallaghar, *NEPA/SEPA Coordinator*
Scott Horton, *Natural Resource Scientist*
Rich Hsu, *Olympic Region Assistant Manager*
Dave Johnson, *GIS Specialist*
Randy Mesenbrink, *Project Leader*
Susan C. Shaw, *Geomorphologist*
Sue Trettevik, *Natural Resource Program Specialist*
Al Vaughan, *Project Section Manager*
George Wilhere, *Natural Resource Scientist*
Lenny Young, *Natural Resource Scientist*

OESF Spotted Owl Conservation Planning Work Group
*Scott Horton, *Natural Resource Scientist, DNR*
Joe Buchanan, *Wildlife Biologist, WDFW*
John Engbring, *Wildlife Biologist, USFWS*
Craig Hansen, *Fish & Wildlife Biologist, USFWS*
Mark Ostwald, *Wildlife Biologist, WDFW*
Bill Vogel, *Fish & Wildlife Biologist, USFWS*
George Wilhere, *Natural Resource Scientist, DNR*

OESF Research and Monitoring Planning Work Group
*Lenny Young, *Natural Resource Scientist, DNR*
* Richard Bigley, *Natural Resource Scientist, DNR*
Robert Edmunds, *Professor, UW College of Forest Resources*
Craig Hansen, *Fish & Wildlife Biologist, USFWS*
John Pierce, *Research Program Manager, WDFW*

OESF Citizen Policy Review Committee
Carolyn Dobbs, *Chair, The Evergreen State College*
Dorothy Duncan, *Commissioner, Clallam County*
Gene Dziedzic, General Member
Jerry Franklin, *UW College of Forest Resources*
Vivian Lee, *Hoh Tribe, to 9/95,*
Mary Leitka, *Hoh Tribe, 10/95 to present*
Jill Mackie, *Pacific Lumber and Shipping*
Grant Munro, *industrial forestry*
Bert Paul, *Forks, Washington*
Charles Peterson, *Western Council of Industrial Workers*
Melanie Rowland, *Washington Environmental Council*
Jim Walton, *Washington State Wildlife Commission*
Vim Wright, *UW Institute for Environmental Studies*

OESF Science & Technical Advisory Group for Riparian Conservation Strategy
*Susan C. Shaw, *Geomorphologist, DNR*
Carol Bernthal, *Habitat Coordinator, Point No Point Treaty Council*
Richard Bigley, *Ecologist, DNR*
Chris Byrnes, *Habitat Manager, WDFW*
Ned Currence, *TFW Biologist, Makah Tribe*
Phil DeCillis, *Fish Biologist, USFS*
Jerry Gorsline, *Olympic Field Representative, Washington Environmental Council*
Scott Horton, *Wildlife Biologist, DNR*
Michael McHenry, *TFW Biologist, Lower Elwha S'Klallam Tribe*
Randy Mesenbrink, *Hoh District Manager, DNR*
Beth Naughton, *TFW Biologist, Quileute Tribe*
David Parks, *Hydrologist, DNR*
Ginger Phalen, *Wildlife Biologist, USFWS*
Warren Scarlett, *Fisheries Technician, DNR*
Joanne Schuett-Hames, *Water Quality TFW Coordinator, DOE*
Anne Shaffer, *Marine Biologist and Policy Analyst, Quileute Tribe*
Eric Shott, *TFW Coordinator, Northwest Indian Fisheries Commission*
William Traub, *Natural Resources Engineer, DNR*

Additional input from DNR Olympic Region staff:
Doug Ferris, Regional Engineer,
Rick Cahill, Dave Christiansen,and
Jim Closner, Field Foresters
Mark Johnsen, Ozette District Manager

6. Distribution List	No change
APPENDIX A - DNR's Forest Management	No change
APPENDIX B - Geology/Soils/Vegetation	No change
APPENDIX C - Calculating Juvenile Survival Rates and the Finite Rate of Change of the Spotted Owl Population on the Olympic Peninsula	No change
APPENDIX D - Methods for the Evaluation of Conservation Alternatives For Spotted Owl on the Oesf	No change
Glossary	No change

References

Add to the reference list:

Almack, J. A., W. L. Gaines, R. H. Naney, et at. 1993. North Cascades grizzly bear ecosystem evaluation: final report. Interagency Grizzly Bear Committee, Denver, CO. 156 p.

Bahls, P. And M. Ereth. 1994. Stream Typing error in Washington water type maps for watersheds of Hood Canal and the southwest Olympic Peninsula. Point No Point Treaty Council, Kingston, WA.

Compton, J. E., and D. W. Cole. 1991. Impact of harvest intensity on growth and nutrition of successive rotations of Douglas-fir. *In* W. J. Dyck, and C. A. Mees, eds. Long-term field trials to assess environmental impacts of harvesting: proceedings of the IEA/BE Workshop '90 (1990, Florida). Forest Research Institute, Rotorua, New Zealand. IEA/BET6/A6 Report no. 5. FRI Bulletin no. 161. p. 151-161.

Carey, A. B. 1995. Sciurids in Pacific Northwest managed and old-growth forests. Ecological Applications. v. 5, no. 3.

Carey, A. B., and M. L. Johnson. 1995. Small mammals in managed, naturally young, and old-growth forests. Ecological Applications. v. 5, no. 2.

Fraley, J. and B. Shepard. 1989. Life history, ecology, and population status of migratory bull trout (Salvelinus confluentus) in the Flathead Lake and River system, Montana. Northwest Science 63:133-143.

Franklin, J. F. 1989. Toward a new forestry. American Forests. v. 95, no. 11-12, p. 37- 44.

Franklin, J. F., and T. A. Spies. 1991. Composition, function, and structure of old-growth Douglas-fir forests. *In* L. F. Ruggiero, K. B. Aubry, A. B. Carey, M. H. Huff, tech. coords. Wildlife and vegetation of unmanaged Douglas-fir forests. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, OR. General technical report PNW-GTR-285. p. 71-82.

Irwin, L. L. 1993. Habitat conditions, wildfire risk, and demography of northern spotted owls in the eastern Cascade Mountains, Washington. National Council for Air and Stream Improvement, Inc. New York, NY. NCASI Special Report 93-04:20-23.

Irwin, L. L. , and S. K. Martin. 1992. Demography of spotted owls in managed and unmanaged forests on the east slope of the cascade mountains, Washington. National Council of the Paper Industry for Air and Stream Improvement. Annual Report.

Knight, C. A., and D. E. Seaman. 1995. Is northern spotted owl fecundity correlated with weather? Wildlife Society 2nd annual conference, Portland, OR, September 12-17, 1995. Poster presentation.

Marshall and Associates, Inc., and R. V. Quenet Consulting, Ltd. 1996. Task 1: Skagit area pilot project, final report, hardwood resources database project. [Prepared for] Washington Hardwoods Commission, Olympia. 7 p., plus appendices.

Mech, L. D. 1981. The wolf: the ecology and behavior of an endangered species. University of Minnesota Press, Minneapolis. 384 p.

Miller, D. J. 1995. Coupling GIS with physical models to assess deep-seated landslide hazards. Environmental & Engineering Geoscience. v. 1, no. 3, p. 263-276.

Thomas, J. W., M. G. Raphael, R. G. Anthony, et al. 1993. Viability assessments and management considerations for species associated with late successional and old-growth forests of the Pacific Northwest. U.S. Department of Agriculture, National Forest System, Forest Service Research, Washington, D.C. 530 p.

Vickery, H. 1995. Back from the brink. Endangered Species Bulletin. v. 20, no. 4, p. 15.

U.S. Department of the Interior and U.S. Department of Commerce. 1994. (See Appendix 6 of this document for a reproduction of the No Suprises Policy.)

USFWS. 1996. Endangered, Threatened, Proposed, and Candidate Species, Critical Habitat, and Species of Concern in the Western Portion of Washington State. North Pacific Ecoregion, U. S. Fish and Wildlife Service, Olympia, WA.

Washington Department of Wildlife. 1994. Priority habitat management recommendations: caves. Washington Department of Wildlife, Olympia.

Washington Forest Practices Board. 1996a. Final environmental impact statement on forest practices rule proposals for northern spotted owl, marbled murrelet, western gray squirrel. Washington Forest Practices Board, Olympia. 1 v.

Watson, G. 1991. Analysis of fine sediment and dissolved oxygen in spawning gravel of the upper Yakima River Basin. Final Report. Washington Department of Fisheries and Washington Department of Ecology, Olympia WA.

Webster's New World Dictionary of the American Language, 2nd ed. 1976. World Publishing Company, Cleveland, OH. 1692 p.

Matrices

1a	Management strategies for HCP (excluding OESF)	No change
1b	Management strategies for alternatives related to the OESF Planning Unit	No change
2a	Summary of environmental consequences in western Washington (excluding OESF)	No change
2b	Summary of environmental consequences in eastern Washington (within HCP planning area)	No change
2c	Summary of environmental consequences in Olympic Experimental State Forest	No change
4.2.1a	Comparison of the alternatives by all criteria	No change
4.2.1b	Management strategies for HCP (excluding OESF)	No change
4.2.3	Management strategies for HCP (excluding OESF)	No change
4.3.1	Management strategies for HCP (excluding OESF)	No change
4.4.1	Management strategies for alternatives related to the OESF Planning Unit	No change

4.4.2a Management strategies for alternatives related to the OESF Planning

pg. 4-246 - change bullet (1) in second column:
(1) those that average ~~146~~ 144 feet (~~slope~~ horizontal distance) on Type 1 Waters, ~~136~~ 134 feet on Type 2 waters, ~~95~~ 92 feet on Type 3 Waters, ~~96~~ 87 feet on Type 4 Waters, and ~~105~~ 95 feet on Type 5 Waters [totals approximately 55% of the riparian areas in the OESF] and,

4.4.2b	Summary of potential environmental consequences for OESF riparian strategy	No change
4.4.3a	Management strategies for alternatives related to the OESF Planning Unit	No change
4.5.1a	Management strategies for HCP (excluding OESF)	No change
4.5.1b	Management strategies for alternatives related to the OESF Planning Unit	No change

4.5.2a Management strategies for HCP (excluding OESF)

pg.4-366 - change third paragraph in third column:

Unlisted species protected through spotted owl, marbled murrelet, and riparian conservation strategies, protection of uncommon habitats, and additional mitigation for ~~species of concern~~ particular species...

4.5.2b Management strategies for alternatives related to the OESF Planning Unit — No change

pg. 4-462 - change third column of Matrix 4.5.4a:

Alternative B Proposed HCP
...(1) talus fields larger than 1 acre: no harvest, 100-foot buffer with 60% canopy coverage; Forested talus: maximum harvest of 1/3 (vol.), yarding generally cannot physically disrupt talus, includes provision for mining of talus and road construction,

pg. 4-463 - change third column of Matrix 4.5.4a:

Alternative B Proposed HCP
with preference given to wildlife trees; applicable safety standards will be followed; attempt will be made to retain at least 2 live trees per acre harvested and at least 1/2 of the trees retained from the largest diameter class available; three snags per acre and three other green recruitment trees per acre; leave trees may be clumped.

4.5.4b Management strategies for alternatives related to the OESF Planning Unit	No change

Tables

1.1	Summary of public information and involvement for DNR's conservation planning project	No change
2.5.1	Key to potential alternatives related to eight planning units in HCP area (excluding OESF)	No change
2.5.2	Summary of management under the No Action alternative	No change
2.5.3	Summary of management under Alternative B	No change
2.5.4	Summary of management under Alternative C	No change
2.6.1	Key to potential alternatives related to Olympic Experimental State Forest (OESF)	No change
2.6.2	OESF management under Alternative 1 (No Action)	No change
2.6.3	OESF management under Alternative 2 (Unzoned Forest)	No change
2.6.4	OESF management under Alternative 3 (Zoned Forest)	No change
3.1.1	Approximate acreage covered by the HCP by trust category	No change
3.1.2	Acreage by ownerships within the HCP plan vicinity	No change
3.4.1	DNR-managed lands by age class for even-aged stands	No change
3.4.2	DNR-managed lands by dominant size class for uneven-aged stands	No change
4.2.1	Threats to the spotted owl population as described in the Final Draft Recovery Plan for the Northern Spotted Owl (USDI 1992b)	No change
4.2.2	Habitat and spotted owl site centers protected under the President's Forest Plan	No change
4.2.3	Distribution of potential spotted owl habitat estimated by forest stands 70 years old and older on DNR-managed lands in the five western Washington planning units by distance band from federal reserves	No change
4.2.4	Distribution of potential spotted owl habitat estimated by the multiple data source method on DNR-managed lands in the five western Washington planning units by distance band from federal reserves	No change
4.2.5	Number of territorial spotted owl activity centers within a median home range radius of DNR-managed lands in distance bands from federal reserves	No change
4.2.6	Analysis of spotted owl habitat within an exclusive home range radius of all known territorial site centers in the HCP planning area	No change
4.2.7	Distribution of projected unknown spotted owl site centers that may influence unsurveyed DNR-managed lands and known sites that influence DNR-managed lands	No change
4.2.8	Change in amount of potentially suitable spotted owl habitat on DNR-managed lands in the five west-side planning units under Alternative A (using forests 70 years old and older as habitat estimation method)	No change

4.2.9 Change in amount of potentially suitable spotted owl habitat on DNR-managed lands in the five west-side planning units under Alternative A (using multiple data source method of habitat estimation)	No change
4.2.10 Change in amount of suitable spotted owl habitat expected by the year 2096 for the five west-side planning units under Alternative B (habitat estimated as forests 70 years old and older)	No change
4.2.11 Change in amount of potential suitable spotted owl habitat under Alternative B in the five west-side planning units using the multiple data source method of habitat estimation	No change

pg. 4-42 - change Table 4.2.12:

Table 4.2.12: Change in amount of suitable spotted owl habitat expected by the year 2096 for the five west-side planning units under Alternative C (habitat estimated as forests 70 years old and older)

A. Within NRF Management Areas	
Expected Suitable Habitat:	
Acres potential habitat in 1996	80,497
Net acres to be developed to meet HCP goal	65,603
Total acres spotted owl habitat by 2096	**146,100**
B. Outside NRF Management Areas	
Acres of forests older than 70 years outside of NRF areas in 1996	105,503
Acres of forests older than 70 years with potential incidental benefit to spotted owls in 2096	~~unknown~~447,300

pg. 4-43 - change Table 4.2.13:

Table 4.2.13: Change in amount of suitable spotted owl habitat expected by the year 2096 for the five west-side planning units under Alternative C (multiple data source method used to estimate habitat)

A. Within NRF Management Areas	
Expected Suitable Habitat:	
Acres potential habitat in 1996	98,430
Net acres to be developed to meet HCP goal	47,670
Total acres spotted owl habitat by 2096:	**146,100**
B. Outside NRF Management Areas	
Acres of forests older than 70 years outside of NRF areas in 1996	267,570
Acres of forests older than 70 years with potential incidental benefit to spotted owls in 2096	~~unknown~~447,300

4.2.14 Change in distribution of potential spotted owl habitat as estimated by forests older than 70 years from 1996-2096 for Alternatives A, B, and C	No change
4.2.15 Summary of habitat conditions within a median home range radius of spotted owl activity centers that influence DNR-managed lands: total amount of habitat within spotted owl circles	No change
4.2.16 Summary of habitat conditions within a median home range radius of spotted owl activity centers that influence DNR-managed lands: amount of habitat on DNR-managed lands within spotted owl circles	No change
4.2.17 Landowner/manager status at territorial activity centers that are on or within 2.0/2.7 miles of DNR-managed lands in the five west-side planning units	No change
4.2.18 Estimates of likelihood of long-term persistence of known spotted owl site centers under Alternative A	No change
4.2.19 Assessment of territorial spotted owl site centers for risk of incidental take outside of proposed NRF management areas under Alternative B	No change
4.2.20 Assessment of incidental take of territorial spotted owls at site centers affected by management of DNR NRF areas under Alternative B in the near term	No change

4.2.21 Assessment of incidental take of known territorial spotted owls affected by management of DNR NRF areas under Alternative B assuming 50 percent habitat levels on NRF areas within spotted owl circles	No change
4.2.22 Alternative B - projections of the number of spotted owl site centers with owl circles overlapping NRF management areas in the five west-side planning units	No change
4.2.23 Assessment of risk of incidental take of resident owls at site centers located outside of proposed NRF management areas under Alternative C	No change
4.2.24 Assessment of incidental take of territorial spotted owls affected by management of DNR NRF areas under Alternative C in the near term	No change
4.2.25 Assessment of incidental take of territorial spotted owls occupying known site centers affected by management of DNR NRF areas under Alternative C assuming a 60 percent habitat level	No change
4.2.26 Alternative C - projections of the number of spotted owl activity centers with owl circles overlapping NRF management areas in the five west-side planning units	No change
4.2.27 Comparison of provision of dispersal habitat among alternatives for the five west-side planning units assuming that both Dispersal and NRF management areas have reached their target levels of habitat	No change
4.2.28 Old-growth, large-saw, and small-saw forests below 3,500 feet and less than 66 miles from marine waters by ownership	No change
4.2.29 Age (years) when four and eight trees per acre, 32 inches dbh and larger occur in fully stocked and lower stocked managed stands in coastal Douglas-fir stand types	No change
4.2.30 Age (years) when four and eight trees per acre 32 inches dbh and larger occur in fully stocked and lower stocked managed stands of coastal stern hemlock stand types	No change
4.2.31 Estimated acreage of marbled murrelet habitat on DNR-managed lands by stand type and planning unit before deferral and occupancy rates are taken into account for each alternative	No change
4.2.32 Estimated acres of marbled murrelet habitat on DNR-managed lands for No Action (Alternative A) taking into account deferral rates for each inland zone currently implemented by DNR	No change
4.2.33 Estimated acres of marbled murrelet habitat protected on DNR-managed lands for Alternative B taking into account the expected stand occupancy rates (percent of stands surveyed and found to be occupied) for each planning unit	No change
4.2.34 Summary of the environmental consequences of the No Action and Habitat Conservation Plan alternatives according to the two biological criteria	No change
4.3. Spotted owl site centers (status 1, 2, and 3) within a median home range radius of DNR-managed lands by planning unit	No change

4.3.2 Spatial distribution relative to federal reserves of spotted owl site centers (status 1, 2, and 3) within a median home range radius of DNR-managed lands — No change

4.3.3 Summary of habitat conditions within a median home range radius of spotted owl site centers that are influenced by DNR-managed lands. Presented as the proportion of owl circle that is classified as habitat — No change

pg. 4-188 - change first row of Table 4.3.4

Table 4.2.34: Summary of the environmental consequences of the No Action and Habitat Conservation Plan alternatives according to the two biological criteria

Criteria	Alternative A No Action	Alternative B Proposed HCP	Alternative C
Amount of nesting habitat protected by each alternative in near term	60,283 acres of potential nesting habitat deferred over an unknown time period.	38,442 acres of occupied nesting habitat protected over a 10 year period. Suitable, unoccupied habitat protected in southwest Washington.	60,664 acres of occupied nesting habitat and suitable unoccupied habitat protected over a 10-year period.

4.3.5 Total DNR-managed lands and DNR-managed lands classified as spotted owl habitat by planning unit — No change

4.3.6 Spatial distribution relative to federal reserves of DNR-managed lands and DNR-managed lands classified as owl habitat — No change

4.3.7 DNR-managed lands currently in owl circles by planning unit — No change

4.3.8 Spatial distribution relative to federal reserves of DNR-managed lands currently in owl circles — No change

4.3.9 Alternative A: DNR-managed forest classified as spotted owl habitat available for harvest in the three east-side planning units — No change

4.3.10 NRF management areas by planning unit — No change

4.3.11 HCP alternatives: DNR-managed forest classified as spotted owl habitat available for harvest in the three east-side planning units — No change

4.3.12 Comparison of alternatives. Projected change in the spatial distribution of spotted owl habitat by planning unit — No change

4.3.13 Comparison of alternatives. Projected change in the spatial distribution of spotted owl habitat by distance band — No change

4.3.14 Projected impacts to known spotted owl site centers under

Alternative A, the No Action alternative	No change

pg. 4-209 - change second column of Table 4.3.15:

Table 4.3.15: Assessment of incidental take of spotted owl site centers that have owl circles outside of proposed NRF management areas for the east-side planning units

Alternative B (site centers)
3
3
~~13~~12
~~75~~
7
~~20~~17
10
3
33

4.3.16	Assessment of incidental take of spotted owl site centers that have owl circles overlapping the proposed NRF management areas for the east-side planning units	No change
4.3.17	Assessment of incidental take of projected unknown spotted owl site centers for the east-side planning units	No change
4.3.18	Summary of incidental take for owl circles outside of NRF management areas, owl circles overlapping NRF management areas, and projected unknown site centers	No change
4.3.19	Alternative B: Projections of the number of spotted owl site centers with owl circles overlapping NRF management areas in the east-side planning units	No change
4.3.20	Alternative C: Projections of the number of spotted owl site centers with owl circles overlapping NRF management areas in the east-side planning units	No change
4.3.21	HCP Dispersal management areas by planning unit	No change
4.3.22	Total area capable of functioning as dispersal habitat for spotted owls	No change

pg 4-233 - change third column of Table 4.3.23

Table 4.3.23: Summary of alternatives for all criteria

Alternative B
19,600 acres -71 percent change high long-term certainty
narrowly distributed low fragmentation
incidental take ~~32~~29 potential take 18
difficult to accurately predict, depends on federal reserves
62,100 acres high long-term certainty
strategically distributed low fragmentation
decrease in sink population
increase in parameters governing process
large reduction
large reduction
high risk of habitat loss guaranteed habitat replacement

4.4.1	Comparison of regulated Forest Practices RMZ widths with Riparian-buffer widths established by current practices to protect unstable ground in some areas of the OESF (i.e., 55 percent of state-managed lands in the Experimental Forest)	No change
4.4.2	Status of known fish stocks in the Olympic Experimental State Forest	No change
4.4.3	State-listed plants likely to occur in riparian areas within the Olympic Experimental State Forest	No change
4.4.4	Water-quality-limited streams in the Olympic Experimental State Forest	No change

pg. 4-295 - change Table 4.4.5 and 4.4.6:

Table 4.4.5: Average riparian-buffer widths, rounded up to the nearest 10 feet, derived from a statistical analysis of buffer protection previously applied to about 55 percent of state-managed lands on the OESF (see text for discussion)

Widths are expressed for each stream type as average ~~slope~~ horizontal distances measured outward from the active ~~channel margin~~ 100-year floodplain margin (generally coincident with the active channel margin in the OESF) on either side of the stream.

Stream type	Width of riparian interior-core buffer (~~slope~~ horizontal distances)
1	150 ft.
2	150 ft.
3	100 ft.
4	100 ft.
5	100 ft.

Table 4.4.6: Average widths of the OESF exterior riparian buffer

Widths are expressed for each stream type as average ~~slope~~ horizontal distances measured outward from the interior-core buffer on either side of the stream. Widths are proposed as a working hypothesis and are based on local knowledge of windthrow behavior. Buffer widths and design will be evaluated through experiments in buffer design on the OESF.

Stream type	Width of riparian exterior buffer (~~slope~~ horizontal distances)
1	150 ft.
2	150 ft.
3	150 ft.
4	50 ft.
5	50 ft.

4.4.7 Comparison of average interior-core buffer widths, by stream type, with site potential tree heights based on 50-, 100-, and 120-year growing periods — No change

4.4.8	Estimates of forest cover on lands of different ownership in the Olympic Experimental State Forest, July 1991	No change
4.4.9	Estimates of the habitat capability for spotted owls of DNR-managed and all lands in the Olympic Experimental State Forest area, currently and projected 100 years into the future under the No Action, Zoned Forest, and Unzoned Forest alternatives	No change
4.4.10	Model estimates of the current capability of hexagonal sites on DNR-managed and all lands on the Olympic Peninsula to provide habitat suitable to support pairs of spotted owls	No change
4.4.11	Model estimates of the capability in 100 years of hexagonal sites on DNR-managed and all lands on the Olympic Peninsula to provide habitat suitable to support pairs of spotted owls under the No Action, Zoned, and Unzoned Forest HCP alternatives for the OESF	No change
4.4.12	An estimate of the proportion and ownership of potential spotted owl habitat within 2.7 miles of the 69 owl sites within 2.7 miles of DNR-managed lands in the Olympic Experimental State Forest, and the potential for DNR activities under the Zoned Forest alternative to result in incidental take at these sites	No change
4.4.13	An estimate of the proportion and ownership of potential spotted owl habitat within 2.7 miles of the 69 owl sites within 2.7 miles of DNR-managed lands in the Olympic Experimental State Forest, and the potential for DNR activities proposed under the Unzoned Forest alternative to result in incidental take at these sites	No change
4.4.14	Projections of the proportion of the Olympic Experimental State Forest covered by young and old forest owl habitat based on an exploratory analysis of the outcomes of potential management scenarios under the Unzoned Forest alternative	No change
4.5.1	Status of salmonid stocks within the west-side HCP planning units	
4.5.2	Percent of DNR-managed forest land by HCP planning unit watershed analysis units that contain salmonids	No change
4.5.3	Estimated miles of salmonid-bearing streams (Types 1, 2, and 3) by salmonid species on DNR-managed lands in the five HCP planning units west of the Cascade crest (excluding the OESF)	No change
4.5.4	Percent of total land area impacting salmonids that is managed by DNR in the five HCP planning units west of the Cascade crest (excluding the OESF)	No change
4.5.5	Vascular plant taxa within the HCP planning area that are listed or proposed to be listed by the federal government	No change

pg. 4-456 through 4-458 - change Table 4.5.6:

Table 4.5.6: ~~Federal candidate vascular~~Vascular plant taxa ~~(as of September 1993)~~ within the HCP planning area that are a special concern to the U.S. Fish and Wildlife Service

NHP = Natural Heritage Program; **POEX** = Possibly extinct or extirpated; **E** = Endangered; **T** = Threatened; **S** = Sensitive; **OESF** = Olympic Experimental State Forest; **WW** = Western Washington; **EW** = Eastern Washington within the range of the northern spotted owl.

Scientific Name	NHP Status	HCP Planning Areas	Geographic Area and/or Habitat Comments
Abronia umbellata ssp. *acutalata**	POEX	WW, OESF	coastal dunes
Artemisia campestris ssp. *borealis* var. *wormskioldii**	E	EW, WW	Columbia River; shoreline
Aster curtus	S	WW	lowland prairies
Astragalus australis var. *olympicus**	T	W	NE Olympics; talus/scree
Astragalus pulsiferae var. *suksdorfii*	E	EW	Klickitat Co.; open forest
*Astragalus sinuatus**	E	EW	shrub-steppe
Botrychium ascendens	S	WW, EW	mid- to upper elevations; ridges/meadows
Calochortus longebarbatus var. *longebarbatus*	S	EW	Klickitat Co.; meadow/open forest
*Castilleja cryptantha**	S	WW	Mt. Rainier; moist meadows
Cimicifuga elata	T	WW	low elevation forest
Corydalis aquae-gelidae	T	WW	Skamania and Clark Cos.; seeps, creeks above 2,500 feet
Cypripedium fasciculatum	T	EW	forest
Delphinium leucophaeum	E	WW	SW Washington; lowland prairies

NHP = Natural Heritage Program; **POEX** = Possibly extinct or extirpated; **E** = Endangered; **T** = Threatened; **S** = Sensitive; **OESF** = Olympic Experimental State Forest; **WW** = Western Washington; **EW** = Eastern Washington within the range of the northern spotted owl.

Scientific Name	NHP Status	HCP Planning Areas	Geographic Area and/or Habitat Comments
Delphinium viridescens	E	EW	Wenatchee Mtns.; meadows/moist areas
Dodecatheon austrofrigidum	T	WW, OESF	southern Olympics
Erigeron howellii	T	WW	Columbia River Gorge; nonforested areas
Erigeron oreganus	T	WW	Columbia River Gorge; exposed basalt
Filipendula occidentalis	T	WW	SW Washington; riparian
Hackelia venusta	E	EW	Wenatchee National Forest; talus/scree
Lathyrus torreyi	----**	WW	Clark, Pierce Cos.; conifer forest
*Lomatium tuberosum**	T	~~Yakima, Kittitas, Grant Cos.; talusEW~~EW	Yakima, Kittitas, Grant Cos.; talus
Lomatium suksdorfii	~~S~~S	EW	Klickitat Co.; open slopes
Lupinus sulphureus var. *kincaidii*	E	WW	SW Washington; lowland prairies
Meconella oregana	T	WW, EW	Puget trough and Klickitat Co.; grassland and savannah
Mimulus jungermannioides	POEX	EW	Klickitat Co. seeps in Columbia River basalt

NHP = Natural Heritage Program; **POEX** = Possibly extinct or extirpated; **E** = Endangered; **T** = Threatened; **S** = Sensitive; **OESF** = Olympic Experimental State Forest; **WW** = Western Washington; **EW** = Eastern Washington within the range of the northern spotted owl.

Scientific Name	NHP Status	HCP Planning Areas	Geographic Area and/or Habitat Comments
Penstemon barrettiae	~~Klickitat Co.; exposed basaltEW, WWT~~T	EW, WW	Klickitat Co.; exposed basalt
~~*Poa unilateralis*exposed rock*~~*Petrophytum cinerascens**	T	~~WW~~EW	~~coastal grassy bluffs~~exposed rock
*Ranunculus reconditus**	T	EW	Klickitat Co.; steppe grassland
*Rorippa columbiae**	E	EW, WW	Columbia River; shoreline
~~*Wenatchee Mtns.; meadow/forestEWESidalcea oregana var. calva*~~ *Silene seelyi*	T	EW	Wenatchee Mtns.; exposed rock
Sisyrinchium sarmentosum	T	WW	Skamania and Klickitat Cos.; meadows
Sullivantia oregana	T	WW	Columbia River Gorge; exposed rock
*Tauschia hooveri**	T	EW	shrub-steppe
Trifolium thompsonii	T	EW	Chelan and Douglas Cos.; grassland and forest edge

* These species are unlikely to be affected by proposed HCP management plans. See discussion below.

** The NHP status of *Lathyrus torreyi* was undetermined as of August 1996.

It was thought to be possibly extirpated until a population was discovered on McChord Air Force Base in 1994.

4.8.1 Summary of water resources and related influences on DNR-managed lands in the North Puget Planning Unit — No change

4.8.2 Summary of water resources and related influences on DNR-managed lands in the South Puget Planning Unit — No change

4.8.3	Summary of water resources and related influences on DNR-managed lands in the Columbia Planning Unit	No change
4.8.4	Summary of water resources and related influences on DNR-managed lands in the Straits Planning Unit	No change
4.8.5	Summary of water resources and related influences on DNR-managed lands in the South Coast Planning Unit	No change
4.8.6	Summary of water resources and related influences on DNR-managed lands in the Chelan Planning Unit	No change
4.8.7	Summary of water resources and related influences on DNR-managed lands in the Yakima Planning Unit	No change
4.8.8	Summary of water resources and related influences on DNR-managed lands in the Klickitat Planning Unit	No change
4.8.9	Summary of water resources and related influences on DNR-managed lands in the OESF Planning Unit	No change
4.8.10	Water-quality-limited streams within (5) west-side planning units	No change
4.8.11	Water-quality-limited streams within (3) east-side planning units	No change
4.8.12	Water-quality-limited streams within the Olympic Experimental State Forest	No change
4.9.1	HCP planning units and major tribes associated with those lands	No change
4.9.2	Types of archaeological and historic sites within the borders of DNR's nine HCP planning units	No change

pg. 4-532 change Table 4.10.1:

Table 4.10.1: Aggregate harvest levels ~~and timber-related jobs,~~ by alternative

Source: ~~Total timber-related jobs are based on response coefficients (jobs per million board feet) developed for national forest timber harvest levels in~~ Washington ~~State~~. Department of Natural Resources 1996 ~~Contact Regional Economist, U.S. Forest Service, Land Management Planning, Region 6 Office, Portland, Oregon.~~

	Timber Harvest[1] ~~Total Timber-related Jobs[2]~~					
	Alts. A, 1	Alts. B, 2	Percent Change in Harvest Levels[32]	Alts. ~~A, 1~~ C, 3	~~Alts. B, 2~~	Percent Change in ~~Timber-related jobs[3]~~ Harvest Levels[2]
Expected	724.7	776.0	+ 7.1%	~~14,922.0~~ 606.9	~~15,448~~	~~+ 3.5%~~ -16.3%
Low	471.0	582	+ 23.5%	~~9,699.0~~ 455.2	~~11,586~~	~~+ 18.7%~~ -3.4%

[1] In millions of board feet

[2] ~~Includes direct, indirect, and induced employment from associated harvest level.~~ HCP Alternatives compared with Alts. A, 1.

[3] ~~HCP Alternative B compared with No Action alternative~~

pg. 4-533 - delete Table 4.10.2 and replace with:

Table 4.10.2: Timber-related Job and Income Impacts, by Planning Unit and Alternative

Source: Total timber-related jobs and income are based on response coefficients (jobs and income per million board feet of timber harvest) developed for National Forest timber harvest levels in Washington State. Contact Regional Economist, U.S. Forest Service, Strategic Planning, Region 6 Office, Portland Oregon.

	Total Timber-related jobs[1]					Total Timber-related job income[2]				
	No Action	HCP Option B		HCP Option C		No Action	HCP Option B		HCP Option C	
Unit	Jobs	Jobs	Percent change[3]	Jobs	Percent change[3]	,000 Dollars	,000 Dollars	Percent change[3]	,000 Dollars	Percent change[3]
West Side[4]:										
expected	13,671	13,693	+0.2%	10,777	-21.2%	378,683	377,945	-0.2%	294,805	-22.2%
low	8,886	10,270	+15.6%	8,082	-9.0%	246,144	283,459	+15.2%	221,104	-10.2%
East Side[5]:										
expected	313	415	+32.6%	286	-8.7%	7,084	9,380	+32.4%	6,468	-8.7%
low	204	311	+52.5%	215	+5.4%	4,605	7,035	+52.8%	4,851	+5.4%
OESF:										
expected	938	1,340	+42.9%	579	-38.3%	24,990	35,700	+42.9%	15,427	-38.3%
low	610	1,005	+64.8%	434	-28.8%	16,244	26,775	+64.8%	11,571	-28.8%
Total:										
expected	14,922	15,448	3.5%	11,642	-22.0%	410,757	423,025	3.0%	316,700	-22.9%
low	9,700	11,586	19.4%	8,731	-10.0%	266,993	317,269	18.8%	237,526	-11.0%

[1] Includes direct, indirect and induced employment from associated harvest levels.
[2] Includes direct, indirect, and induced employment income from associated harvest level.
[3] Specified Alternative compared with No Action alternative.
[4] Columbia, Straits, North Puget, South Puget and South Coast planning units.
[5] Chelan, Yakima, and Klickitat planning units.

Tables in Appendices

1	Vegetative zones of area covered by the HCP	No change
2	Comparison of classification systems	No change
3	Comparison of Seral Stage Structure and Vegetation	No change
4	Estimates of forest cover on lands of different ownership in the Olympic Experimental Forest area, July 1991	No change
5	Complete list of model parameters and control variables used in spotted owl simulations	No change
6	Forest classifications used in GIS data	No change
7	Landscape parameters and values	No change
8	Values used in calculation of suitable spotted owl habitat threshold	No change
9	Forest growth model used for projecting changes in national forest Late-Successional Reserves	No change

Figures

1-1	How this draft EIS is organized	No change
4.2.1	Acres of potential spotted owl habitat on DNR-managed lands in the five west-side planning units	No change
4.2.2	Distribution of territorial activity centers affecting DNR-managed lands in the five west-side planning units	No change
4.2.3	Amount of habitat on DNR-managed lands within territorial spotted owl circles in the five west-side planning units	No change
4.2.4	Age class distribution on DNR-managed lands from 1996 to 2096 - Alternative A	No change
4.2.5	Age class distribution within five west-side planning units under Alternative B - 1996	No change
4.2.6	Age class distribution within five west-side planning units under Alternative B - 2046	No change
4.2.7	Age class distribution within five west-side planning units under Alternative B - 2096	No change
4.2.8	Age class distribution within DNR NRF areas from 1996 to 2096 - Alternative B	No change
4.2.9	Age class distribution within DNR dispersal areas from 1996 to 2096 - Alternative B	No change
4.2.10	Mean detection rates (number of birds detected per survey morning) of marbled murrelets at 151 sites surveyed in western Washington compared to the calculated probability that each site is occupied by marbled murrelets	No change
4.2.11	The relationship between riparian ecosystem and DNR's riparian management zone	No change
4.3.1	Schematic representation of the conceptual model for demographic support	No change
4.4.1	Schematic example of interior-core and exterior riparian buffers placed on a stream in the OESF	No change
4.4.2	Schematic example of a riparian buffer on a Type 5 channel	No change
4.4.3	Example of riparian buffers currently being applied on a portion of the Clallam River landscape to protect unstable channel banks and	

	adjacent hillslopes	No change
4.4.4	Application of interior-core and exterior buffers to a segment of the Clallam River and its tributaries	
4.4.5	Comparison of interior-core and exterior buffers combined with buffers designed in the field to protect mass-wasting sites	No change
4.4.6	One possible example of a buffer configuration that results from adjusting interior-core and exterior buffers to protect known mass-wasting sites	No change
4.4.7	Estimates of habitat capability for spotted owls of the Olympic Experimental State Forest areas currently, and under the No Action, Zoned Forest, and Unzoned Forest HCP alternatives	No change
4.4.8	Hexagonal habitat map constructed to represent current conditions	No change
4.4.9	Histogram of numeric distribution of site scores at year 100 derived from hexagonal habitat map in Figure 4.4.8 (year 2094)	No change
4.4.10	The numbers of suitable sites projected to result from each of the HCP alternatives for the OESF	No change
4.4.11	Time series of hexagonal habitat maps constructed for the No Action alternative for the OESF	No change
4.4.12	Time series of hexagonal habitat maps constructed for the Zoned Forest alternative for the OESF	No change
4.4.13	Time series of hexagonal habitat maps constructed for the Unzoned Forest alternative for the OESF	No change
4.4.14	Projected trajectories of the Olympic Peninsula spotted owl population	No change
1a-c	Nonlinear functions describing the relationship between spotted owl site score (habitat quality) and certain parameters	No change
2	Flow chart showing one yearly cycle through the spotted owl population simulator	No change

Maps

Map 1	HCP Planning Area with Unit Boundaries	No change
Map 2	HCP Planning Units	No change
Map 3	Five West-side Planning Units	No change
Map 4	Olympic Experimental State Forest Planning Unit	No change
Map 5	Three East-Side Planning Units	No change
Map 6	Location of Uneven-Aged and Even-Aged Stands on DNR-Managed Lands Covered by the HCP	No change
Map 7	Spotted Owl Conservation under Alternative A within the North Puget Planning Unit	No change
Map 8	Spotted Owl Conservation under Alternative A within the South Puget Planning Unit	No change
Map 9	Spotted Owl Conservation under Alternative A within the Columbia Planning Unit	No change
Map 10	Spotted Owl Conservation under Alternative A within the Straits Planning Unit	No change

Map 11 Spotted Owl Conservation under Alternative A within the South Coast Planning Unit — No change

Map 12 Spotted Owl Conservation under Alternative B within the North Puget Planning Unit

Refer to Appendix 3, Changes to DNR's draft Habitat Conservation Plan, Map IV.1.

Map 13 Spotted Owl Conservation under Alternative B within the South Puget Planning Unit

Refer to Appendix 3, Changes to DNR's draft Habitat Conservation Plan, Map IV.2.

Map 14 Spotted Owl Conservation under Alternative B within the Columbia Planning Unit

Refer to Appendix 3, Changes to DNR's draft Habitat Conservation Plan, Map IV.3.

Map 15 Spotted Owl Conservation under Alternative B within the Straits Planning Unit — No change
Map 16 Spotted Owl Conservation under Alternative B within the South Coast Planning Unit — No change
Map 17 Spotted Owl Conservation under Alternative C within the Straits Planning Unit — No change
Map 18 Spotted Owl Conservation under Alternative C within the South Coast Planning Unit — No change
Map 19 Spotted Owl Conservation under Alternative A within the Chelan Planning Unit — No change
Map 20 Spotted Owl Conservation under Alternative A within the Yakima Planning Unit — No change
Map 21 Spotted Owl Conservation under Alternative A within the Klickitat Planning Unit — No change
Map 22 Spotted Owl Conservation under Alternative B within the Chelan Planning Unit — No change
Map 23 Spotted Owl Conservation under Alternative B within the Yakima Planning Unit — No change

Map 24 Spotted Owl Conservation under Alternative B within the Klickitat Planning Unit

Please refer to Appendix 3, Changes to DNR's draft Habitat Conservation Plan, Map 4.6.

Map 25 Spotted Owl Conservation under Alternative C within the Klickitat Planning Unit — No change
Map 26 Current Land Cover from Satellite Imagery of the Olympic Experimental State Forest Planning Unit — No change
Map 27 Alternative 3 (Zoned Forest) within the Olympic

Experimental State Forest Planning Unit	No change
Map 28 Spotted Owl Conservation under Alternative 1 within the Olympic Experimental State Forest Planning Unit	No change
Map 29 HCP Planning Units and Spotted Owl Provinces	No change
Map 30 Current Habitat Conditions on the Olympic Peninsula	No change

SECTION

3.

Section 3 - Response to Comments

Section 3.1 Outline of Comment Categories

Section 3. Response to Comments

3.1 Outline of Comment Categories

Comments relating specifically to this HCP

I. GENERAL COMMENTS

II. DESCRIPTION OF AREA

A. LOCATION, BOUNDARIES, and AREA SIZE

III. ABIOTIC ISSUES

A. AIR QUALITY
B. SOILS
C. WATER
1. Floods/Flow Regime
2. Water Temperature

IV. BIOTIC ISSUES

A. FOREST HEALTH/FIRE
B. SPECIAL HABITATS
1. Old-Growth Habitat
2. Oak Savanna/Woodland
3. Hardwoods
4. Other Key Terrestrial Habitats
   a. TALUS & SCREE
   b. CAVES
   c. CLIFFS
5. Mineral Springs, Springs, Seeps
6. Forested & Nonforested Wetlands
7. Steep and Unstable Slopes
8. Riparian Ecosystem Components
   a. LOCATION AND BOUNDARIES
   b. STREAM SHADING
   c. BANK STABILITY
   d. DETRITUS (litter)
   e. HYDROLOGIC MATURITY

9. **Aquatic Habitats**
   a. **STREAM CLASSIFICATION**
   b. **EPHEMERAL/INTERMITTENT STREAMS**
   c. **INNER GORGES**
10. **Aquatic Habitat Components**
   a. **LARGE WOODY DEBRIS**
   b. **SUBSTRATE** (SEDIMENT)
   c. **CHANNEL MIGRATION & MORPHOLOGY**
   d. **OFF-CHANNEL HABITATS**
11. **Retention of Structural Legacies**
12. **Landscape Planning**
   a. **FOREST FRAGMENTATION**
13. **Habitat-based Approach**
14. **Unique Forest Types** (in section 3.3 only)

C. PLANTS

D. ANIMALS

1. **Wildlife**
   a. **MAMMALS**
      i. **Bats**
      ii. **Other Small Animals**
      iii. **Terrestrial Carnivores**
         (A) wolves
         (B) grizzly bears
         (C) wolverine
         (D) fisher
      iv. **Deer and elk**
   b. **BIRDS**
      i. **Sea, shore & wading birds**
         (A) marbled murrelets
            habitat-relationship study
            marginal habitat
            unoccupied habitat
            occupied habitat
            marine issues
      ii. **Raptors**
         (A) spotted owls
            population impacts & models
            nesting, roosting, & foraging (NRF) habitat
               NRF-designated areas
               quality/definition
               amounts
               distribution
               management within
               nest patches
            dispersal habitat
               dispersal-designated areas
               quality/definition
               amounts/distribution

(B) eagles--bald
(C) falcons-- erigrine
(D) accipiters--goshawk

iii. **Passerines**
(A) Vaux's swift

c. **REPTILES**

d. **AMPHIBIANS**
i. **Frogs** (in section 3.3 only)

e. **FISH**
i. **Anadromous salmonids**
(A) coho
ii. **Resident salmonids**
(A) bull trout

f. **INVERTEBRATES**
i. **Lepidopterids**

g. **Other wildlife issues**
i. **Listed species & species of concern**

E. ECOSYSTEM HEALTH

V. HUMAN ENVIRONMENT

A. ECONOMICS
B. SOCIAL
C. CULTURAL
D. RECREATION
E. AESTHETICS

VI. MANAGEMENT PRACTICES

A. AMOUNT OF HARVEST
B. HARVEST SCHEDULE
C. HARVEST METHODS
D. YARDING METHODS
E. RIPARIAN MANAGEMENT STRATEGY
1. **Riparian Buffer Widths**
2. **Riparian Buffer Treatment**
3. **Wind Buffer**
4. **Wetland Buffers**
5. **Watershed Analysis Prescriptions**

F. RESERVES/REFUGIA
G. HERBICIDES
H. REPLANTING
I. GROWTH & FERTILIZATION (in section 3.3 only)
J. THINNING
K. SALVAGE

L. RESTORATION/RECLAMATION
M. ROAD MANAGEMENT
   1. Construction and Maintenance Standards
   2. Alternatives to Roads
N. TRAIL MANAGEMENT
O. SPECIAL FOREST PRODUCTS
P. OTHER PRACTICES

VII. OTHER PLAN ELEMENTS

A. INVENTORY AND SURVEY
B. RESEARCH
   1. OESF
C. MONITORING/REPORTING

VIII. IMPLEMENTATION ISSUES

A. LENGTH OF PLAN/PERMIT
B. TRANSFERS OF LANDS, SUCCESSORS AND ASSIGNS
C. FUNDING
D. PHASE-IN IMPLEMENTATION
E. LIABILITY
F. PERMIT ENFORCEMENT, SUSPENSION, OR REVOCATION
G. UNLISTED-SPECIES AGREEMENT
H. DEPARTMENT OF THE INTERIOR and
   DEPARTMENT OF /COMMERCE ASSURANCES POLICY
I. LEVEL OF CERTAINTY/UNCERTAINTY
   1. UNFORESEEN CIRCUMSTANCES
   2. EXTRAORDINARY CIRCUMSTANCES
J. CONTINGENCIES
   1. Level of Flexibility
   2. Amendments
   3. Adaptive-Management Techniques
K. TERMINATION CLAUSE

IX. RELATIONSHIPS TO OTHER LAND MANAGEMENT

A. RELATIONSHIP TO MANAGEMENT ON FEDERAL LANDS
B. FEDERAL LANDS TAKE BURDEN
C. LANDSCAPE-ASSESSMENT PROCESSES (WSA, BASELINES, THRESHOLDS)

X. THIRD-PARTY INVOLVEMENT

A. TREATY RIGHTS AND THE FEDERAL TRUST RESPONSIBILITY
B. TRUST RESPONSIBILITIES TO TRIBES (in section 3.3 only)

XI. TRUST BENEFICIARIES

A. MAXIMUM BENEFIT FOR TRUST
B. OBLIGATION TO FUTURE GENERATIONS
C. PRUDENT PERSON DOCTRINE
D. USE OF REGULATORY MINIMUMS
E. OTHER DNR AGREEMENTS
F. PROJECTED HARVEST & REVENUE

XII. PUBLIC INVOLVEMENT

A. PUBLIC INPUT
B. COORDINATION
   1. Tribes
   2. Adjacent Land Manager Coordination

XIII. NEPA/SEPA COMMENTS

A. RANGE OF ALTERNATIVES
B. REASONABLE ALTERNATIVES
C. NO ACTION ALTERNATIVE
D. COMMENT PERIOD LENGTH
E. ADEQUACY OF DOCUMENTS
F. SUPPLEMENTAL EIS
G. SCIENTIFIC CREDIBILITY
H. CUMULATIVE IMPACTS

XIV. APPROVAL/DISAPPROVAL

A. SECTION 7 CONSULTATION
   1. Impact of Take (also refer to Section 7 Consultation)
   2. Critical Habitat
   3. Jeopardy Level
B. SECTION 10 ISSUANCE CRITERIA
   1. Incidental Take
   2. Minimize and Mitigate
   3. Funding
   4. Jeopardy
C. DNR DECISION CRITERIA

XV. MISCELLANEOUS COMMENTS

A. HCP LANGUAGE, LOOPHOLES, VAGARIES, AND TYPOGRAPHICAL ERRORS
B. STATE REGULATIONS
C. WASHINGTON FOREST PRACTICES RULES WATERSHED ANALYSIS
D. HCP COMMITMENTS
E. PRESIDENT'S NORTHWEST FOREST PLAN
F. PROPOSED FEDERAL RULES
G. DNR'S FOREST RESOURCE PLAN
H. FEMAT AND RECORD OF DECISION
I. REMARKS REGARDING DNR HISTORY

XVI. THE HCP PROCESS

A. HABITAT CONSERVATION PLANS
B. PROPERTY RIGHTS
C. THE HCP AND OTHER ASPECTS OF THE ESA

3.2 Comment Summaries and Responses

Comments relating specifically to this HCP

DNR and the Service received 173 comments (either in written form or from testimony). All comments are available for review at DNR's Olympia office, USFWS' Olympia field office, and at the libraries listed on page A2-10 of this document.

I. GENERAL COMMENTS

Summary: The Services received comments from the U.S. Environmental Protection Agency (USEPA), USDA Natural Resource Conservation Service, Washington Department of Fish and Wildlife (WDFW), Washington Department of Ecology (DOE), one member of the State House of Representatives, the Metropolitan King County Council, two county commissioners and a county prosecuting attorney, the Washington State Association of Counties, the City of Port Angeles, Port of Port Angeles, the Northwest Indian Fisheries Commission (NWIFC), Point No Point Treaty Council, Confederated Tribes and Bands of the Yakama Indian Nation (henceforth referred to as the Yakama Indian Nation), Tulalip Tribes, Hoh Indian Tribe, Squaxin Island Tribe, Muckleshoot Indian Tribe, and Elwha/Clallam Tribe. Comments were received from 3 national, 1 regional, and 7 state environmental organizations, Bogle & Gates (a consultant to Washington State University), 9 local environmental groups, 24 representatives of the timber and/or wood products industry, and 139 individuals. In total, the Services received 174 letters and 41 people testified, representing 181 individuals, organizations, or agencies.

The majority of comments from government agencies, tribes, environmental organizations, timber industry representatives, and individuals supported the general concept of a Habitat Conservation Plan for DNR-managed lands. Comments from WDFW and the vast majority of comments from tribes, environmental organizations, and individuals recommended or requested more protection for fish and wildlife. Some individuals were completely opposed to the draft HCP for ecological/environmental reasons. The majority of timber industry representatives were opposed to many of the specific conservation measures proposed in the draft HCP.

Response: Comments supporting and opposing the HCP are noted. For responses to topical comments, please see the topical outline at the beginning of this section.

II. DESCRIPTION OF AREA

A. LOCATION, BOUNDARIES, AND AREA SIZE

Summary: Washington DOE, NWIFC, Point No Point Treaty Council, Yakama Indian Nation, Sierra Club, Northwest Ecosystem Alliance, and three individuals recommended that the riparian and/or wetland conservation strategies be applied to the east-side planning units. A representative from Skamania County and the Washington Hardwoods Commission said that all other HCP's have been for smaller areas, and commented that DNR's draft HCP covered too large a geographic area. The Washington Hardwoods

Commission could not envision how such a large plan could address all of the various problems. Two representatives of the timber industry said that all other HCP's have been for "sensitive" areas only, and questioned why DNR's draft HCP was for all state forest lands and not just for "sensitive" state lands. One timber company said the HCP will set aside 30 to 40 percent of DNR-managed land.

Response: The conservation planning process enabled in Section 10(a)(1)(b) of the ESA is entirely voluntary. Many HCP decisions, including species and lands the applicant wants covered under the incidental take permit (ITP) and unlisted species agreement, are applicant driven decisions. DNR prepared the HCP voluntarily to address specific species conservation and ecosystem management options for DNR-managed forest lands within the geographic range of the northern spotted owl. DNR has indicated that an HCP with riparian and multispecies strategies may be developed for DNR-managed lands east of the Cascade crest sometime in the future.

Although DNR-managed lands east of the Cascade crest are not included in the HCP riparian and multispecies strategies, these lands would continue to be regulated under Section 9 of the ESA and state law. Furthermore, DNR manages its forests according to policies promulgated in its Forest Resource Plan (DNR 1992b) which has led DNR to implement conservation measures exceeding Washington Forest Practices Rules when in the best interests of the trusts.

DNR's HCP planning area does encompass a large amount of land, it includes all DNR-managed forest lands within the geographic range of the northern spotted owl, or 1.6 million acres. But, the strategy for the northern spotted owl was based on nine smaller planning units. This allowed a flexible strategy which could address the spotted owl conservation issues specific to much smaller regions within the HCP planning area. The same six planning units that are west of the Cascade crest will form the basis of the long-term marbled murrelet strategy. This flexibility is also exhibited by the strategies for salmon and other unlisted species. Strategies for salmon and other unlisted species have not been applied to planning units east of the Cascade crest, and the strategies for the OESF are somewhat different than those for the other west-side planning units.

Because of the large number of owl circles and the large amount of murrelet habitat on DNR-managed land, the ubiquity of salmonid species which are candidates for federal listing, and the presence of several late successional forest and riparian obligate species which are either federal candidates for listing or federal species of concern, nearly all DNR-managed land is considered to be "sensitive."

Over the short-term, the draft HCP designates five types of set-asides or deferrals: forests within 25 feet of Type 1, 2, 3, and 4 Waters; hillslopes with a high risk of mass wasting; owl nest patches; occupied marbled murrelet habitat; and forests in or adjacent to uncommon habitats such as caves and talus. Over the long term, it is anticipated that the only set-asides will be forests within 25 feet of Type 1, 2, 3, and 4 Waters, some unstable slopes, occupied marbled murrelet habitat, and forests in or adjacent to uncommon habitats. Owl nest patches may be harvested after research demonstrates that silviculture can produce high quality spotted owl nesting habitat. Some unstable slopes may be harvested after research demostrates that timber harvest will not increase the frequency or

severity of mass wasting events. Set-asides are expected to be a small proportion of all DNR-managed forests within the HCP planning area.

However, without an HCP a substantial amount of timber currently situated in owl circles cannot be harvested. Also, without an HCP the addition of steelhead or other salmonid species to the federal list of threatened and endangered species is expected to result in regulations which would "lock-up" even more timber.

III. ABIOTIC ISSUES

A. AIR QUALITY

Summary: Five comments expressed a concern about air quality. A representative of the Western Hardwoods Association and another individual stated that 5 percent more carbon dioxide is absorbed by a young forest than by an old forest. One individual said that reductions in prescribed burning would eventually increase air pollution because of the increase in fire hazard, and that dust abatement on forest roads could be a waste of money because there is no science on the impacts of road dust. Another individual believed that carbon monoxide fumes from motor vehicles would harm owls in NRF Management Areas located in the I-90 corridor.

One individual expressed concern about the sensitivity of various owl species to the noise of diesel equipment.

Response: As stated in the draft HCP (p. II.12 to II.14), DNR would comply with all applicable state and federal regulations regarding air quality. It is quite plausible that young forests absorb more carbon dioxide than older forests. DNR's HCP may alter the proportion of DNR-managed land covered by young forest but the overall net effect on the regional and/or global concentrations of atmospheric carbon dioxide should be no different than the No Action alternative. The HCP does not alter to a significant degree the amount of prescribed burning to be conducted by DNR. The one exception to this may be prescribed burns in oak woodland, but only about 500 acres of oak woodland are covered by DNR's HCP. There is no evidence to suggest that spotted owls may suffer adverse effects from highway air pollution in the I-90 corridor.

Restrictions on forest management activities during the breeding season will be in effect within 0.7 mile of known spotted owl site centers (draft HCP Chapter IV, p. IV.9, 20, and 21). The impacts from diesel equipment noise on populations of other owl species would be about the same for all three alternatives thus, would be insignificant.

B. SOILS

Summary: The Rivers Council of Washington, a local environmental organization, and one individual expressed concerns about soils. The Rivers Council of Washington stated that the rate of soil loss is a serious crisis. The local organization believed that insects are extremely important to soil development, and that the draft HCP inadequately addresses these species. This same organization cited a study by Compton and Cole (1991) which supposedly demonstrated that clear-cut logging reduced subsequent forest growth by as much as 40 percent.

Response: All harvest activities on DNR-managed land would require a Forest Practices Notification or Approval; issuance of which is contingent on compliance with provisions of the Washington Forest Practices Act (RCW 76.09). Potential adverse impacts to soils are controlled by Washington Forest Practices Rules which require a SEPA environmental checklist for timber harvest where mass wasting exists (WAC 222-16-050) and require that timber harvest leave land in a condition conducive to future timber production (WAC 222-30-020). In addition, DNR manages its forests according to policies promulgated in the Forest Resource Plan (DNR 1992b) which has led DNR to implement conservation measures exceeding Washington Forest Practices Rules when in the best interest of the trusts. Under DNR's HCP, timber harvest will not occur on hillslopes with a high risk of mass wasting, and to protect stream bank stability, timber harvest will not occur within 25 feet of Type 1, 2, 3, and 4 Waters.

The Services and DNR agree that certain insect species are extremely important to soil development. We know of no evidence which suggests that timber management causes any lasting significant adverse impacts on this particular assemblage of forest invertebrates.

C. WATER

Summary: Washington DOE acknowledges that DNR's draft HCP appropriately addresses key elements for water quality protection in lands managed for timber production. The NWIFC commented that DNR's HCP should consider restoration of 303(d) listed water bodies. The Squaxin Island Tribe requested that the HCP clearly state that it does not meet the standards of the Clean Water Act. A timber industry organization asked for clarification on how Forest Practices Rules interact with EPA water-quality regulations. An individual commented that "Water is the key to the life of that forest and if you protect that water and you do it adequately, then a great deal more will be saved."

Response: The HCP riparian strategy provides better protection than would occur without the HCP for Type 1, 2, 3, and 4 Waters and will eventually affect the natural recovery of 303(d) listed water bodies. The federal Clean Water Act is implemented through state water quality regulations adopted into law by the Washington State Legislature, and administered by Washington DOE and the Washington Forest Practices Board. DNR complies with all state water quality regulations, and therefore, is in compliance with the Clean Water Act. No similar comment was received from USEPA.

The statement about EPA water-quality regulations in the Draft EIS Section 4.4.2.2i was an error. Water quality protection in the State of Washington is achieved through state water quality regulations adopted into law by the Washington State Legislature, and administered by Washington DOE and the Washington Forest Practices Board.

Undeniably, water is the key to life, and protection of this resource in both quantity and quality is important. The approach taken in the draft HCP to protect riparian ecosystems is a recognition of the critical importance of water for salmonid habitat and other forms of life.

1. Floods/Flow Regime

Summary: The NWIFC cited court cases which recognize that tribes have a right to as much water as is needed to protect treaty fisheries. They also requested that the Draft EIS acknowledge the various effects of clear-cut logging on periods of low stream flow.

Response: The comment regarding water rights conferred through treaty is noted. The draft HCP acknowledges the effects of forest management on periods of low stream flow (p. III.64).

2. Water Temperature

Summary: The Muckleshoot Tribe pointed out an error in Table 4.8.10 of the Draft EIS (p. 4-521). Specifically, the Tribe wrote there are several streams within the South Puget Planning Unit that are 303(d) listed because of water temperature. According to the Tribe those streams are: Springbrook Creek, the Green River, Hill (Mill) Creek, Gale Creek, and Smay Creek. They pointed out that Gale Creek and Smay Creek may be directly adversely affected by management activity implemented under DNR's HCP.

Response: The data in Table 4.8.10 was based on information contained in DNR's GIS database at the time that section 4.8.1 of the DEIS was written. Portions of the DEIS were written over one year ago, and so some information in the DEIS may be out of date. The information in Table 4.8.10 was the most up to date information available when section 4.8.1 was written. The source of the water quality data was given as "Washington Department of Ecology, 1994." If information critical to the analysis of the alternatives is outdated, then DNR and the Services will update such information, otherwise outdated, but relatively recent information will not be edited for the FEIS.

The Services and DNR believe the riparian strategy will likely improve water quality in 303(d) streams through time.

IV. BIOTIC ISSUES

A. FOREST HEALTH/FIRE

Summary: WDFW, a representative of Stevens County, Bogle & Gates (a consultant to Washington State University), 2 local organizations, 2 representatives of the timber industry, and 8 individuals expressed concerns about forest health issues. WDFW suggested two ways to make NRF habitat management and management for forest health more compatible: (1) conduct trial experiments outside NRF Management Areas that address forest health issues; and (2) defer harvest in suitable habitat adjacent to NRF Management Areas while conducting experiments in NRF Management Areas. The representative of Stevens County, representatives of the timber industry, and Bogle & Gates (a consultant to Washington State University) were all concerned about the increased risk of fire, insect infestation, and disease that might occur due to "set-asides" or "tying our state lands to federal lands." Several individuals believed that "tree farms" would lead to catastrophic losses due to disease and insect infestation. One individual stated that a reduction in prescribed burning could possibly lead to huge timberland

damage from wildfire. One individual believed that old-growth forest must be retained as a "living laboratory" in order to study forest health issues such as insect infestations and disease.

Response: Harvest of suitable habitat in NRF Management Areas must be deferred until the landscape prescriptions are met. And, after the landscape prescriptions are met, any harvest of suitable habitat must maintain the landscape prescriptions. With respect to forest health, the main forest management activity that may occur is salvage logging. The inclusion of a salvage logging provision in the spotted owl strategy is driven by state law (RCW 79.01.795 and RCW 76.06.040). The Service will be included in discussions of any salvage activities that may be required under these statutes. If they determine that such activities would have an adverse affect on the conservation strategies, DNR and the Service will work together to find sufficient mitigation to allow the activities to proceed (see draft HCP, Chapter IV, pg. IV.11 and IV.21). DNR and Services believe that this is the best strategy for making NRF habitat management, management for forest health, and DNR's legal duties most compatible.

Many land managers, of both private and public lands, are interested in silvicultural methods that restore and maintain forest health and spotted owl habitat. Other land managers may conduct their own experiments in attempt to develop such methods, and DNR will make use of whatever results become available through such research. If DNR believes that such research may result in a net benefit to the trusts, DNR may conduct its own experiments.

Over the short term, the draft HCP designates five types of set-asides or deferrals: (1) forests within 25 feet of Type 1, 2, 3, and 4 Waters; (2) hillslopes with a high risk of mass wasting; (3) owl nest patches; (4) occupied marbled murrelet habitat; and, (5) forests in or adjacent to uncommon habitats such as caves and talus. Over the long term, it is anticipated that the only set-asides will be forests within 25 feet of Type 1, 2, 3, and 4 Waters, occupied marbled murrelet habitat, and forests in or adjacent to uncommon habitats. Owl nest patches may be harvested after research demonstrates that silviculture can produce high quality spotted owl nesting habitat. Some unstable slopes may be harvested after research demostrates that timber harvest will not increase the frequency or severity of mass wasting events. Set-asides are expected to be a small proportion of all DNR-managed forests within the HCP planning area.

Much of the forest land managed by DNR is "tied" to federal land simply by geographic proximity. Some federal land management (National Parks, USFS Wilderness, Late Successional Reserves) may increase the risk of fire, insect infestation, and disease, and so it is conceivable that there is a higher risk of such disturbances for DNR-managed lands adjacent to federal lands. In recognition of various forest health issues, DNR has retained the flexibility to reduce the risk of fire, insect infestation, and disease (draft HCP, Chapter IV, p. IV.9 and 21).

DNR agrees that some late-seral stage forest should be retained for research purposes. DNR has set aside 12 late seral-stage research areas which have a total area of approximately 2,000 acres. These sites will continue to serve a research function under

the HCP. These areas are in addition to approximately 72,000 acres in NAPs and NRCAs, many of which contain late seral-stage forest.

B. SPECIAL HABITATS

Summary: WDFW stated that balds and forested talus may not be adequately protected. The main concern regarding balds is road construction which may harm the meadow plants on which certain rare invertebrates depend, while their main concern regarding forested talus is the Larch Mountain salamander, particularly in the Columbia Planning Unit. A local environmental organization said that studying insects in more detail would be useful for indicating special habitats. One individual believed that Alternative B seems to be economically sensitive and realistic with regard to protection of special habitats.

Response: The Services and DNR agree with the commentor that believes Alternative B, the proposed HCP, is economically sensitive and realistic. However, some strategies required additional measures. For example, talus habitat is known to be very important to the Larch Mountain salamander, especially in the Columbia Planning Unit where most known occupied sites occur. In response to concerns of various commentors, protection of this special habitat has been increased throughout the planning area with specific measures added for talus in the Columbia Planning Unit that includes no-harvest areas, and a 100-foot buffer requiring at least a 60 percent canopy closure (draft HCP, Chapter IV, Section F and Appendix 3, Chapter IV, Section F of this document). Balds are often associated with drier soils, south facing slopes and valley hillsides, and are more commonly found in the Coast Range, Siskiyou Mountains and certain river valleys in Oregon, and in the sub-alpine fir zone of eastern Oregon and Washington (Franklin and Dyrness 1973). In moister western Washington, balds are uncommon but do occur south of Olympia, e.g. Bald Hill and Grand Mound. The DNR HCP is proposed for DNR-managed forested lands within the range of the northern spotted owl. Most of the lands managed by DNR in these areas have already been roaded and harvested once. It is unlikely that new roads will be needed on DNR-managed land in western Washington that contains a bald. DNR will avoid road construction through balds consistent with their landscape-based road management plan. The Services and DNR agree that studying insects may be useful for indicating the presence of unique habitats, and that as this type of information becomes available it may be useful in the application of specific land management activities. The HCP, as proposed, includes conservation strategies aimed at special habitats currently known to be important to listed species or species of concern, as well as conservation strategies that provide some protection for the habitat types that exist on DNR-managed lands; more protection than what would occur under Alternative A.

1. Old-Growth Habitat

Summary: WDFW, National Audubon Society, National Council of the Paper Industry for Air and Stream Improvement (NCASI), Washington Environmental Council, Northwest Ecosystem Alliance, Rivers Council of Washington, The Mountaineers, 5 local environmental organizations, and 70 individuals commented on old-growth forest issues. Fifty-one individuals used an identical form letter. Six of the comments were presented at public hearings. Eighty of the 82 comments on old-growth issues expressed a preference for saving some or all old-growth forest on

DNR-managed lands. WDFW and a local organization thought that some old-growth forest should be maintained in southwest Washington to reduce the risks to late successional species and to preserve biodiversity, respectively. NCASI noted that the activities described for the OESF might reveal how to provide satisfactory habitat for old-growth species in a managed forest. The National Audubon Society, Washington Environmental Council, and a local organization questioned whether enough old-growth forest will exist at low elevations in Washington. Several individuals thought that DNR would cut half of the remaining old-growth on state lands.

Response: The amount of late-seral stage forest on DNR-managed lands will decrease under the HCP, but some late-seral stage forest will remain. Over the short-term, the draft HCP designates five types of set-asides or deferrals: forests within 25 feet of Type 1, 2, 3, and 4 Waters; hillslopes with a high risk of mass wasting; owl nest patches; occupied marbled murrelet habitat; and forests in or adjacent to uncommon habitats such as caves and talus. Over the long term, it is anticipated that the only set-asides will be forests within 25 feet of Type 1, 2, 3, and 4 Waters, some unstable hillslopes, occupied marbled murrelet habitat, and forests in or adjacent to uncommon habitats. These set-asides are expected to be a small proportion of all DNR-managed forests within the HCP planning area.

The OESF spotted owl strategy requires at least 20 percent of DNR-managed land in a landscape planning unit, to be in the understory-reinitiation to old-growth forest stages. In most landscape planning units, this results in the deferred harvest of old-growth for several decades.

DNR has preserved some late-seral stage forest for research purposes. DNR has set aside 12 late-seral stage research areas which have a total area of approximately 2,000 acres. These sites will continue to serve a research function under the HCP. These areas are in addition to approximately 72,000 acres in DNR-managed NAPs (25,000 acre in 45 sites) and NRCAs, (47,000 acres in 23 sites), many of which contain late-seral stage forest.

Some managed forests on DNR-managed lands are expected to be late successional forest, with some portion possessing old-growth characteristics. Over the long term, it is anticipated that spotted owl nest patches in NRF Management Areas will be replaced with managed forest that functions as high quality nesting habitat. These areas will not necessarily function as "old growth" for all species. The amounts of fully functional forests (as defined in draft HCP, Table IV.14) that the HCP is expected to provide are displayed in Table IV.14. The riparian buffer will be managed to provide salmonid habitat. Salmonids require riparian ecosystems with late successional conifer forest to provide large diameter, long-lasting woody debris. While these areas will not be the true old-growth forest, it is expected that many of these areas will provide suitable habitat for some species that depend on old-growth forest.

Under Section 10 of the ESA, the issuance of an ITP requires that: (1) take be incidental to otherwise lawful activities; (2) take be, to the maximum extent practicable, minimized and mitigated; (3) take not appreciably reduce the likelihood

of the survival and recovery of a species in the wild; (4) adequate funding for the plan will be provided by the applicant; and, (5) measures, if any, the Services may require as being necessary and appropriate for the purposes of the plan will be met. The first criterion is easily satisfied. "Practicable" is generally thought of as connoting an action that can be accomplished given technological and economic constraints. Therefore, the second criterion establishes an economic test. Standard models for forest economics show that preserving old-growth forest results in a loss of potential revenue. DNR has a legal duty to produce long-term income for the trust beneficiaries. Setting aside more old-growth forest than is necessary and sufficient to obtain incidental take permits and unlisted species agreements is considered counter to this legal duty.

The third criterion establishes a biological test. FEMAT (1993) and USDA and USDI (1994a) present the results of species viability assessments for mature and old-growth forest species conducted by expert panels for the President's Northwest Forest Plan (commonly reffered to as the Northwest Forest Plan). The vast majority of terrestrial vertebrate species assessed were assigned 100 percent likelihood of having habitat "of sufficient quality, distribution, and abundance to allow the species population to stabilize" on federal land under the President's Northwest Forest Plan. That is, the expert panel was absolutely certain that each of these species would survive under the President's Northwest Forest Plan. Only two species of terrestrial vertebrate in the state of Washington were assigned less than 90 percent likelihood of population stabilization -- the Columbia torrent salamander and Van Dyke's salamander.

Also, all functional groups of arthropods in the northern range of the spotted owl (which includes Washington) were assigned a 100 percent likelihood of population stabilization. In contrast, only seven of the 102 mollusk species which were assessed were rated as having at least 80 percent likelihood of population stabilization. If mature and old-growth species are certain, or nearly certain, to survive on federal land, then DNR's HCP cannot appreciably reduce the likelihood of their survival in the wild. The Columbia torrent salamander,Van Dyke's salamander, and the majority of mollusk species are riparian species. As explained above, late successional forest will be maintained in the riparian buffer. In fact, in most riparian areas, the habitat conditions for these species will improve substantially. For these species, the answer to the second question is that the likelihood of their survival and recovery will increase under the HCP. Thus, it appears the three Section 10 criteria are satisfied for all late successional forest species assessed in FEMAT (1993) except terrestrial mollusks, and an unlisted species agreement should very likely not require the preservation of old-growth forests in southwest Washington and in lowland areas of Washington. Another report (Thomas et al. 1993) found that federal lands alone may not be adequate for the continued conservation of many species, particularly those species for which information is most limited (e.g., most invertebrate, many bat species, the wolverine). The Services remain concerned about the preservation of late-successional forest species about which little is known.

An accurate estimate of the amount of old-growth conifer forest on DNR-managed lands is not available. This is partly due to the problem of defining "old-growth",

and partly due to the problem of completing a forest inventory on 1.6 million acres. Similar problems were encountered when attempting to estimate the amount of spotted owl habitat on DNR-managed land. As explained above, some old-growth forest will be retained through application of the various conservation strategies, but there is no way to accurately determine how much.

2. Oak Savanna/Woodland

Summary: WDFW, the Northwest Forestry Association, Washington Environmental Council, two local environmental organizations, and 51 individuals commented on oak woodlands. WDFW stated that the protection afforded west side oak woodlands is commendable. The Northwest Forestry Association said that "special forest harvest may be the salvation" of oak woodlands. The Washington Environmental Council (WEC) said that conifers should be retained to increase canopy cover, shrubs should not be part of the canopy cover calculation, and that harvest in oak woodlands should be light. The 51 individuals, who mailed an identical form letter, questioned why DNR needed to cut any oak woodlands.

Response: The Services and DNR recognize the uniqueness of oak woodlands and their importance to species such as Lewis' woodpecker and the western gray squirrel. The conservation strategy calls for maintaining the quality and distribution of oak woodlands. Clarifying text has been added which describes the strategy for this special forest habitat type (draft HCP, Chapter IV, Section F and Appendix 3, Chapter IV, Section F of this document). When partial harvests are conducted, all very large dominant oaks will be retained. Canopy coverage will not include shrubs. Thinning will be from below, removing the smallest trees first to maintain the integrity of the oak woodland. Where practicable, DNR will also retain western white pine where it occurs with oak, thus maintaining a mixture of conifer and oak woods cited as being important to the western gray squirrel by one commentor.

3. Hardwoods

Summary: The Muckleshoot Indian Tribe pointed out an apparent discrepancy between the draft HCP (p. IV.66) and the Draft EIS (p. ix) in the proportion of hardwood forest reported to comprise DNR-managed forests. The Northwest Forestry Association wanted to know what level of evaluation was conducted for riparian management zone hardwood to conifer conversion. Two representatives of the Washington Hardwoods Commission, one individual from the Western Hardwoods Association, and one hardwood products company pointed out the beneficial habitat value of riparian and upland alder forests and the important contribution that hardwood stands make to overall forest biodiversity.

Response: Page IV.66 of the draft HCP gives the proportion of hardwood forests which comprise DNR-managed forest in riparian areas (25 percent). Page ix of the Draft EIS gives the proportion of hardwood forests which comprise all DNR-managed forest in both upland and riparian areas (10 percent).

Hardwood to conifer conversion of managed stands was modeled in the harvest calculations which were done for the economic analysis for the draft HCP.

The Services and DNR agree that hardwood forests make an important contribution to overall forest biodiversity. Hardwoods will always be a component of DNR-managed forests, particularly in riparian ecosystems where continual natural disturbance creates environmental conditions conducive to the establishment of hardwoods. Many of today's alder-dominated upland stands were generated in an era of natural regeneration without planting. Later, burning was a common method of site preparation which encouraged alder regeneration to a degree which lead to extensive herbicide spraying and eventually resulted in lesser amounts of alder in regenerating stands. The current trend away from burning will initially result in fewer alder and other deciduous sprouts, thus eliminating the need to spray. This will likely result in a better balanced stand of conifers and deciduous trees over the long term.

4. Other Key Terrestrial Habitats

a. Talus & Scree

Summary: WDFW stated that forested talus may not be adequately protected. The main concern regarding forested talus is the Larch Mountain salamander, particularly in the Columbia Planning Unit. The NWIFC said that there is no scientific basis for allowing 33 percent of the stems or volume to be removed from the buffer around talus field. The NWIFC and the National Audubon Society questioned the value of a strategy that will avoid impacts only when it is "economically reasonable." Point No Point Treaty Council asked that the HCP establish the maximum percent of talus that would be mined or used for roads. WEC recommended that a large proportion of all talus, "80 percent", be granted protection, and that no harvest be permitted in the interior half of the buffer. A local group suggested that DNR investigate methods for rock mining and road construction that are less damaging to talus wildlife communities.

Response: The Services and DNR recognize the importance of protecting talus fields, especially in the Columbia Planning Unit. In response to public comments and concerns of FWS, the talus conservation strategy has been clarified and strengthened to increase protection of talus fields on DNR-managed lands, with additional protection afforded talus fields in the Columbia Planning Unit (draft HCP, Chapter IV, Section F and Appendix 3, Chapter IV, Section F of this document). The language of the strategy has been clarified to exclude the phrase "economically reasonable". Talus fields to be protected are defined as exposed talus greater than 1 acre (1/4 acre in the Columbia Planning Unit) with ≤30 percent canopy coverage and will be treated as no-harvest areas. The edge of the talus field is defined as the point where the canopy coverage is greater than 30 percent. A 100-foot buffer will be applied to the talus field with no harvest permitted unless the canopy coverage is greater than 60 percent, and then 1/3 of the volume will be retained. The conservation objectives in the HCP for talus habitat are to maintain its physical integrity and minimize microclimatic change. At present, the 60 percent minimum canopy coverage is considered necessary by FWS to maintain the temperature and moisture gradients of talus fields utilized by the Larch Mountain salamander. Roading through talus fields will be avoided or minimized when avoidance is impossible. Sedimentation, filling of intersticies within the talus is important for movement within the talus of the

Larch Mountain Salamander to avoid environmental extremes in temperature and moisture. Disturbance of talus will undoubtedly be reduced by the Riparian Conservation Strategy and mass wasting prescriptions. Timber will not be felled into or yarded across talus in such a way that the yarding might disturb the talus field or the humus covering that provides foraging habitat for the Larch Mountain Salamander. The no-harvest area and low-harvest buffer provisions, as well as the provision to avoid mining of talus, are expected to protect talus field integrity.

b. Caves

Summary: The Point No Point Treaty Council recommended that no road be built within 0.25 mile of a cave entrance, no exceptions. They also recommended that DNR gate the entrance to caves that are important wildlife habitat. A local group said that DNR should limit road building activity within 0.25 mile of a cave, and that bat-friendly closures be constructed. One individual said that protection of caves is as important as protecting old-growth forest. Another individual strongly urged adoption of either Alternative B or C for cave protection to conserve bats.

Response: The alternative proposed by DNR is Alternative B. If approved, this alternative as proposed and/or modified will become DNR's HCP. The Services believe DNR has proposed adequate protection of caves by including provisions to protect cave entrances and passages with no-disturbance buffers and restrictions on road construction that are derived from WDFW management recommendations (WDW 1994). In addition, the confidentiality of cave locations will be maintained. These provisions will serve to maintain the microclimate within and contribute to reducing direct human disturbance to caves important to wildlife. It is expected that, by ensuring roads are at least 0.25 mile away from the cave entrance and keeping cave locations confidential, the gating of cave entrances will not be necessary. This strategy has been strengthened with minor clarifying language, including the elimination of the phrase "economically reasonable"(draft HCP, Chapter IV, Section F and Appendix 3, Chapter IV, Section F of this document).

c. Cliffs

Summary: The NWIFC and the National Audubon Society questioned the value of a strategy that will avoid impacts only when it is "economically reasonable." The National Audubon Society also said that the mining of cliffs used by peregrine falcons for nesting must be prohibited. Northwest Forestry Association suggested that mining of cliffs should be allowed provided that the remaining rock structure mimics the natural site or leaves that site attractive to cliff-dwelling wildlife. A local group recommended that a 250 foot buffer be established around 50 percent of cliff faces in a harvesting area.

Response: Under the provisions of the HCP, cliffs with active peregrine falcon nests will be protected according to state Forest Practices Rules. The rules require a SEPA environmental checklist for timber harvest and related activities within 0.5 mile of the nest during the nesting season and within 0.25 mile at

other times of the year. In response to public comments and concerns of the USFWS, the conservation strategy for cliffs has been strengthened to include a site specific review of cliff habitat by DNR and FWS with consideration for peregrine falcon surveys and the subsequent development of protection measures for occupied sites (draft HCP, Chapter IV, Section F and Appendix 3, Chapter IV, Section F of this document). Trees along the base and top of cliffs judged suitable for peregrine aeries, especially perch trees, will be retained. In addition, public access to DNR-managed lands within 0.5 mile of a known peregrine falcon aerie will be restricted, and aerie locations will be kept confidential. While not all cliffs will be protected, concerns about the mining of cliffs occupied by peregrine falcons should be alleviated by this strategy, and by edits to the language that eliminate the phrase "economically reasonable".

5. Mineral Springs, Springs, Seeps

Summary: WDFW believed that springs, mineral springs, and seeps are not adequately protected. Mineral springs were a concern because the band-tailed pigeon depends on them. A local organization recommended that buffers be placed around seeps.

Response: Seeps and springs may be adequately protected by the wetland buffers where there is an adjacent pond or pool. Wetlands will receive buffers at least 100 feet wide, measured as the horizontal distance, with the primary objective to maintain hydrologic function. However, springs and seeps are more likely to be in forested areas, i.e. forested wetlands, often associated with headwater streams. Language has been added to address seep protection such that seeps greater than 0.25 acre will be treated as a forested wetland with the same protection, while seeps less than 0.25 acre will receive protection when they occur in the unstable slopes adjacent to Type 5 waters (see Appendix 3, Chapter IV, Section F of this document). Timber harvest is allowed in forested wetlands as long as a minimum basal area of 120 square feet per acre is maintained. This will contribute to the maintenance of seep integrity but it may not provide sufficient perch sites or mast forage for wildlife known to utilize mineral springs and the adjacent area, such as the band-tailed pigeon. In response to concerns expressed by commentors and the USFWS, provisions were added to DNR's HCP to strengthen the protection of mineral springs (Appendix 3, Chapter IV, Section F of this document). Mineral springs will have a 200-foot wide buffer to protect adjacent vegetation. Such activities within these zones will be designed to retain adequate trees for perching, and to maintian berry, fruit, and mast-producing shrubs and trees which provide food sources. Trees designated for harvest will be directionally felled, restriction will be placed on the use of pesticides and herbicides, and no ground disturbance or yarding will be allowed. This conservation strategy should minimize the degradation of mineral springs and serve to maintain band-tailed pigeon habitat.

In response to concerns expressed by commentors, language was added to DNR's HCP to strengthen protection of seeps. Seeps greater than 0.25 acres will be treated as forested wetlands. Seeps less than 0.25 acres will be provided the same protection as Type 5 waters. That is, such features will be protected where part of an unstable hillslope. Research to study the effects on aquatic resources of forest management in

around seeps and small wetlands will be included in the research program for Type 5 waters.

6. Forested & Nonforested Wetlands

Summary: WDFW, the Point No Point Treaty Council, Muckleshoot Indian Tribe, Bogle & Gates (a consultant to Washington State University), Sierra Club, Northwest Forestry Association, Northwest Ecosystem Alliance, Washington Environmental Council, Washington Rivers Council, Washington Wilderness Coalition, Washington Native Plant Society, eight representatives from seven separate local environmental organizations, one local timber company, and at least 8 individuals commented on wetland issues. Twenty-one of the 28 comments said that more protection of wetlands is necessary. Of these, 12 commentors, including the Point No Point Treaty Council, Northwest Ecosystem Alliance, Washington Environmental Council, and the Washington Native Plant Society, preferred the wetland management strategy described in Alternative C. To satisfy the habitat requirements for many species, WDFW recommended 200 foot buffers with old-growth forest habitat qualities around nonforested wetlands. The Muckleshoot Indian Tribe pointed out that the Draft EIS did not assess the impacts of roads on wetlands. Several commentors questioned the value of Alternative B since this wetland management strategy is the same as the No Action Alternative (Alternative A). The Rivers Council of Washington claimed that the draft HCP wetlands protection was no different than Washington Forest Practices Rules. The Northwest Forestry Association, Bogle & Gates (a consultant to Washington State University), and the local timber company expressed concerns about the effects of the wetland strategy on the amount of timber harvest. The Northwest Forestry Association was also concerned about the effects on forest management operations. One individual said Alternative A provided adequate protection if road density is controlled.

Response: DNR did consider wider wetland buffers and "no-harvest" wetland buffers for its HCP. It was determined that an HCP which specified more protection of wetlands than that specified in the draft HCP would not satisfy one of the main purposes of the proposed action -- to produce the most substantial support possible over the long term for the trusts. It is thought that the wetland strategy in the draft HCP satisfies this purpose and is sufficient to satisfy Section 10 of the ESA.

The wetlands management in DNR's HCP provides more protection than the Forest Practices Regulations and will fully implement DNR's Forest Resource Plan Policy No. 21 which says, "The department will allow no overall net loss of naturally occurring wetland acreage of function." This standard is beyond the level of protection provided by the Forest Practices Rules to ensure future flexibility through maintaining a healthy forest environment. The Forest Resource Plan was approved in 1992, but it has yet to be fully implemented. The prescriptions described in the draft HCP (p. IV.57-58) are not DNR's current practices, but are characterized as "no action" because they implement the direction given by the Forest Resource Plan.

The effects of the wetland strategy on forest management operations are the same for Alternatives A and B, and the effects are expected to be insignificant. The wetland acreage on DNR-managed lands is not accurately known, but is estimated to be

approximately 10,500 acres, only 0.6 percent of the entire HCP planning area (all 9 HCP planning units).

Adverse impacts of roads on wetlands should be insignificant. Under Alternatives A and B, no road building shall occur in wetlands or wetland buffers without mitigation (draft HCP p. IV.58). Roads constructed in wetlands or wetland buffers will require on-site and in-kind equal acreage mitigation. Also, the effects of roads on natural surface and subsurface drainage will be mitigated.

7. Steep and Unstable Slopes

Summary: A county commissioner, the Muckleshoot Indian Tribe, Tulalip Tribes, The Mountaineers, a local organization, and two individuals commented on issues related to steep and unstable slopes. The county commissioner believes that the protection for unstable slopes is excessive. The Tulalip Tribes was concerned that the methods to be used for delineating unstable slopes are not described in the draft HCP. The Muckleshoot Indian Tribe questioned how DNR would demonstrate ways to harvest timber on unstable slopes given that landslides may not occur for 20 years after harvest. The Mountaineers recommended that only helicopter logging be used on unstable slopes in the OESF. An individual was pleased that the draft HCP proposes, "a method for delineating on a site-specific basis portions of hillslopes with a high risk of mass wasting will be described in agency procedures to be developed for this HCP." One individual said to drop the word "random" from the description of landslides in the draft HCP.

Response: The protection for unstable slopes described in the draft HCP is not viewed as excessive. Harvest will be deferred on unstable slopes only until it is demonstrated, in a scientifically credible manner, that timber harvest can be accomplished without severely altering the natural input of large woody debris, sediments, and nutrients to the stream network.

DNR chose not to include particular methods for the delineation of unstable hillslopes in the draft HCP. Methods for delineating unstable hillslopes are evolving, and therefore, it is anticipated that more comprehensive and accurate methods than those currently used by DNR will be developed during the term of the HCP. DNR will utilize these tools as they become available.

It may be true that landslides sometimes do not occur until 20 years after harvest, but forest management is a commercial activity that requires a long-term view. Activities are scheduled by the decade. Assessing stand or landscape conditions 20 years after timber harvest is common practice.

Helicopter logging will be considered in the OESF and all other planning units if (1) it is demonstrated that timber harvest can be accomplished without severely altering the natural input of large woody debris, sediments, and nutrients to the stream network; and (2) it is demonstrated that all other less costly methods of yarding timber will severely alter the input of these materials to the stream network.

8. Riparian Ecosystem Components

a. Location and Boundaries

Summary: The Yakama Indian Nation suggested that DNR's HCP be applied to eastern Washington. The Yakama Indian Nation pointed out that 64 percent of the fish stocks in the Columbia River basin were either "depressed" or in "critical" condition, and while DNR's HCP has a riparian strategy for a small portion of the Columbia River drainage in the Columbia Planning Unit, the HCP does not cover aquatic resources on DNR-managed lands in the remainder of the Columbia River drainage. The Yakama Indian Nation pointed out that several eastern Washington bull trout populations are in jeopardy, "yet no emphasis is placed by the WDNR in the HCP or Draft EIS (for bull trout on the east side)." The Point No Point Treaty Council said that without eastern Washington habitat protection, additional listings under ESA could result. The Muckleshoot Indian Tribe stated that in some estuaries DNR's management of state aquatic lands has directly or indirectly impaired the suitability of these areas to support salmon. Also, they said that DNR has demonstrated a reluctance to use such lands for restoration purposes and that the Draft EIS does not addressed DNR-managed state aquatic lands.

WEC supported the HCP for western Washington, but recommended that DNR institute a riparian strategy in the eastside regions. The Washington Wilderness Coalition wants DNR to extend the HCP riparian protection to eastern Washington. The Northwest Ecosystem Alliance said that eastern Washington riparian ecosystems have high biodiversity, and also requested that DNR's HCP provide protection for streams in eastern Washington. An individual stated that he would like the riparian strategy applied to eastern Washington.

Response: Many HCP decisions, including species and lands the applicant wants covered under the incidental take permits and unlisted species agreement, are applicant driven decisions. DNR decided not to develop conservation strategies for salmon habitat in the east-side planning units because of the magnitude of non-forestry related adverse impacts (i.e., agriculture, grazing, dams, etc.).

Although DNR-managed lands east of the Cascade crest are not included in the draft HCP riparian and multispecies strategies, these lands will continue to be regulated under the ESA and state law. Furthermore, DNR manages its forests according to policies promulgated in the Forest Resource Plan (DNR 1992b) and the Washington Forest Practices Rules.

b. Stream Shading

Summary: The Northwest Forestry Association said that stream temperature does not justify expanded riparian zones. The Washington Forest Protection Association recommended that DNR use the Washington Forest Practices Rules to protect stream temperature. A local environmental group emphasized the need for shade. An individual said that timber harvest will harm microclimate.

Response: The width of the RMZs in the draft HCP has been based on conservation of functioning riparian ecosystems, not solely on water temperature

control. Water temperature in the range preferred by salmonids is an important element of riparian ecosystems, but only one of several critical elements (i.e., bank stability, large woody debris, nutrients, etc.). If the buffer is less than 100 feet wide, or if the buffer is selectively logged, considerations such as species composition, stand age, and vegetation density become important (Beschta et al. 1987). As explained in the DEIS (p. 4-158 to 4-162) Alternative B provides superior stream shading to that provided by Alternative A, and Alternative B should provide stream shading similar to that provided by undisturbed old-growth forest.

The Washington Forest Practices Rules allow selectively logged RMZs ranging between 25 to 100 feet wide, along Type 1 through 3 Waters. The forest practices rules provide guidelines for determining the amount of logging that can occur within these RMZs and still maintain the appropriate shade levels. The rules also specify that trees be left along Type 4 Waters where such practices are necessary to protect public resources. There are no specific requirements, however, for protection of Type 5 Waters for the benefit of shade. It has been found that water temperatures in Type 4 and 5 Waters are more sensitive to changes in streamside shading than Type 1 through 3 Waters downstream (TFW Temperature Work Group 1990). Cumulative downstream effects of increased temperature in headwater tributaries have not been documented; however, it would be expected that, assuming similar amounts of ground water inflow into lower streams, the proportion of Type 4 and 5 Waters in a watershed may affect overall downstream water temperature sensitivity.

The riparian ecosystem microclimate will be modified due to the buffer widths described in the riparian conservation strategy of the draft HCP; however, the degree of modification will be mitigated to a large degree. Riparian ecosystem microclimate is the general environmental condition (i.e., air temperature, humidity, soil moisture, etc.) that exist in a forest along a stream. Microclimatic patterns vary with season, time of day, slope, aspect, and tree density. At least three factors will mitigate adverse modification of riparian microclimate.

First, wind buffers will be added to the riparian buffer in areas that are prone to windthrow. The wider buffer should partially mitigate adverse changes to soil and air temperature, soil moisture, relative humidity, wind speed, and radiation in the riparian ecosystem. Second, the distinct, well-defined edge at the boundary of the riparian buffer and clear-cut is temporary. After stand initiation and 20 to 30 years of forest growth, the microclimatic variables in the adjacent riparian ecosystem may be well within the range of natural variation. Therefore, adverse modification of riparian ecosystem microclimate may occur for less than half of each harvest rotation. Third, as mentioned previously, there are no reported measurements of the effects of timber management on the microclimate of riparian areas. It is reasonable to expect that the constant presence of flowing water and saturated soils will act to moderate any changes in microclimate due to edge effects.

c. BANK STABILITY

Summary: The USDA Natural Resources Conservation Service recommended that risk trees be removed to avoid erosion. The Washington Forest Protection Association recommended that DNR use the Washington Forest Practices Rules for bank stability. A local forestry company recommended the removal of risk trees to reduce sedimentation caused by windthrow and commented that this would enhance the recovery of fish. A local environmental group is concerned that use of ground-based equipment within 50 feet of streams may damage the root systems of the structurally important trees within 25 feet of the stream bank. An individual recommended that the 25 foot no-harvest zone be extended to 50 feet. One individual preferred Alternative C for extra protection of bank stability.

Response: The use of the term "risk trees" is based on a misplaced fear that trees toppled by bank undercutting or windthrow produce sediments that harm salmon habitat. This approach to riparian management does not recognize the natural dynamics of streams and riparian ecosystems. It is the intent of the HCP that streambank erosion processes be in a balance that is controlled by a naturally functioning watershed. Under these conditions, some erosion is expected as streams migrate across their floodplains. Therefore, site-specific risk trees are not considered to be a major concern.

The DNR is also concerned about the impact of "...ground based equipment ..." within the RMZs. Refer to the draft HCP, p. IV.62, for a discussion of stream stability and the 25-foot no-harvest area and for a discussion regarding root strength.

d. DETRITUS (litter)

Summary: Bogle & Gates (a consultant to Washington State University) stated that there has been an inadequate assessment of riparian zones in the No Action riparian management section of the Draft EIS. The Northwest Forestry Association questioned whether larger buffers are required to supply detritus, because detritus will be supplied by non-arboreal plants within a very short time after harvest. American Rivers Council commented that riparian areas affect the productivity of streams. A local forestry company said that hardwoods are an important source of detritus for aquatic ecosystems, and implied that converting to conifer loses these benefits.

Response: Riparian ecosystems are important for controlling many sources of productivity within the aquatic zone of streams. As is discussed in the draft HCP (p.III.57-58) and the DEIS (p. 4-145), riparian ecosystems encompass the aquatic environment and both the riparian and upland plant vegetation communities. A properly functioning riparian ecosystem includes the maintenance of cool clean water, stable stream banks, large woody debris, and detrital recruitment to the aquatic environment. Salmonid fish live within the aquatic environment from which they obtain the food and living space necessary for growth, reproduction, and survival. Each part of the aquatic environment has unique physical and biological characteristics and corresponding riparian elements that are also

unique. Riparian ecosystems directly and indirectly influence the quality of salmonid habitat.

The sources of detrital material are located throughout the riparian ecosystem. Non-arboreal plants are just one of many important sources of detritus that comes from the riparian ecosystem. Each source is important to the overall energy base of the aquatic environment, and ultimately the foodbase for rearing salmonids. The distance away from the stream from which leaf litter input originates depends on site-specific conditions. Thus, the effectiveness of floodplain riparian forests to deliver leaf and other particulate organic matter declines at distances greater than approximately one-half a tree height away from the channel (roughly 80 to 100 feet). Streamside vegetation provides large quantities of organic matter when leaves, needles, and woody debris fall or blow into the stream. In temperate regions, leaves and needles are shed in annual cycles, whereas woody debris enters the stream at irregular intervals as whole trees or branches are felled by wind and bank erosion (Bisson et al. 1987). Leaves and needles usually contribute most of the readily usable organic matter in woodland streams. Because leaves and needles of various species decay at different rates, they form a continuum from fast to slow decay. Red alder leaves, for example, decay at a faster rate than western hemlock and Douglas fir needles.

Hardwoods are an important source of detritus for streams, and these forests are dominant within the floodplains of rivers and streams. In most cases, hardwoods are the natural colonizing vegetation for streamside areas, and this is a process that would be maintained. However, on drier sites outside the floodplain, conifer stands are the dominant vegetative type and an important source of large woody debris recruitment for streams. The intent is to establish and maintain the original balance of hardwood and conifer that would naturally be found growing on the site, before human intervention.

One commentor states that "...the DEIS implies that the No Action riparian management zones are of insufficient width to supply detritus and an energy base to streams...and that...The DEIS cites no authority for this conclusion." The authority cited in the DEIS (p. 4-149) is FEMAT (1993), and this document points out that detrital input declines at distances greater than approximately one-half a tree height (roughly 80-100 feet) away from the channel (FEMAT, Figure V-12).

e. HYDROLOGIC MATURITY

Summary: The WDFW suggested that instream flow be addressed specifically in terms of "peak flows" and land-use practices that can be controlled, rather than "catastrophic events," or "floods." The NWIFC said that a strategy for maintaining hydrologically mature forests based on the assumptions used to develop the 1991 Washington State Forest Practices emergency rule for rain-on-snow is not scientifically justified or credible. The NWIFC pointed out that hydrologic effects caused by forest management outside the rain-on-snow zone may also have detrimental effects to salmonids, but admitted that the current level of research is not conclusive. They asked that this be acknowledged, and

asked DNR to acknowledge that future research may show that more protection is needed. The Point No Point Treaty Council said the emergency rule for rain-on-snow adopted by the Washington State Forest Practices Board in 1991 has not resulted in any appreciable conditioning of forest practices in rain-on-snow basins; therefore, DNR should develop a more meaningful hydrologic evaluation and protection strategy for rain-on-snow. The Tulalip Tribe also judged the 1991 emergency rule to be inadequate to protect against flooding due to rain-on-snow events. The Muckleshoot Indian Tribe believed that DNR's HCP should consider creation of new peaks of flow where none previously existed or increasing the duration of existing flows and the resultant impacts upon juvenile salmonids. The Muckleshoot Indian Tribe was concerned about the hydraulic simplification of stream channels (i.e., the loss of large woody debris, pools, and off-channel habitats) caused by altered hydro-regimes and other cumulative effects. They also said that the Draft EIS failed to consider the environmental impacts of the various exceptions to the rain-on-snow basin prescription, and they thought that basins less than 1,000 acres in size were also excepted from the strategy.

Bogle & Gates (a consultant to Washington State University) asked why the Washington Forest Practices Rules Watershed Analysis is inadequate. Northwest Ecosystem Alliance said, "In the discussion of rain-on-snow events, the criteria for identifying 'hydrologically mature' watersheds (25 years) is not scientifically defensible." They referred to the report cited in the Draft EIS (p. 4-171) which said that forests are only 50 percent recovered when 25 years old. WEC said that DNR should consider cumulative effects in the rain-dominated zone.

The Northwest Forestry Association said that there is a potential for legal challenges on the statement that "Two-thirds of the DNR-managed forest lands... shall be maintained in... hydrologically mature (forest) (in the rain on snow zone)." They said, "Can DNR meet this standard? We foresee an invitation to legal challenge if the percentage falls below 66 2/3 percent." The Northwest Forestry Association also said there needs to be a more complete discussion of forest hydrology, emphasizing the compatibility of forest harvest activities with proper water management. The Washington Forest Protection Association said that Alternative A and B are basically the same.

Another individual commented that the third exception to the basin hydrological maturity prescription was based on unstated and challengeable assumptions. He suggested dropping the whole thing. The same individual said that we need to the redefine the significant rain-on-snow zone to include the rain-dominated zone. Two individuals said that clearcutting of upper watersheds is bad. An individual stated that Alberta, Canada has fairly good evidence that the rate of flow in streams is significantly impacted by clear cuts in the upland. An individual asked for wider riparian reserves to reduce flooding, and another individual asked DNR to consider the hydrologic impacts on juvenile salmon.

Response: DNR and the Services acknowledge that hydrologic effects outside the significant rain-on-snow zone (defined as the snow-dominated and rain-on-

snow zones) may have detrimental effects on salmonid habitat. This is particularly true in the rain-dominated zone where rain-on-snow events may also occur. DNR chose not to address this issue because the general understanding of the relationships between forest hydrology outside of the rain-on-snow zone and adverse impacts to salmonid habitat is weak at this time. For this same reason, instream flow was not addressed specifically in terms of "peak flows", but rather was addressed in terms of the one hydrologic phenomenon which is known to cause significant damage to salmonid habitat, namely, rain-on-snow floods. DNR acknowledges that future research may show that better management of forest hydrology is needed to protect public resources.

DNR agrees that the Forest Practices Board 1991 emergency rule for rain-on-snow floods was inadequate to protect salmonid habitat. DNR's draft HCP greatly increases the level of protection provided by the emergency rule. Under the 1991 emergency rule, for a drainage basin completely within the significant rain-on-snow zone, if at least 1/3 of the basin was covered by hydrologically mature forest, then clear-cut timber harvest could proceed. Under DNR's draft HCP, at least 2/3 of the basin must be covered by hydrologically mature forest.

One objective of DNR's draft HCP riparian conservation strategy is to minimize the adverse impacts to salmonid habitat caused by rain-on-snow floods. DNR's strategy will alter DNR's forest management in the significant rain-on-snow zone. Over the short term, harvest rotations will increase from 60 years to greater than 75 years. Over the long term, DNR will use the Hydrologic Change Module of Watershed Analysis to develop drainage basin prescriptions for hydrologically mature forest. The Hydrologic Change Module of Watershed Analysis is not considered inadequate, but it is considered impractical, at least over the short term, because of the long time period necessary to complete the analysis of all DNR-managed lands in the five west-side planning units.

The report cited in the Draft EIS (p. 4-171) that stated that forests plantations are only 50 percent recovered when 25 years old was an interim report, and the statement attributed to this report was a speculation based on preliminary data (Harr et al. 1989). The final report, Coffin and Harr (1992), contains some of the best data available for comparing young plantation forests to late successional forests (i.e, mature forests older than 75 or 80 years) during rain-on-snow events, but the results are inconclusive. DNR's interpretation of this data is that 25 year old plantations are very close to hydrologic maturity with respect to rain-on-snow events. Coffin and Harr (1992) compared outflow measurements from paired young plantation and late successional forest plots during rain-on-snow events. There were 17 rain-on-snow events recorded from plantation plots that were 25 years old or younger. During 7 of these events (40 percent) the outflow from the plantation plot was less than or equal to the outflow from the late successional forest plot. During 30 percent (5 of 17) of these observations, the late successional forest actually produced a greater outflow.

There is no question that for the maintenance of natural flow regimes, late successional forests will behave more favorably toward salmonid habitat than

young plantation forests. But, for minimizing adverse impacts to salmon habitat during rain-on-snow events, using 25 years as the minimum forest age for hydrologic maturity with respect to rain-on-snow events seems a reasonable compromise. Twenty-five years is the minimum forest age, therefore, when a regulated forest condition is obtained, two-thirds of a drainage basin will be covered by forest between 25 years and 75 years old. Half the forest in the drainage basin will be older than 37 years.

The Draft EIS did fail to consider the environmental impacts of the various exceptions to the rain-on-snow basin prescription. A qualitative assessment of these exceptions follows. Basins less than 1000 acres are not excepted from the strategy. The draft HCP says that DNR will delineate drainage basins of approximately 1000 acres for the purposes of applying the strategy. The first exception is for drainage basins with less than 1/3 of their area in the significant rain-on-snow zone. This exception is based on the assumption that for small basins there exists some threshold proportion for area in the rain-on-snow zone below which special prescriptions are not necessary. Clearly, if only 1 percent of a small drainage basin is in the significant rain-on-snow zone then special prescriptions are not necessary. Choosing 1/3 as the threshold will result in some adverse impacts to salmon habitat, but these impacts are minimized to the extent practicable, but more importantly any adverse impacts will be less than those that might occur under Alternative A. The second exception is for drainage basins with greater than 2/3 of their area in the significant rain-on-snow zone covered by mature forest which is reasonably certain to remain that way. This exception is based on the same assumption as the first, and furthermore, this exception is thought to be a rare situation. As with the first exception, choosing 2/3 as the threshold will result in some adverse impacts to salmon habitat, but these impacts are minimized to the extent practicable, but more importantly, any adverse impacts will be less than those that might occur under Alternative A. Upon further consideration of the third exception, it was determined that adverse impacts to salmonid habitat were not minimized to the extent practicable. The third exception is modified as described below.

DNR agrees that the third exception is based on challengeable assumptions. In drainage basins where DNR manages less than half the area in the significant rain-on-snow zone and there is no reasonable assurance that other landowners will contribute hydrologically mature forest, there will not be an automatic exception to the basin hydrological maturity prescription. Instead, in such situations an interdisciplinary team of scientists will be convened to determine practicable basin level prescriptions for hydrologically mature forest.

DNR disagrees that there is a potential for legal challenges because of the draft HCP's strategy for hydrologically mature forest. DNR can meet this standard. Managing a drainage basin or landscape such that it is covered by specified percentages of various forest types and/or age classes is generally recognized as practical and desirable. A complete discussion of forest hydrology and water management is beyond the scope of the draft HCP and Draft EIS. The discussion of these topics in the draft HCP and Draft EIS are considered adequate for the

purposes of developing the conservation strategy and evaluating its environmental impacts.

9. Aquatic Habitats

a. Stream Classification

Summary: The NWIFC commented that not all streams typed after 1992 are correctly typed. The Muckleshoot Tribe said that to ensure that waters that seasonally support salmonids (intermittent streams) are not incorrectly typed as Type 4 Waters, the emphasis must be to demonstrate the lack of use rather than use. The Tulalip Tribe pointed out that past water typing maps significantly underestimate fish use. WEC asked DNR to justify the assumption that Type 4 Waters classified after January 1992 are correctly classified, and suggested that DNR adopt a standard protocol similar to Oregon's "Surveying Forest Streams for Fish Use." The Northwest Ecosystem Alliance suggests that DNR retype all streams. WEC wanted better verification of typing of Type 5 Waters. An individual suggested that a technical evaluation of the stream type system be conducted and any corrections made.

Response: DNR originally classified streams by the water types of Washington Forest Practices Rules using aerial photos and topographic maps. Given the enormity of the task, little field verification could be conducted. It has since been demonstrated that the classification error was, not surprisingly, quite high (Bahls and Ereth 1994). The stream classifications are considered provisional, and are continually revised.

The original stream type information was stored on paper, but DNR has transferred this information to its computerized geographic information system (GIS). This process was completed for western Washington waters in late 1991. Since the completion of the information transfer, all changes to the GIS data have been based on field classification. DNR thinks that it is reasonable to assume that the majority of streams that have been reclassified in the field are correctly classified.

Due to the high cost of a stream classification survey for all DNR-managed lands, it was decided that stream classification would occur on a sale-by-sale basis. When adequate staff and funds are available, DNR will verify the classification of many streams, regardless of their type, but the cost of committing to a program for reclassifying all streams is prohibitive.

DNR recognizes that the incorrect classification of streams as Type 5 Waters could result in a significant adverse impact to salmonid habitat. In order to avoid such impacts, the draft HCP has been modified as follows: A riparian buffer 100 feet wide shall be applied to both sides of Type 4 waters. Type 4 waters classified after January 1, 1992, are assumed to be correctly classified. Type 4 waters classified prior to January 1, 1992, must either have their classification verified in the field or be assumed to be Type 3 waters. In general it is currently standard practice for DNR staff to physically examine the classification of streams within a management unit when preparing the unit for a timber sale. If

an area has already been classified post 1992 and prior to the effective date of this HCP, it is likely in a management activity that is probably sold and or harvested. Therefore, for all practical purposes, stream typing will be examined or verified in the field whether they were typed before or after 1992.

b. EPHEMERAL/INTERMITTENT STREAMS

Summary: The WDFW said that the issue of leaving buffers along Type 5 Waters that are not in mass wasting areas has been left open to far too much subjectivity. They suggested an average buffer width or "pool of buffers" be available for site-specific use, especially on non-mass wasting prone Type 5 Waters.

The Muckleshoot Tribe said that we should develop a Type 5 Water management strategy in 5 years rather than 10 years. The NWIFC recommended that buffers should be wider on Type 4 and 5 Waters. The Point No Point Treaty Council suggested that DNR use Alternative C along Type 5 Waters. The Tulalip Tribe suggested that more protection be provided along Type 4 and 5 Waters. The Sierra Club and Rivers Council of Washington suggested that more protection be given to Type 5 Waters. The Mountaineers were concerned about the lack of immediate protection for Type 5 Waters until the interim research program is completed.

Bogle & Gates (a consultant to Washington State University) was concerned about the uncertainty of the HCP, because DNR commits to a research project which will lead to a long-term management strategy for Type 5 Waters. They said that this creates uncertainty, as the HCP is committing to do something based on research results not yet known. An individual wanted an additional 25 foot buffer on Type 5 Waters. An individual said that trees in Type 5 channels intercept precipitation and provide root cohesion to stabilize thick colluvium in topographic hollows and on steep channel banks and that logging in these areas can cause massive hillslope failure. He was pleased that the draft HCP proposes, "a method for delineating on a site-specific basis portions of hillslopes with a high risk of mass wasting will be described in agency procedures to be developed for this HCP." An individual said that Type 5 Waters are important. Three other individuals stressed the need to protect Type 4 and 5 Waters.

Response: The draft HCP policy with respect to protection of Type 5 Waters in the five west-side planning units outside the OESF states the following: (1) those streams crossing unstable portions of hillslopes will be protected (i.e., no timber harvest) to minimize potential for landslides and other mass-wasting activities, in accordance with the Washington Forest Practices Board Rules - WAC 222 (WFPB, 1995a); (2) those streams crossing stable ground will be protected, where necessary, for maintaining important elements of the aquatic ecosystem (e.g., water quality, fish habitat), in accordance with the Forest Resource Plan (DNR, 1992); and (3) an aggressive, 10-year research program will be established to gain better scientific and management knowledge of the physical and biological processes active in Type 5 Waters and their requirements for protection from land-management disturbances, with particular emphasis on

Type 5 channels crossing stable ground. Needs for verifying stream typing, including validation of Type 5 classifications, are discussed in the comment summary "Stream Classification".

The DNR recognizes that insufficient data currently exists for accurately predicting the size, shape, and forest-stand structures necessary to protect physical and biological functions of Type 5 streams on a site-specific basis. Hence, the purpose of the research program is to develop sound strategies that will ensure adequate, long-term protection of Type 5 Waters on both stable and unstable ground while ascertaining what level of commercial timber harvest might occur in these areas. The DNR chose a period of 10 years for this research program as being long enough to obtain measurable, meaningful results and short enough to ensure that results are incorporated in management strategies in the near-term. The DNR is concerned that some trends in resource conditions might not be observable over a period less than a decade and that it might take longer than a few years (e.g., 5 years) to obtain statistically valid results on which to build a long-term conservation strategy. The DNR fully intends, however, to incorporate sound research whenever it becomes available, as part of the draft HCP adaptive-management approach. Hence, management strategies may be modified anytime during the 10-year period or thereafter, based on sound research results derived from any source (i.e., DNR or other entity).

The DNR contends that this approach is no more subjective or uncertain, and is in many regards more proactive, than present treatment of Type 5 Waters crossing stable ground on state lands. Currently, these streams receive no protection under the Washington Forest Practices Board rules - WAC 222 (WFPB, 1995a), and there is no direction in the Washington Forest Practices Board watershed-analysis manual (WFPB, 1995b) for assessing physical or biological conditions, or prescribing forest-management activities, in such areas. Hence, they infrequently are treated during the watershed-analysis process. Type 5 Waters crossing stable ground might be evaluated during TFW Interdisciplinary (ID) team visits to specific sites; however, these visits often are limited to the area encompassed by a proposed timber sale, such that the physical connectivity and biological importance of these streams to the rest of the channel network might be missed. In addition, ID-team visits have occurred only on a fraction of DNR state lands.

The draft HCP strategy acknowledges that Type 5 Waters crossing stable ground are important elements of aquatic and riparian systems, and that steps should be taken on state lands to develop an explicit strategy for their physical and ecological maintenance, which would provide operational certainty for management activities and environmental protection in the long term. Given that there are no predictive methods or models for accurately prescribing riparian buffers on Type 5 Waters occupying stable ground, DNR believes that applied research and adaptive management are the best strategies for developing buffer configurations that meet long-term management and conservation requirements at the site-specific and landscape scales. A goal of the research program is to better understand the connectivity of Type 5 Waters to the rest of the channel

network (i.e., landscape-scale approach), in addition to delineating site-specific requirements for resource protection and opportunities for commercial timber extraction. The intent of the research and adaptive-management program is to determine what should be protected and how it should be protected on all state lands in western Washington, rather than setting an arbitrary buffer width that might under-protect or over-protect physical and ecological functions on any given Type 5 Water. In addition, using a systematic scientific approach yielding reproducible results, rather than arbitrarily designating buffer widths, provides assurance to DNR's trust beneficiaries, other affected parties, and the public that DNR is developing and using the best information available in its management practices. Therefore, DNR's research program strives for long-term certainty and objectivity in management and conservation practices. In the interim, DNR will continue to evaluate Type 5 streams using available methods and qualified staff, and placing additional protection where necessary, as mandated by the Forest Resource Plan (DNR, 1992).

The scientific rationale for buffer widths is presented in the draft HCP and DEIS. The DEIS specifically discusses physical and ecological evidence in support of the proposed buffer widths, as well as holes in the collective knowledge of ecosystem functions and their requirements for protection and restoration. Current land-management and conservation strategies must grapple with the fact that there is a lack of absolute scientific certainty with regard to exactly how wide buffers must be to protect Type 4 and 5 Waters on stable ground. Consequently, DNR proposed several alternatives for buffer widths in the five west-side planning units outside the OESF. The Board of Natural Resources directed the agency to choose the alternative presented in the draft HCP (i.e., Alternative B) as the one to best balance the trust obligations to produce revenue from timber harvest with the need to provide properly functioning aquatic and riparian ecosystems. The Board also concurred with the need for adaptive management to modify conservation strategies over time as new information becomes available.

For Type 4 and 5 Waters crossing unstable ground, buffers will be as wide as necessary to incorporate existing and potential areas of hillslope failure, or will ascribe to the buffer widths proposed in the draft HCP, whichever is wider. This ensures that both physical and biological factors are considered in buffer designs. Within the OESF, approximately 90 percent of Type 5 Waters occupy unstable ground. While statistics have not been compiled for the five west-side planning units outside of the OESF, DNR scientists expect that areas with comparable terrain characteristics (e.g., flanks of the Cascades Range, steeper ground in NW and SW Washington) will display similar statistics once appropriate analyses have been performed.

The relationship between the position of Type 5 channels and topographic hollows or channel-bank seeps is recognized by DNR and discussed in the draft HCP and DEIS (in particular, see sections on the OESF Riparian Conservation Strategy). The DNR has committed to the USFWS and NMFS that qualified staff (i.e., those trained to conduct sound qualitative and quantitative analyses of

slope-failure potential) will perform field and analytical evaluations of areas prone to hillslope failure. Staff will use the best field and analytical methods available to evaluate the potential for forest-management practices to destabilize channel walls and heads, as well as areas physically connected to Type 5 channels (e.g., zero-order basins, forested wetlands). DNR staff are aware of modeling work being done by faculty, postdocs, and students at the University of Washington, as well as at other national and foreign (e.g., Australian) institutions, and intend to make use of whatever applicable models are developed, once they become available to the agency.

Concerns have been expressed by a number of reviewers over the use of a slope-morphology model (Shaw and Johnson, 1995) to assist with field reconnaissance of potentially unstable areas. These concerns include the fact that this model only addresses debris avalanches (i.e., shallow, rapid landslides) and not deep-seated failures or debris-flow runout, and that the model has not been tested adequately outside of the Olympic Peninsula. The DNR refers the reader to the model description (Shaw and Johnson, 1995), in which these and other model limitations are discussed in detail. The DNR does not intend for this model to supplant other, more sophisticated models dealing with either form of landslide behavior. At the time of the draft HCP writing, however, other models (e.g., Miller, 1995) were not available to the agency. This slope-morphology model currently is being tested in its capability to flag areas of debris-avalanche potential outside the Olympic Peninsula. The original intent of the reference was to suggest that this model is one of several that could be used as a preliminary flagging tool to assist field reconnaissances of slope stability. This model will not be used, nor should any other theoretical model, as a substitute for detailed field evaluations of debris-avalanche potential.

c. INNER GORGES

Summary: The Tulalip Tribe stated that there is a need for protection from debris flows.

Response: DNR and the Services recognize the dynamic and catastrophic nature of debris flows emanating from landslide sites and inner-gorge areas. Concerns have been raised over a slope-morphology model currently used by DNR and others as a preliminary screening tool in certain regions of the state (Shaw and Johnson, 1995). The discussion in the draft HCP will be clarified to indicate that this model was not designed to address debris-flow runout or forms of landslide behavior other than debris avalanches. Hence, DNR never intended to use this model for the purpose of evaluating debris flows. Rather, DNR has committed to the USFWS and NMFS that qualified staff (i.e., those trained to conduct sound qualitative and quantitative analyses of slope-failure potential) will perform field and analytical evaluations of areas prone to hillslope failure. A complete, defensible, scientific analysis of hillslope failure should include an evaluation of the potential for a debris avalanche or other slope failure to precipitate a debris flow, as well as an analysis of the potential for and extent of debris-flow runout in the downslope and cross-slope directions (e.g., as per the minimum standards set forth by the Washington Forest Practices Board watershed-analysis manual

(WFPB, 1995b)). It is expected that "qualified staff" should be able to conduct such analyses, as well as remain trained in the best field and analytical methods available to evaluate the potential for forest-management practices to destabilize hillslopes and channel margins.

10. Aquatic Habitat Components

a. Large woody debris

Summary: The NWIFC asked what is the scientific justification for using the height of trees "of a 'mature' conifer (100 years old)" to delineate the width of the riparian buffer. The NWIFC also asked about "age at breast height." They wanted to know if age varies along different heights of a tree bole. The Point No Point Tribe asked for an explanation of the basis for the riparian buffer widths. The Hoh Indian Tribe said that large woody debris is recruited from upslope outside the buffer.

The Northwest Ecosystem Alliance stated, "According to research conducted by McDade and others (1990), 95 percent of large wood recruited into streams originates within 100 feet of the channel." Based on this citation, they request that the riparian buffer width be one site-potential tree height or 100 foot, whichever is greater, and that this buffer be applied to all stream types.

Bogle & Gates (a consultant to Washington State University) asked why the No Action alternative is inadequate to provide large woody debris, and stated that the wind buffers would actually slow the rate of large woody debris inputs. An individual said that large trees are a crucial element in all channels. A local environmental group said that narrow buffers that don't include all large woody debris sources may take away important sources of large woody debris, and may end up damaging fish habitat. An individual pointed out that Type 4 Waters in steep bedrock channels need large woody debris larger than 2 meters diameter, and therefore, he believed that there is a need to increase buffer widths to a site-potential tree height along Type 4 streams. An individual said that large trees stabilize large woody debris jams.

Response: The scientific justification for the riparian buffer width is given on p. III.63 and p. IV.59 to 61 in the draft HCP.

DNR agrees with the observation that on very steep slopes large woody debris can be recruited from distances beyond one site-potential tree height, i.e., from the riparian buffer. The draft HCP has been modified so that riparian buffer widths are measured horizontally. On very steep slopes, this modification should cause the riparian buffer to capture more trees that may slide into streams.

The No Action alternative is inadequate to provide large woody debris because the average buffer widths currently applied by DNR on Type 3 and Type 4 Waters average 85 and 55 feet, respectively. The scientific justification for the riparian buffer width on p. III.63 and p. IV.59 to 61 in the draft HCP indicates why this is inadequate. The purpose of wind buffers is to limit windthrow in the riparian ecosystem to a level which approximates windthrow in an unmanaged

riparian ecosystem. This input can be both gradual and catastrophic, but in most cases it is metered out over the long term at a rate of approximately 1-2 percent input per year (Grette 1985).

The riparian buffer width on Type 1, 2, and 3 Waters is based on the site-potential height of trees in a mature conifer stand (100 years old). This prescription does not specify the age or size of conifer trees in the riparian buffer. One objective of the riparian strategy is "to provide the quantity and quality of instream large woody debris that approximates that provided by unmanaged riparian ecosystems" (draft HCP p. IV.60). To meet this objective, some old large conifer must be retained in riparian buffer.

The difference between total tree age and the age at breast height, as measured by a count of tree rings using an increment borer, can be as much as four to eight years. So, a tree that is 100 years at breast height may have a total age of about 106 years, plus or minus a few years.

b. SUBSTRATE (SEDIMENT)

Summary: The WDFW asked that the following be added to Chapter III of the draft HCP: "The long overwinter incubation and development for bull trout and other salmonids leave them vulnerable to increases in fine sediments and degradation of water quality (Fraley and Shepard 1989). Embryonic salmonid survival has been shown to be inversely related to the percent of fine material less than 6.35 mm (0.25 in.) in gravel (Watson 1991). Survival to emergence ranged from nearly 50 percent in substrate containing 10 percent fines, to zero survival in mixtures which contained 50 percent fines (Weaver and White 1985)." The NWIFC stated that large woody debris stores sediment in small streams.

Response: The adverse effects of sediments on salmonids is widely recognized, and a general description of these adverse impacts is given on p. III.56 through p. III.59 of the draft HCP. Although valuable for many purposes, the highly detailed information presented by WDFW was not considered useful for the development of a riparian conservation strategy. Information regarding sediments which was useful for the development of a riparian conservation strategy appears on p. III.61 through p. III.66 and on p. IV.59 through p. IV.63 of the draft HCP.

The draft HCP discusses the general functions of large woody debris on p. III.60 and on pp. III.62 - III.63.

c. CHANNEL MIGRATION & MORPHOLOGY

Summary: The Hoh Tribe said that there is a need for a better delineation of channels. The NWIFC, Point No Point Indian Tribe, Tulalip Tribe, Sierra Club, Northwest Ecosystem Alliance, The Rivers Council of Washington, and one individual all recommended that the term "migration zone" be used instead of "active channel". WECsuggested that DNR adopt the approach employed in the Riparian Function Module of the Washington Forest Practices Watershed

Analysis manual to identify and map channel migration zones (CMZ) and then measure the RMZ from the outer margin of the identified CMZ.

A local environmental group and a large number of individuals (51) said that buffer measurements should be adjusted for topography. An individual said that Type 4 Waters should be analyzed for 100 year floodplain migration patterns. An individual said that additional buffer width should be added to account for channel migration.

Response: The DNR has committed to the USFWS and NMFS that all riparian-buffer measurements will be made beginning from the outer margin of the channel-migration zone. The channel-migration zone includes side channels or braided channels that are abandoned seasonally during low-flow discharges on the mainstem river, or are abandoned temporarily via channel avulsions. The term "channel-migration zone" is synonymous with the definition of "active channel" provided in the draft HCP: "... the active channel margins might encompass side channels and adjacent floodplain areas that transport water during wetter parts of the year ... [The active channel] might also include: (1) braided channels, (2) mid-channel bars, (3) side channels occupied during frequent flooding, and (4) portions of the floodplain nearest the channel..." (draft HCP, p. IV.53 and 54). The channel-migration zone might correspond to the 100-year floodplain in low-gradient, alluvial systems, or it might coincide with the channel high-water mark in high-gradient systems. Identifying the channel-migration zone will require that all stream channels are delineated clearly. If DNR desires to do something different in a specific case, an alternative proposal will be made and reviewed with the USFWS and NMFS. The draft HCP will be edited to reflect this decision.

In regard to applying methods described in the Washington Forest Practices Board Watershed Analysis manual (WFPB 1995b) for identifying and mapping channel-migration zones, it is likely that such methods would form the basis for delineation of channel-migration zones on state lands covered by the draft HCP. The methods described in Version 3.0 of the Riparian-Function Module are very generalized (i.e., no stepwise procedure or details of analytical requirements given) and are the basic components of any geomorphic analysis of changes in river plan-form over time. In addition, the directions largely leave the details of delineating channel-migration zones up to the analyst. Hence, it is likely that an analysis of channel-migration zones under the auspices of the HCP would follow similar procedures, given that the manual directions do not provide many specifics.

The draft HCP and DEIS indicate that riparian buffers will be adjusted on the ground to reflect topographic relief and site-specific considerations (e.g., local sites of mass wasting and channel-bank failure, large woody debris recruitment). The DNR recognizes that riparian buffers must be tailored to local site conditions if they are to successfully protect physical and biological functions of riparian areas (see draft HCP, p. IV.55 and 97, for further discussion).

d. OFF-CHANNEL HABITATS

Summary: The Muckleshoot Tribe stated that wetlands that function as rearing habitat for salmonids should be protected in addition to wetland hydrology. The NWIFC requested a discussion of "wall-base channels" as salmon habitat, and said it is unclear what kind of protection these habitats would receive under the draft HCP.

Response: The main objective for the development of the wetland conservation strategy was to maintain hydrologic function, but the strategy for wetlands should adequately maintain the salmonid rearing habitat function of wetlands as well. Wall-base channels that are classified as Type 1, 2, 3, or 4 Waters or as wetlands would receive the protection described in the draft HCP. A discussion of wall-base channels will be added to the final HCP.

11. Retention of Structural Legacies

Summary: WDFW, NWIFC, Point No Point Treaty Council, the National Audubon Society, Sierra Club, and at least two individuals commented on some aspect of the retention of structural legacies. WDFW stated that the retention of large, structurally unique trees is commendable. WDFW recommended that more green trees and at least 4 snags per acre that are greater than 20 inches dbh be retained in clearcuts. WDFW also recommended that priority for retention be given to large hollow snags, and that DNR engage in research to create snags in young managed stands. The NWIFC and Point No Point Treaty Council recommended that more snags and logs be retained in clearcuts. The Point No Point Treaty Council recommended that large logs be retained, "e.g., 20 inches in diameter and 20 feet long." They also asked whether the retention of very large, structurally unique trees is in addition to the Washington Forest Practices Rules or substituting for it. The NWIFC claimed that the provisions for snag, log, and green tree retention were minimum Washington Forest Practices Rules and that these must be improved upon in an HCP. The other commentors stated that the provisions for the retention of snags and logs were inadequate.

Response: The HCP contains a provision to retain two live trees per acre of harvest according to state Forest Practices Rules, however, DNR has committed to retaining one of these trees from the largest diameter size class of living tree in the harvest unit. A preference will be shown for large, structurally unique trees that would be valuable to wildlife but these would substitute for the required green retention trees, not be in addition to this requirement. The Services and DNR recognize the importance and need to retain an adequate amount of snags and down logs for wildlife, and to retain a sufficient amount of green trees to function as snags in the future. In response to public comment and concerns of the Services, the strategy for structural legacies has been strengthened (draft HCP, Chapter IV, Section F and Appendix 3, Chapter IV, Section F of this document). DNR will retain 3 additional codominant green trees or, as a result of leave-tree clumping, a preference will be shown for intermediate shade-tolerant trees. Although not required by state Forest Practices Rules, DNR will leave 3 snags ≥20" dbh where possible with a minimum dbh of 15". Where snags at least 15" dbh are not available, a one for one replacement will be made with green trees. Preference will be shown for hard snags, and large

hollow snags ≥40 feet in height. All leave trees will be left in the harvest unit and through subsequent rotations. The riparian and wetland buffers, and murrelet habitat will also be a source of large trees with structure, and snags and down wood beneficial to wildlife. In addition, the owl NRF management areas contain a provision to ensure a minimum of 5 percent ground cover of large woody debris which is interim in nature and will be refined with the prevailing science which should ensure an adequate amount of large down logs (draft HCP, p. IV.10). The Services and DNR believe that the owl, murrelet and riparian conservation strategies, as well as these additional provisions for structural legacies will provide an adequate amount of current and future snags for primary and secondary cavity nesters, and down logs for small mammals, amphibians and other wildlife.

12. Landscape Planning

Summary: The NWIFC said that the landscape assessment for NRF Management Areas and DNR's Landscape Planning were poorly defined. They expressed concerns that DNR's landscape planning may not adequately protect natural resources such as salmon. The Elwha/Clallam Tribe said the Clallam Landscape Plan was one of the best plans they've been involved in.

Response: The process for DNR's Landscape Planning is still under development. DNR's Landscape Planning must prescribe management that conforms to the conservation strategies described in the HCP. These conservation strategies are sufficient to satisfy Section 10 of the ESA, and overall provide better conservation of natural resources than Alternative A.

a. Forest Fragmentation

Summary: There were 10 comments on issues related to forest fragmentation. The Point No Point Treaty Council asked that the areas designated for providing connectivity between non-contiguous federal lands be delineated in the HCP. The Washington Wilderness Coalition suggested that connectivity be improved by placing new spotted owl NRF habitat adjacent to old NRF habitat. One local organization and one individual emphasized the need for connective habitat. The National Audubon Society, the Sierra Club, Washington Environmental Council, Rivers Council of Washington, 3 local environmental organizations, and one individual believe that DNR's draft HCP multispecies strategy is inadequate for interior late successional forest species. The majority of such comments questioned the habitat value of riparian buffers for interior late successional forest species.

Response: The owl conservation strategy proposed in the HCP contains DNR-managed lands designated as NRF habitat and as dispersal habitat. These designated lands are clearly shown on the maps of each planning unit, exclusive of the OESF Planning Unit (draft HCP Maps IV.1 through 8). The dispersal habitat areas were located where DNR-managed lands were in areas considered important to owl dispersal, where they would provide connectivity to federal lands, and where they were not already designated as NRF management areas. These designated disperal habitat areas that serve to provide some connectivity between non-contiguous federal lands are most notable in the area north of Hwy.

20 in the North Puget Planning Unit, near the I-90 corridor and in the Mineral Block of the South Puget Planning Unit, on the southern edge of the Columbia Planning Unit and from north to south throughout the Klickitat Planning Unit. The latter of which serves to provide connectivity between the Yakama Indian Reservation and federal lands in Oregon. Connectivity in NRF management areas could be improved for species other than the owl that are less mobile by placing new NRF habitat next to old NRF habitat. However, the design of NRF-designated areas is such that the 300-acre nest patches are the only stands that will be providing the nesting function, i.e. will be old forest. Once these patches are in place, no new NRF will be grown. There will be 200 acres of sub-mature or better stands that, although dynamic, will be contiguous with the 300-acre nest patch. The NRF management areas will contain 50 percent sub-mature habitat or better that, except for the 300-acre patch, will move around the WAU. At various times, this acreage will be contiguous with adjacent federal reserves and riparian management zones, thus providing some connectivity throughout the landscape. The riparian buffers on all Type 1-4 streams, and on steep and unstable slopes along Type 4 and 5 streams will also serve to provide connectivity to adjacent forest stands of various ages. Concerns have been raised about the ability of the HCP conservation strategies to adequately provide interior late successional forest. This habitat type will be limited in certain areas of the HCP, such as the South Coast Planning Unit. However, it is anticipated that some late successional interior forest will be protected in this planning unit by the murrelet conservation strategy even after the long-term plan is developed. In the OESF, the combination of the owl and murrelet strategies will also provide some late successional forest. The goals of OESF owl strategy are to retain old forest stands, most of which is old growth, or develop these stands such that they constitute 20 percent of each OESF planning unit. These stands will, at various times, be adjacent to stands that are young forest marginal or better. Although the younger stands can not substitute for interior late successional forest, the buffering effect of these stands may contribute to more of the old forest stands functioning as interior late successional forest habitat. For example, as the younger stands reach 40-60 years they may be of a height and density that contribute to the maintenance of interior late successional microclimate. It is anticipated that the 300-acre nest patches in the other west-side planning units will also provide interior late successional forest when buffered by adjacent sub-mature or better stands, and late successional stands on adjacent federal lands. It is not expected that the riparian buffers will provide interior late successional habitat in and of themselves but will likely contribute to providing this habitat type where the buffers are contiguous with steep and unstable slopes, murrelet habitat, and owl NRF habitat. Although there will not be an abundance of interior late successional forest habitat on DNR-managed lands in the HCP area, it will be more than what would occur if DNR's HCP were not implemented.

13. Habitat-based Approach

Summary: The Washington Environmental Council, The Mountaineers, and a local organization questioned whether a multispecies conservation strategy based on conservation for the spotted owl, marbled murrelet, and salmon could provide adequate protection for the habitats of all other species.

Response: Conservation strategies for habitat types other than those provided for and protected under the owl, murrelet, and salmon (riparian ecosystem) strategies include: talus, caves, cliffs, oak woodlands, wetlands including seeps and mineral springs, snags, and very large, trees. Protection of these "uncommon habitats" is detailed in draft HCP, Chapter IV, Section F. The special protection of these habitats are considered necessary by DNR to provide conservation for unlisted species. The intent of DNR's HCP strategy is to provide habitat that helps to maintain the geographic distribution of unlisted species that have small annual or breeding-season home range (<1 mile), to provide habitat that contributes to the demographic support of populations of unlisted species with large home ranges (>1 mile) on federal reserves, and to provide habitat that can facilitate the dispersal of wide-ranging species among federal reserves.

The conservation strategies for salmonids and marbled murrelets should "reduce the risk of extinction of many unlisted species, in particular those that have small home ranges and depend on riparian/wetland ecosystems or late successional forests." The spotted owl strategy positions large landscapes of mature and old-growth forests within 2 miles of federal reserves. Wide-ranging species on federal lands will benefit from conservation strategies in the HCP due to the proximity of these HCP reserves to federal lands.

It is expected that the conservation measures proposed in DNR's HCP will provide some protection for all the habitat types that exist on DNR-managed lands. The habitat-based approach of DNR's HCP will be further analyzed in the Service's Section 10 findings document prior to a decision on permit issuance or approval of the Implementation Agreement.

14. Unique Forest Types (No comments received except for additional Tribal comments in Section 3.3.)

C. PLANTS

Summary: Bogle & Gates (a consultant to Washington State University) claimed that adequate protection for plants is already provided by current regulations and DNR's policies and guidelines. NCASI noted that the activities described for the OESF might reveal how to provide satisfactory habitat for late successional and old-growth plant species in a managed forest. Northwest Ecosystem Alliance requested more protection for wetlands because of the large number of plants species associated with them. The Washington Native Plant Society asserted that the HCP should meet the requirement of the Endangered Species Act, Section 19(a)(1)(B), that "the taking will not appreciably reduce the likelihood of the survival of the species in the wild." They recommended that Alternative C be selected because of its additional protection for riparian and wetland ecosystems. Furthermore, the Washington Native Plant Society recommended that DNR plan to discover and monitor populations of listed or candidate plants. An individual suggested the Endangered Species Act be amended to provide the same protection to plants as is provided for animals. Another individual pointed out that swamp sandwort is an indicator plant and expressed concern about changes in the species' distribution.

Response: There are no management strategies for endangered, threatened, or sensitive plant species in the HCP. There are no take prohibitions for federally listed plant species on nonfederal lands. Therefore, USFWS does not issue incidental take permits for plants. However, the Services through the Section 7 consultation process must ensure that the action of issuing an ITP will not jeopardize any federally listed plant species. For that reason, the Services encourage applicants to consider listed and sensitive plant species during the HCP development.

The management of plant species will be consistent with Policy No. 23 of the Forest Resource Plan which directs DNR to "participate in efforts to recover and restore endangered and threatened species to the extent that such participation is consistent with trust obligations."

Amendments to the ESA are beyond the scope of the proposed action. Swamp sandwort (*Arenaria paludicola*) is addressed in the draft HCP (p. IV.163) and the Draft EIS (p. 4-449).

D. ANIMALS

1. Wildlife

Summary: WDFW, NWIFC, Point No Point Treaty Council, Tulalip Tribes, Yakama Indian Nation, Bogle & Gates (a consultant to Washington State University), the National Audubon Society, NCASI, Washington Environmental Council, The Mountaineers, League of Women Voters, 5 local environmental organizations, 1 wood products company, and 67 individuals commented on general wildlife issues. Four of the comments were presented at public hearings. Fifty-one individuals, who used an identical form letter, stated that DNR's draft HCP harms wildlife. WDFW was concerned about the lack of discussion on limiting factors, impacts, and mitigation for the hundreds of species which could be listed in the future. NWIFC believed that the measures for wildlife habitat outside of riparian ecosystems, spotted owl habitat management areas, and marbled murrelet habitat are only minimum Washington Forest Practices Rules. Point No Point Treaty Council expressed concern about the effect of high road densities on wildlife. The Tulalip Tribes recommended that to assure the continued health and productivity of native wildlife, DNR's HCP should restore natural functions of the forest on all lands managed by DNR. The Yakama Indian Nation suggested that Alternative C is closer to the level of mitigation that they expect in exchange for incidental take and unlisted species agreements. Bogle & gates (a consultant to Washington State University) claimed that adequate protection for wildlife is already provided by current regulations and DNR's policies and guidelines, and wanted to know the expected cost of the mitigation measures proposed in the multispecies strategy of the draft HCP. The Washington Environmental Council, The Mountaineers, and a local organization said that there is no evidence that DNR's draft HCP multispecies conservation strategy will work. Ten commentors, including the National Audubon Society, The Mountaineers, Washington Environmental Council, and League of Women Voters, asserted that, given the many uncertainties surrounding wildlife conservation, DNR's HCP should be conservative, i.e., "err on the side of species conservation." One individual commented that because it covers such a significant portion of public lands, DNR's HCP must provide greater protection. Four individuals believe that

both Alternatives B and C have the potential to result in the extinction of species that may be listed in the future. An individual states that riparian areas are important for biodiversity. NCASI noted that the activities described for the OESF might reveal how to provide satisfactory habitat for late successional and old-growth wildlife in a managed forest. A wood products company is not opposed to protection of fish and wildlife unless it is unnecessarily destructive to other aspects of quality of life. One individual stated that wildlife concerns should not subjugate the long standing principles of management placed upon DNR by state legislation. Another individual was concerned about effects on small landowners from the reintroduction of listed species. Another individual claimed that wildlife issues were being misrepresented for social/political motives. Specifically, this individual wrote that the set aside, no management approach is wrong.

Response: DNR can not justify an HCP which attempts to restore all "natural functions" of the forest on all lands managed by DNR. DNR has a duty to produce the most substantial support possible over the long term to the trusts while complying with all state and federal regulations. DNR's HCP is intended to comply with the federal Endangered Species Act and provide DNR with long-term regulatory certainty. DNR's HCP will restore or maintain many functions of riparian and wetland ecosystems and will protect uncommon wildlife habitats such as talus, caves, and cliffs. Futhermore, DNR's HCP should make an important contribution toward maintaining the geographic distribution of species with small home ranges and support the conservtion efforts on federal lands for species with large home ranges.

The HCP is the principle document supporting DNR's application for incidental take permits and unlisted species agreements. The Services can issue incidental take permits and unlisted species agreements only if the HCP satisfies the criteria listed in Section 10 of the ESA. The overall multispecies conservation strategy of the proposed HCP is designed to provide sufficient protection of all the habitat types found on DNR-managed land to meet Section 10 needs. Through negotiations, DNR and the Services have agreed to modifications of the draft HCP which will improve habitat protection for many species of wildlife. These modifications pertain to snag and green tree retention, talus, cliffs, balds, and springs and seeps.

A discussion on limiting factors, impacts, and mitigation for the hundreds of species which could be listed in the future would be an enormous and unreasonable task. In order to simplify this task, DNR has used a "habitat-based" approach for its multispecies conservation strategy. The draft HCP describes the general landscape conditions that will develop on DNR-managed lands over the term of the HCP (draft HCP p. IV.135 through p. IV.138 and in Appendix 3. Table IV.14 of this document) and describes the special protection that will be given to uncommon habitats (p. IV.139 through p. IV.143). Based on these descriptions, the draft HCP then assesses the conservation of species of concern (draft HCP p. IV.145 through 156 and Appendix 3, Chapter IV, Section F of this document). Species of concern are defined as federal candidates (formerly category 1 candidates), federal species of concern (formerly category 2 candidates), state-listed species that are not federally listed, and state candidates. Many of these species of concern could well be described as indicator or umbrella species, and therefore, it is reasonable to assume that providing

habitat for these species will provide habitat for many other species sensitive to habitat degradation. The Service will provide further discussion of the HCP effects and mitigation in its Section 10 findings document prior to a decision on permit issuance or approval of the Implementation Agreement.

Early in the development of DNR's HCP, the Services conveyed to DNR their belief that current Washington Forest Practices Rules for the protection of wildlife habitat could not satisfy the Section 10 criteria. The Forest Resource Plan is a policy document. It was approved in 1992, but has yet to be fully implemented. Implementation of the Forest Resource Plan policies requires the development of specific management guidelines. The draft HCP presents management guidelines which implements portions of the Forest Resource Plan. Furthermore, the Forest Resource Plan is thoroughly inadequate for issuance of an ITP or unlisted species agreement. It does not contain the degree of management guidance required by the Services for an HCP.

High road densities can be detrimental to fish and wildlife populations. Road construction and use are activities necessary for forest management. In order to minimize the adverse impacts of roads on fish and wildlife, DNR will develop comprehensive landscape-based road network management plans.

The cost of the mitigation measures proposed in the multispecies strategy of the HCP -- such as protection of uncommon habitats, snag and green tree retention, protection of nest sites for certain sensitive species, etc. -- are expected to be minimal compared to DNR's enhanced ability to produce revenue because of the regulatory certainty provided by incidental take permits and unlisted species agreements.

DNR's HCP will reduce the amount of habitat available to some species, but focuses on enhancing protection and recovery efforts on federal lands. It is very unlikely that either Alternatives B or C will result in the extinction of species that may be listed in the future. See the response under the heading Old-Growth Habitat for an explantion.

The reintroduction of listed species is not a part of DNR's draft HCP.

The protection of wildlife habitat is a contentious issue. The foundation of sound, politically unbiased natural resource management is credible, objective science. DNR's HCP is based on the best available scientific information and has been reviewed by qualified scientists from outside the department. For some threatened or endangered species, such as the marbled murrelet, there is a high degree of uncertainty about population sizes and rates of population change. In such cases DNR has proposed a conservative approach to habitat management.

a. MAMMALS

i. Bats

Summary: WDFW said that lack of snags in certain regions may lead to low populations of bats. Point No Point Treaty Council recommended that DNR participate in data collection on myotis bats. Bogle & Gates (a consultant to Washington State University) wanted to know the impact on harvesting of the

mitigation measures for bats. An individual urged DNR to take steps to identify bat roosts prior to logging and to protect caves. Another individual recommends protecting sensitive species like bats everywhere they occur, not just in a few patches of owl nesting habitat.

Response: Although data on bat colonies in the Pacific Northwest is scant, it is generally known that myotis bats and Townsend's big-eared bats primarily use caves for maternity roosts and hibercula. Most myotis bats also use fissures in the bark of large trees as solitary roosts or, in the case of long-legged bats, as maternity roosts. DNR's HCP will afford protection of large trees and snags in the owl NRF-designated areas, in riparian and wetland buffers, and with the strengthened snag and green tree retention measures (draft HCP, Chapter IV, Section F and Appendix 3, Chapter IV, Section F of this document) which will provide and protect potential bat roost sites. However, the preservation and conservation of bat roosts, especially caves, is probably the most important issue in bat conservation. Under the HCP, caves important to wildlife, determined in cooperation with USFWS, will be protected with no-harvest buffers and distance restrictions on road construction near caves. In addition, the location of caves will be kept confidential. This provision is important because cave-dwelling bats are especially sensitive to direct human disturbance, such as cave entry. These measures should serve to adequately protect bat habitat without conducting surveys.

ii. Other Small Animals

Summary: The Point No Point Treaty Council, Northwest Ecosystem Alliance, and one individual commented on small mammals. The Point No Point Treaty Council pointed out that big logs are a component of small mammal habitat, and that small mammals serve as a prey base for predators. An individual also noted that small mammals provide food for predators. The Northwest Ecosystem Alliance requested more protection for riparian and wetland areas because 20 species of small mammal are either obligate riparian or wetland inhabitants.

Response: In addition to the down logs required by state Forest Practices Rules, it is expected that the additional snags and green trees that DNR has committed to provide will also be a source of down logs some time in the future (draft HCP, Chapter IV, Section F and Appendix 3, Chapter IV, Section F of this document). Not all the large and structurally unique trees, nor the codominant green trees will remain standing. Some of these trees will blow down and become large logs providing habitat for small mammals. In addition, the owl NRF management areas contain a provision to ensure a minimum of 5 percent ground cover of large woody debris which is interim in nature and will be refined with the prevailing science which should ensure an adequate amount of large down logs (draft HCP, p. IV.10). Large woody debris was considered especially important in the design of riparian buffer widths because of the fundamental role it plays in aquatic ecosystems. Except for Type 4 and 5 streams, the buffers will be 100 feet or a site potential tree

height, whichever is greater. Type 4 streams will receive 100-foot buffers on each side of the stream, and it is expected that at least 50 percent of Type 5 streams will have buffers from the strategy to protect steep and unstable slopes. All the buffers will be measured on the horizontal distance, a provision that has been changed from the draft HCP (Appendix 3, Chapter IV, Section D of this document). The Services and DNR believe that the riparian and wetland buffer widths are adequate to provide sufficient down woody debris in the buffers as a result of the buffer widths, and the restricted activity that will be conducted in the minimal harvest zone, including the minimization of ground disturbance. These measures and the snag and green tree retention measures will ensure that a supply of downed wood is available throughout the landscape.

iii. Terrestrial Carnivores

Summary: A county commissioner believed that the majority of people will not tolerate management of productive lands for predators. One individual said that no action is needed for population gains, and that the cougar population is a problem again.

Response: There are no special conservation measures for cougars in DNR's HCP. In general, DNR's management for large terrestrial carnivores follows Forest Resource Plan policies for the recovery and restoration of endangered and threatened species (FRP DNR 1992b Policy No. 23) and provision of habitat conditions that have the capacity to sustain native wildlife populations (FRP DNR 1992b Policy No. 22). The relative importance placed on predators versus other species is outside the scope of this HCP. Although there has been an increase in the number of cougars in Washington over the past ten years, the current cougar population is not recognized as a problem by WDFW (Steve Pozzanghera, WDFW Carnivore Program Manager, pers. comm.).

(A) wolves

Summary: Bogle & Gates (a consultant to Washington State University) stated that the draft HCP adds further uncertainty and compliance burdens. The same consultant asked whether wolf observations had to be on DNR-managed land, and how many Class 1 observations would affect DNR-managed lands at present. They also asked how many acres of Washington State University trust land would be affected, and what is meant by "economically reasonable" and "limit human disturbance." The National Audubon Society, Northwest Ecosystem Alliance, and WEC said that DNR's draft HCP was inadequate for wolves and that an ITP should not be issued. In particular, all three groups said that state Forest Practices Rules and state wildlife regulations are inadequate. The National Audubon Society and WEC said that the draft HCP does not provide sufficient detail to allow analysis of impacts to wolves. They also asked the Services to scrutinize the intent of the "implement practicable, economically reasonable. . . plans" language. The Northwest Forestry Association wanted; (1) An explicit statement that the conservation

measures for wolves only apply to the HCP planning area; (2) An estimate of the potential impacts of the wolf strategy on DNR management; and, (3) A clear definition of "consultation" with other government agencies that will not abrogate DNR's trust responsibilities. The Northwest Forestry Association believes that the Services and WDFW are not capable of developing "practicable and economically reasonable" conservation measures.

The Washington chapter of the Wildlife Society recommended: (1) conducting surveys for wolves prior to harvest activities; (2) establishing restrictions on ground-based activities within 0.5 mile of dens or rendezvous sites between March 1 and September 30; and, (3) creating a proactive road management program. They also pointed out that the definition used for Class 1 sightings is that for grizzly bears and that it will not work for wolves. A local group recommended that forest management activities and road use be prohibited within 1 mile of known active den sites between March 15 and July 30 and be prohibited within 0.25 mile the rest of the year. Another local group said that wolves cannot tolerate high road densities, and therefore, DNR should not be permitted to road and log areas adjacent to wilderness areas. Fifty-one individuals, who used an identical form letter, wanted to know: (1) If a population viability analysis had been performed; (2) How many roads are on DNR-managed land adjacent to wilderness areas; (3) How many roads are on the rest of DNR-managed lands; (4) How many roads will DNR construct or abandon; and, (5) How will DNR make sure that roads are closed where necessary?

Response: There are currently three Class 1 wolf observations on or near DNR's land within the planning area, but all are 1992 observations and or due to expire in 1997. Therefore, based on current data, sometime in 1997 no WSU trust land would be affected, but some WSU trust land could be affected at anytime in the future. Given the current small number of Class 1 wolf observations within 8 miles of DNR-managed land and the rarity of wolves in Washington, DNR expects the strategy for wolves will not have an unreasonable impact on its management. All DNR-managed lands within the planning area are subject to wolf conservation measures should future Class I wolf observations occur on or within 8 miles of DNR-managed land within the planning area. Explicit language regarding the application of conservation measures for wolves only to the HCP Planning Area is found in the title of Chapter IV, Section D of the draft HCP, in the opening paragraph of the section, and in the first sentence of the second paragraph on p. IV.47.

The words "economically reasonable" have been replaced by the word "practicable." See the response under the heading HCP Commitments for an explantion of the use of "practicable." The word "consultation" has been replaced with the word "cooperation." This change was made to avoid confusion with consultation that occurs under Section 7 of the

Endangered Species Act. As used in the HCP, "cooperation" means that DNR and the Services will work together to develop plans that are agreeable to all agencies. "Limit human disturbance" means applying conservation measures such as operational timing restrictions and/or seasonal open road closures.

Measures within the HCP improve upon state Forest Practices Rules for the gray wolf, which focuses on active den sites. In addition to protecting den sites, mitigation features for the gray wolf in the HCP include: (1) The west side riparian conservation strategy which should increase travel and hiding opportunities; (2) The spotted owl conservation strategy which should promote habitat connectivity in areas adjacent to gray wolf habitat on federal lands; and, (3) Measures for road management which should reduce disturbance in areas of documented gray wolf use (see draft HCP, p. IV.47). For wide-ranging species such as gray wolves, the conservation benefits of this HCP are seen as adjunct to those provided by federal reserves. Protection of rendezvous sites was added through negotiations with the Services (see draft HCP Chapter IV, Section D). After a Class 1 gray wolf observation, site-specific wolf habitat management plans, developed in cooperation with USFWS, will potentially include operational timing restrictions and/or seasonal road closures (see draft, HCP Chapter IV, Section D). DNR will be managing roads proactively. Road closures (Forest Resource Plan, Policy No. 25, 28) and road network management (see draft HCP, Chapter IV, Section D) will minimize human disturbance even without Class 1 observations. DNR does not know how many roads near wilderness areas will be constructed and abandoned under the HCP. Because of the many factors beyond DNR's control that may influence wolf recolonization of the Planning Area, no population viability analyses were conducted for the Planning Area during the permit period. Dates for activity restrictions surrounding wolf dens were developed from information presented in (Mech 1981). The Services expect that the combination of these measures would provide adequate protection of ecological requirements for this species.

DNR will not survey for wolves prior to harvest activities. DNR will rely on records of observations maintained by WDFW. WDFW does classify wolf observations as Class 1, Class 2, and so on.

(B) grizzly bears
Summary: Bogle & Gates (a consultant to Washington State University) stated that the draft HCP adds further uncertainty and compliance burdens. The same consultant asked whether grizzly observations had to be on DNR-managed land, and how many Class 1 observations would affect DNR-managed lands at present. The consultant also asked how many acres of Washington State University trust land would be affected, and what is meant by "economically reasonable" and "limit human disturbance" the National Audubon Society, Northwest Ecosystem

Alliance, and WEC said that DNR's draft HCP was inadequate for grizzly bears and that an ITP should not be issued. In particular, all three groups said that state Forest Practices Rules and state wildlife regulations are inadequate. The National Audubon Society and WEC also said that the draft HCP does not provide sufficient detail to allow analysis of impacts to grizzlies. They also asked the Services to scrutinize the intent of the "implement practicable, economically reasonable. . . plans" language. The Sierra Club believes that there should be special provisions for grizzly bears. The Northwest Forestry Association wanted: (1) An explicit statement that the conservation measures for grizzly bears only apply to the HCP planning area; (2) An estimate of the potential impacts of the grizzly strategy on DNR management; and, (3) A clear definition of "consultation" with other government agencies that will not abrogate DNR's trust responsibilities. The Northwest Forestry Association believes that the Services and WDFW are not capable of developing "practicable and economically reasonable" conservation measures.

The Washington chapter of the Wildlife Society pointed out two errors in the draft HCP's background information on the grizzly bear, and recommended that an approach as described in the grizzly bear recovery plan be implemented, including the use of Bear Management Units. They also asked that sanitation issues relative to proper food storage at campgrounds be addressed. A local group recommended that forest management activities and road use be prohibited within 1 mile of known active den sites between March 15 and July 30 and be prohibited within 0.25 mile the rest of the year. Another local group said that grizzly bears cannot tolerate high road densities, and therefore, DNR should not be permitted to road and log areas adjacent to wilderness areas. Fifty-one individuals, who used an identical form letter, wanted to know: (1) If a population viability analysis had been performed; (2) How many roads are on DNR-managed land adjacent to wilderness areas; (3) How many roads are on the rest of DNR-managed lands; (4) How many roads will DNR construct or abandon; and, (5) How will DNR make sure that roads are closed where necessary?

Response: There are currently no Class I grizzly bear observations on or near DNR-managed land within the planning area. Given the current small number of Class 1 grizzly bear observations within 10 miles of DNR-managed land, the rarity of grizzlies in Washington, and the absence of a program to locate grizzlies, DNR expects that its strategy for grizzly bears will not have an unreasonable impact on its management. It is stated explicitly on p. IV.48 of the draft HCP that the grizzly bear habitat management areas will be created on DNR-managed lands only for Class 1 grizzly bear sightings within 10 miles of DNR-managed lands within the North Cascades Recovery Area.

The words "economically reasonable" have been replaced by the word "practicable." See the response under the heading HCP Commitments for

an explantion of the use of "practicable." The word "consultation" has been replaced with the word "cooperation." This change was made to avoid confusion with consultation that occurs under Section 7 of the Endangered Species Act. As used in the HCP, "cooperation" means that DNR and the Services will work together to develop plans that are agreeable to all agencies. "Limit human disturbance" means applying conservation measures such as operational timing restrictions and/or seasonal road closures.

Measures within the HCP improve upon state Forest Practice Rules for the grizzly bear, which focuses on active den sites. Because grizzly bears often den in upper elevations characterized by deep and lingering snow packs, and such sites are usually not suitable for timber harvest, impacts from the HCP to den sites are expected to be avoided or minimized. A substantial amount of post-emergence habitat occurs in low-elevation areas at the edge of the recovery zone. As of 1993, there were 104 Class 1 and Class 2 sightings in the Washington Cascades (Almack 1993). The locations of the North Cascades grizzly bear observations are widely distributed throughout the ecosystem. Locations and timing of locations indicate at least some of the grizzly bears in the local population are resident to the Washington Cascades, including reproductive females.

DNR believes the conservation strategy for grizzly bears (see draft HCP, p. IV.48) would likely enhance the probability for recolonization of the Planning Area and maintain or further enhance habitat when grizzly bears are inhabitants. The NRF management areas near federal lands will help connect isolated federal reserves and the west-side riparian conservation strategy will provide a network of travel, hunting, and hiding opportunities. DNR will be managing its road proactively. Road closures (Forest Resource Plan, Policy No. 25, and 28) and road network management will minimize human disturbance even without Class 1 observations. DNR does not know how many roads near wilderness areas will be constructed and abandoned under the HCP. The Service believes that high open-road densities and minimal hiding cover could result in mortality and harassment of bears during a tenuous period in a natural-recovery process.

Because proactive provisions to restrict access or reduce road densities incorporated in the strategy are limited to those listed above, the benefits of increased habitat suitability may not be fully realized. High active road densities, where present, could decrease the probability that grizzly bears would occupy DNR-managed lands in those areas. Harvesting and road construction near primary habitats such as avalanche chutes and meadows where no screening is left could negate the value of the habitats. Similarly, unrestricted seasonal activities near primary habitats could also increase disturbance to present but undetected bears.

Although measures in the HCP for grizzly bears are not consistent with the recovery plan, DNR believes that due to the limited acreage of the recovery zone managed by DNR and the specific locations of the parcels, management guidance such as that involving Bear Management Units is impractical. Seasonal road closures, campground sanitation measures, and more specific den site protection strategies will potentially all be a part of the site specific management plans to be developed in response to Class 1 grizzly bear observations. Because of the many factors beyond DNR's control that could influence grizzly bear recolonization of the Planning Area, no population viability analyses were conducted for the Planning Area during the permit period. Errors in the background information for grizzly bears have been corrected.

(C) wolverine

Summary: Point No Point Treaty Council recommended that no activity occur within 0.5 mile of a wolverine den. Another local group said that wolverines cannot tolerate high road densities, and therefore, DNR should not be permitted to road and log areas adjacent to wilderness areas. Fifty-one individuals, who used an identical form letter, wanted to know: (1) If a population viability analysis had been performed; (2) How many roads are on DNR-managed land adjacent to wilderness areas; (3) How many roads are on the rest of DNR-managed lands; (4) How many roads will DNR construct or abandon; and, (5) How will DNR make sure that roads are closed where necessary?

Response: Wolverine dens occur at higher elevations where heavy snow accumulates (Banci 1994), such as at the base of large talus slopes at timberline. Although such areas are not expected to occur on DNR-managed land within the planning area, management activities will be prohibited within 0.5 mile of known active wolverine den sites located in spotted owl NRF management areas (see draft HCP, p. IV.154). These areas are the most likely to be used by wolverines due to their close proximity to wilderness on nearby federal land. Only a small percentage of the area managed by DNR near federal Late Successional Reserves, is not in NRF management areas. DNR believes that road closures (FRP DNR 1992b Policy No. 25) and road network management will help minimize human disturbance and accidental trapping. DNR does not know how many roads near wilderness areas will be constructed and abandoned under the HCP. Because many factors beyond DNR's control would likely influence wolverine recolonization of the Planning Area, population viability analyses were not conducted for the Planning Area.

(D) fisher

Summary: WDFW is concerned about the contraction of the species geographic range. In particular, WDFW is concerned about the loss of low-elevation fisher habitat. Point No Point Treaty Council recommended that no activity occur within 0.5 mile of a fisher den.

Bogle & Gates, a consultant to Washington State University, wanted to know the impact on harvesting of the mitigation measures for fishers.

Response: The Services conclude that fisher den site protection measures (see draft HCP, p. IV.155) combined with the spotted owl, murrelet, riparian, snag, and large, structurally unique tree conservation strategies of this draft HCP will contribute to fisher conservation in Washington by providing landscapes of fisher habitat at lower elevations than the majority of federal lands in Washington. Late-seral stage forest would be available on DNR-managed land and in larger patches on federal lands in the Planning Area. Improved connectivity between noncontiguous blocks of federal land combined with the increased conservation of riparian ecosystems, snags, and large, structurally unique trees should facilitate distribution of fishers in the Planning Area. Because fishers may forage and rest in different habitats, it is expected that the mosaic of habitat types resulting from DNR's activity will benefit fishers. Fishers den and rest in late successional areas, but find prey in a variety of successional stages. Within the OESF, it is expected research on developing forest structure (i.e. diversity of tree sizes and shapes, light gaps, woody debris, standing snags, and layers of overhead cover) within managed forests will also benefit fishers. Such structure is hypothesized to influence fisher habitat use more than stand types (Buskirk and Powell 1994). Although no known fisher dens occur in Washington, DNR will restrict activity within 0.5 mile of known fisher dens within NRF management areas, where such structure will be retained (see draft HCP, Chapter IV, Section A). NRF management areas are the most likely places to contain fishers. The anticipated impact of conservation measures for fishers on DNR's activities as the result of implementation of this HCP are expected to be minimal.

Given the natural rarity of fishers in western Washington, DNR expects that its strategy for fishers will not have an unreasonable impact on its management.

iv. Deer and elk

Summary: The Point No Point Treaty Council is concerned about the effect of high road densities on elk. The Squaxin Island Tribe is concerned about the lack of provisions in the draft HCP for deer and elk. One individual said that the abundance of game in the Northwest testifies to the good and proper management of the past.

Response: Though this HCP is a multi-species plan, the Services recognize that there are certain trade-offs when attempting to manage for a variety of species with differing habitat needs. Habitat management directed toward the spotted owl results in decreased amounts of early successional structural stages that could serve as foraging habitat for elk and deer. However, old-growth and other late successional stands that provide thermal cover and winter forage habitat would be available on nearby federal lands. Late

successional stands that provide thermal cover and early-successional stands that provide forage would be available at all elevations used by deer and elk on DNR-managed lands in each Planning Unit. Road effects on deer and elk are indirectly addressed through road closures (FRP DNR 1992b Policy No. 25), road network management and restrictions on activity in NRF management areas.

b. Birds

i. Sea, shore, & wading birds

(A) marbled murrelets

Summary: WDFW, the NWIFC, Point No Point Treaty Council, Tulalip Tribes, National Audubon Society, Sierra Club, Northwest Forestry Association, WEC, the Mountaineers, Northwest Ecosystem Alliance, three local chapters of the Audubon Society, a local recreation group, 57 individuals (51 copies of an identical letter), and Bogle & Gates (a consultant to Washington State University) made general comments regarding the marbled murrelet strategy described in the draft HCP. The most frequent comment was that, given the uncertainty surrounding the current population status of the murrelet, DNR should not be issued an ITP until more research is completed and a long-term strategy can be formulated. Other comments were as follows: (1) WDFW and USFWS should be designated as cooperators in the formulation of a long-term conservation strategy; (2) DNR should restrict harvest near suitable habitat blocks during the breeding season while the long-term plan is being developed; (3) The conservation objective for marbled murrelets should be to restore populations and habitat; (4) Permanent old-growth reserves should be set aside for murrelet conservation; suitable murrelet habitat must be saved; (5) DNR should grow trees with large branches to serve as nesting platforms; (6) Adopt Alternative C; (7) DNR should provide murrelet habitat well distributed across the murrelet's range; (8) Given the murrelet's strong association with old growth, we can expect the population to decline for 50 years similar to the spotted owl; (9) Due to the interim nature of the murrelet strategy, the HCP as a whole is not a long-term plan; (10) How does the long-term murrelet strategy contribute to certainty in harvest levels over the long term; (11) There is no evidence to support the need for a "no entry" zone around occupied murrelet sites; and, (12) DNR defers harvest in potential habitat instead of participating in a cooperative research program.

One commentor made several points regarding the murrelet ecology section of the draft HCP. These comments are as follows: (1) There are many theories as to why murrelet populations are disjunct along the coasts of Washington, Oregon, and California - other possible reasons in addition to logging should be included in the discussion; (2) Murrelets nest in mid-successional forest - any limitation on the forest types being used by murrelets is premature; (3) There have been no studies to show

the relationship between flight behavior and presence of murrelet nests, thus any reference to "occupancy" as per the Pacific Seabird Group protocol should not be equated to nesting; (4) The number of nests studied to date (59) is too small to be meaningful and a statement should be made that puts this fact into perspective; (5) Generalizations should not be made regarding the habitat characteristics of the entire population; (6) The reference to a correlation between occupancy and nesting should be stricken from the paragraph on p. III.35 of the draft HCP because such a correlation has never been verified; (7) More than three years of data is needed to establish a downward trend in the population; (8) The statement that loss of habitat will have a negative effect on the population is not true in every case as no studies have been done to determine what factors are limiting population growth; (9) It is unwise to draw conclusions from other alcids regarding colonization of new habitat because murrelets are the only member of this family that flies such great distances to find a nest; (10) Natural disturbances have destroyed habitat in the past that is currently occupied by murrelets indicating that they have an ability to colonize new habitat; (11) Packing theory is not applicable to murrelets; and, (12) The effects of forest fragmentation on murrelets is purely speculative.

Response: DNR thinks that the proposed conservation strategy provides an appropriate level of protection for marbled murrelet habitat on DNR-managed lands. The certainty gained through the provisions of Alternative B make it preferable to the No Action alternative. Alternative A provides no commitment to develop a long-term plan, to survey potential habitat for occupied sites, or to continue deferral of potentially suitable habitat. It was determined in the DEIS that Alternative A could lead to the extirpation of murrelets on DNR-managed lands. Under Alternative B, a maximum of 5 percent of the occupied sites on DNR-managed would be taken.

Five percent of potential occupied sites on DNR lands represents a far lower percentage of all potentially occupied sites - a maximum of 0.35 percent of population in Washington (DEIS p. 4-121). Furthermore, the strategy would direct impacts to habitat that supports fewer birds and probably has lower reproductive success (DEIS p. 4-121). Site management plans to be developed under the long-term plan would reduce risk of loss of habitat due to fire, windthrow, and disturbances. Small reduction in population size would be offset by the significant benefits of locating and providing long-term protection to the majority of occupied sites and helping conduct research to determine how to protect the breeding potential of the population. The Services think the proposed strategy for murrelets is an acceptable risk in exchange for the level of protection of high quality habitat and the long-term protection of occupied sites. The level of protection is higher in southwest Washington than was analyzed in the DEIS. The HCP proposal has been changed to protect

surveyed unoccupied habitat in that part of Washington until long-term plans have been completed.

The Service will participate in the formulation of the long-term murrelet strategy through a multi-agency Science Team. The Service will have the ability to bring in technical assistance from third parties.

The HCP has been modified to clarify protection of occupied sites and unoccupied but high quality habitat during the period in which the interim conservation strategy is in effect. Suitable but unoccupied habitat will only be released for harvest if it is farther than 0.5 mile from an occupied site, and the harvest would not take the amount of suitable habitat (as identified in the habitat relationship study) below 50 percent of the total suitable habitat on DNR-managed lands in the WAU. In southwest Washington, no suitable occupied habitat will be released for harvest until the long-term plan for this area has been completed or 12 months has passed since the initiation of negotiations with the Service on the draft long-term plan. These provisions would assist in protecting suitable habitat blocks not only during the breeding season, but during the entire time the interim strategy is in effect.

Analysis of Alternative B in the DEIS resulted in the conclusion that the proposed strategy would implement all six actions listed in the Draft Marbled Murrelet Recovery Plan to achieve recovery of the species (DEIS p. 4-127). These actions are to: (1) secure habitat by designating reserves and critical habitat in both marine and terrestrial habitat and develop habitat conservation plans and protect occupied sites; (2) develop and implement landscape management strategies within marbled murrelet recovery zones to stabilize populations and improve habitat conditions; (3) monitor populations and survey potential breeding habitat to identify nesting areas; (4) implement short-term actions to stabilize the population including maintaining habitat distribution and quality, maintaining suitable habitat in large contiguous blocks, maintaining buffer areas, decreasing adult and juvenile mortality, increasing recruitment, and initiating research to determine the impacts of disturbance in both marine and terrestrial environments; (5) implement long-term actions to stop population decline and increase population growth by increasing the amount, quality, and distribution of suitable nesting habitat, decreasing fragmentation, protecting recruitment habitat, and providing replacement habitat through silvicultural techniques; and, (6) conduct research and monitoring to refine survey and monitoring protocols, examine limiting factors, and gather data necessary to develop specific delisting criteria and appropriate landscape management strategies (Marbled Murrelet Recovery Team 1995). While the potential to restore and enhance the population is lower than in Alternative C, Alternative B still would make significant contributions toward preventing further declines in the population by maintaining habitat in all planning units in which murrelets have the potential to occur on DNR-managed lands (maintaining

distribution), identification and protection of at least 95 percent of potential occupied sites on DNR-managed lands, and protection of suitable, unoccupied habitat in southwest Washington during the interim strategy. Alternative B has a reasonable likelihood to contribute toward enhancement of the population through knowledge gained in the proposed research program and through implementation of the long-term conservation plan as outlined in the HCP.

Any old-growth habitat in which occupied sites are located would be protected under Alternative B. One objective of the research to be conducted under the strategy is to determine how much suitable nesting habitat murrelets require to maintain a stable population at the occupied stand level and the landscape level. The amount of old growth that will be protected will be determined as a function of the ecological requirements of the species.

The proposed interim murrelet strategy has not been designed specifically to develop new nesting habitat. However, over the time frame of the HCP, it is likely that the nest habitat provisions of the spotted owl strategy, the riparian strategy, and the snag recruitment and green tree retention strategy will result in the growth of large trees with potential nesting platforms for marbled murrelets.

While it is true that murrelets appear to be highly associated with old-growth forests, and new habitat will not likely be available in federal reserves for at least another 50 years, it is not straightforward to compare spotted owl demographics with marbled murrelet demographics. Spotted owls use mature and late successional forests for all of their life-needs while murrelets use old forests only for the nesting component of their life history. Thus, marine habitat factors also influence population dynamics of the murrelet. It is not possible to predict at this time how much longer the murrelet population may decline.

While it is true that it is not possible to predict how much murrelet habitat would be protected under the long-term marbled murrelet conservation strategy at this time, it is an over-exaggeration to state that this element renders the entire HCP a short-term plan. First, the conceptual elements of the long-term plan have been identified. Second, potential murrelet habitat as it is currently understood constitutes 4 percent of the entire forested land-base covered by the HCP. Thus, development of the long-term plan will not affect a large proportion of DNR-managed lands, and other elements of the HCP are likely to already provide habitat that will be incorporated into any long-term conservation strategy for the murrelet. The need to defer formulating a long-term conservation plan does introduce an element of uncertainty into future harvest plans. The concept of certainty as it is related to conservation science and predictability of harvest levels however, is relative. HCPs are not intended to alleviate the need for adaptive management of threatened and endangered species.

They do however, allow the Service and the applicant to come to agreement on the parameters that will govern formulation of any new conservation strategies. Further, as was noted directly above, the amount of potential murrelet habitat is small compared to the permit area. For modeling purposes, DNR can assume a range of reasonable scenarios based on the total amount of potential murrelet habitat and make its harvest predictions based on this range.

There is enough evidence to support the contention that disturbance around occupied sites can be a significant factor in negatively affecting adult and juvenile survival. Murrelets appear to be particularly vulnerable to predation (Nelson and Hamer 1995b). Current demographic modeling indicates that increasing nesting success and adult survivorship can have a significant positive effect on the population (Beissinger 1995). Thus, protecting potential breeding sites from disturbances that may lower nesting success is a reasonable strategy to employ while more research is conducted on the specific activities that constitute unacceptable levels of disturbance around occupied sites. No entry zones do not necessarily mean complete exclusion of human presence. Such prohibitions are not indicated in the draft HCP.

The commentor who stated that DNR is deferring harvest in potential murrelet habitat instead of participating in cooperative research is in error. The interim murrelet conservation strategy involves both deferral of harvest in potential breeding habitat and participation in cooperative research. Deferral of harvest is fundamentally necessary in order to avoid take and preserve options for future conservation once habitat definitions have been refined and landscape-level conservation problems are better understood. The brief discussion of the possible relationship between murrelet distribution and the occurrence of adjacent late successional forest acknowledges that the evidence at this point is circumstantial. However, this evidence is considerable, and no other plausible explanations have been discussed extensively in published literature on murrelet ecology.

The summary of current research on murrelet ecology including forest types that have been found to be occupied or in which nesting has been documented in no way precludes the possibility or examination of other forest types for potential murrelet use. The habitat relationship study described in Chapter III of the draft HCP (p. III. 43-46) is designed specifically to examine the full range of habitat types that murrelets potentially use and relate occupancy rates to habitat type. The research described on nesting habitat in the murrelet ecology section simply points out that the preponderance of evidence thus far indicates that murrelet breeding habitat is strongly associated with structures that are present in old forests or in uneven-aged stands with old-growth characteristics.

The paragraph regarding flight behavior and nesting ends with the statement "Occupied behaviors suggest, but do not definitively confirm breeding" (draft HCP p. III.26). This statement is an explicit recognition that the flight behaviors used to define a stand as occupied, which have been exhibited by nesting murrelets, serve as good indicators of nesting, but are not direct proof. The paragraph cites research published in the recent Forest Service publication Ecology and Conservation of the Marbled Murrelet (Ralph et al. 1995) in which certain flight behaviors have been observed in nest stands and/or exhibited by murrelets approaching known nests. Nowhere in the paragraph referred to by the commentor is the claim made that these flight behaviors constitute direct confirmation of nesting, nor do statements in this section extend beyond what has been published as observations of murrelet behavior.

The discussion of data presented regarding nest tree and nest stand attributes clearly presents the sample sizes from which the data is drawn and clearly states that "Generalizations of nest stand, nest tree, and nest attributes should be viewed cautiously in light of the small sample size from which they were drawn...In addition, more extensive surveys of non-old-growth habitat will help determine if, and the extent to which, murrelets use younger and smaller trees." (draft HCP p. III.34). While the sample size does warrant caution about range-wide generalizations, it is not too small to be meaningless. Biological conclusions are often drawn from smaller sample sizes. Further, the data which indicates strong associations of murrelet nesting with older forest has been gathered throughout the non-Alaska portion of the species' range indicating that such associations are not coincidental or meaningless. Surveys for murrelet occupancy in non-old-growth habitat have been conducted and do not have occupancy rates that are as high as for stands with old-growth characteristics - i.e., with trees large enough to contain platforms of sufficient size. The HCP explicitly recognized that further surveys need to be done to gain a more precise understanding of murrelet habitat associations.

DNR and the Service disagree with the commentor who suggests that the statement referencing correlation between nest and occupied behavior be stricken from the paragraph on p. III.35 of the draft HCP. The statement reads "Occupied behavior is indicative of nesting activity in a stand." This statement is accurate and does not claim direct correlation between occupied behaviors and nesting. Using occupied stands as a surrogate for nesting stands is not totally unfounded, but actually provides the best picture of potential characteristics of nesting habitat given the difficulty of locating actual nests. It is true that no studies have looked specifically at the statistical correlation between occupied behavior and nesting. However, as was stated above, the behaviors described as indicating that a stand is occupied have been repeatedly observed by murrelets approaching known nests and by birds flying into and out of stands in which nests occur. The current state of data then warrants deriving

descriptions of occupied stands and stating that these could indicate characteristics of potential nesting habitat, which is what is stated on p. III.35 of the draft HCP. The conservation strategy for the murrelet has been designed to gather more data which will help resolve questions about the relationship between occupancy, nesting, and reproductive success.

The section on murrelet demography and population trend clearly shows that long-term data is lacking and needs to be gathered in order to develop a long-term conservation strategy. The author also clearly stated that the current projected rates of population decline are preliminary and the data used to construct the model could have several sources of bias (draft HCP p. III.36 through 38). Therefore, the commentors concerns are already addressed in the original text.

The commentor is correct in noting that loss of habitat may not in every case lead to population declines. It is noted in the HCP that current demographic models do not allow a distinction to be made between habitat loss and other factors that may lead to population decline. The statement regarding the relationship between habitat loss and negative effects on the population is a general observation from what is known about reproductive rates and maintenance of populations. Given that the forest types currently understood to support murrelet nesting have declined in amount and extent throughout the range of the murrelet, loss of this habitat is likely to already have had a negative effect on the population.

DNR refers the commentor to Divoky and Horton (1995) for a full explanation of the conclusions drawn from comparative studies of alcids as they pertain to natal dispersal and potential implications for loss of habitat on the ability of breeding adults to find new sites. The authors of the study did take into account the different flight habits of marbled murrelets compared to other alcids, noting that murrelets likely had higher rates of natal dispersal than other alcids. Neither Divoky and Horton (1995) nor the author of the murrelet ecology section of the HCP suggest that murrelets cannot colonize new habitat. The hypothesis is that reproductive output of the population may be decreased if in fact marbled murrelets have relatively low natal dispersal capability, and the species had to adapt to new habitat conditions requiring that dispersal distances increase.

Given that murrelets nest away from forest edges, and that nest predation is higher in nests closer to forest edges (Nelson and Hamer 1995b), the discussion of the possible effects of fragmentation on murrelets is not purely speculative, but based on reasonable interpretation of existing data.

Packing is also a reasonable threat about which to hypothesize given what is currently known about murrelet nesting ecology.

habitat-relationship study

Summary: WDFW, NWIFC, Point No Point Treaty Council, Northwest Forestry Association, Society for Conservation Biology, and Bogle & Gates (a consultant to Washington State University) made comments pertaining to the habitat relationship study component of the murrelet alternatives. Comments were: (1) All potential marbled murrelet habitat in southwest Washington (South Coast and portions of the Columbia Planning Units) should be surveyed for murrelet occupancy; (2) There is no scientific basis for allowing the release of habitat that would support 5 percent of potentially occupied sites; (3) The Tribes should be involved in reviewing the data collected in the habitat relationship studies; (4) The HCP and No Action strategies for the marbled murrelet regarding the habitat relationship study are indistinguishable; (5) No data is presented as to how much suitable habitat will be deferred and no estimates are provided as to how much marginal habitat will be released after the habitat relationship study has been completed; (6) We know little about how the time scale and magnitude of change of habitat surrounding occupied sites will affect murrelet breeding and fledging success thus only protecting habitat around occupied sites may prove inadequate; and, (7) It not scientifically credible to defer all timber sales in potential murrelet habitat on almost a complete dearth of data.

Questions regarding the habitat relationship studies included how intensive a survey effort will be conducted during these studies, and will the effort be adequate to find all or even a majority of the occupied sites?

Response: Surveying all potential murrelet habitat in southwest Washington would constitute a lower risk strategy for the species in that portion of its range. The Service, however, thinks that the proposed strategy, including retention of surveyed, unoccupied habitat is a sufficient conservation approach.

The strategy which allows release of marginal habitat that supports 5 percent of the potentially occupied sites is a management proposal that has scientific data suggesting that this release would not cause a large impact to the population (see response in section above, and DEIS p.4-121).

The commentor is correct in noting that the same type of habitat relationship study would be conducted under the No Action Alternative as under Alternative B. The important difference however, is that the No Action Alternative does not specify what will be done with the information gathered in this study, nor is there any commitment to continue deferral of potential habitat or to survey remaining habitat for occupancy.

The Service has the ability to bring in third parties, including the Tribes, for technical assistance in reviewing the results of research conducted as part of the marbled murrelet conservation strategy.

The draft HCP does not contain estimates of the amount of potential habitat that could be deferred during the habitat relationship studies and inventory surveys or the amount that could be released as marginal habitat. These estimates, and the methods for deriving them are described in detail in the DEIS (p. 4-111 through 4-118).

The commentor who noted that we know little about how the time scale and magnitude of change of habitat surrounding occupied sites will affect murrelet breeding and fledging success is correct. The research program associated with the murrelet strategy is designed to study the level of protection required around occupied sites to allow successful reproduction. Questions of the amount of habitat needed at larger scales (e.g., watersheds) will also be examined. The long-term conservation plan is to include occupied site management plans as well as landscape-level measures to reduce gaps in distribution of habitat. The interim strategy should protect adequate amounts of habitat to allow for needed management options once these research questions have been answered.

The Service and DNR disagree that it is not scientifically credible to defer timber sales in potentially suitable habitat. There is not a dearth of data regarding the types of habitat in which murrelets have been observed thus far. There is adequate data upon which to design further research to refine current understandings of murrelet nesting habitat relationships. To not defer timber sales in potential habitat would remove both the ability to learn more what murrelets need and the management flexibility for future conservation options.

The habitat relationship studies are designed to examine a large enough sample of forest stands with a range of habitat characteristics to establish statistically meaningful relationships between habitat types and occupancy. The studies are not intended in and of themselves to accomplish a full inventory survey of habitat on DNR-managed lands. Once habitat relationships have been established, protocol surveys will be conducted to inventory habitat that supports 95 percent of the potentially occupied sites on DNR-managed lands (draft HCP p. III.43-46).

<u>marginal habitat</u>
Summary: The NWIFC, Point No Point Treaty Council, the Tulalip Tribes, Northwest Ecosystem Alliance, Washington Wilderness Coalition, a local chapter of the Audubon Society, and Bogle & Gates

(a consultant to Washington State University) commented on marginal murrelet habitat. Six commentors stated that marginal habitat should not be released for harvest while the long-term strategy is developed. One commentor wrote that too much marginal habitat was being protected.

Response: The deferral of all suitable habitat, both marginal and higher quality would be the conservative approach that could be taken. It would also constitute a "no take" strategy which does not fit the purpose and need of DNR. It was determined in the DEIS that the benefits of Alternative B outweigh the small reduction in population size that would result through the release of marginal habitat and would not reduce the likelihood of recovery of the population. The Service will make a final determination of the adequacy of the proposal in the Section 7 consultation. The Service does think that release of more marginal habitat than is proposed in Alternative B could pose an unacceptable risk to the species.

unoccupied habitat

Summary: WDFW, Washington Wilderness Coalition, and Bogle & Gates (a consultant to Washington State University) made comments pertaining to unoccupied murrelet habitat. One commentor requested that DNR commit to a schedule for carrying out its research proposals in order to ensure that suitable but unoccupied habitat is not completely harvested before the long-term plan is complete and thus future management options can be retained; one commentor requested that suitable but unoccupied habitat be retained as described in Alternative C; and one commentor requested specific information regarding how much timber on Washington State University trust lands would be available for harvest if suitable but unoccupied habitat were made available for harvest within the first two years of the HCP.

Response: Language in the HCP has been modified to reflect a commitment to conduct each sequential step of the conservation strategy with no time gaps. Negotiations with the Service on the long-term conservation plan for each planning unit will begin within 12 months of the completion of inventory surveys. The HCP has also been changed so that all surveyed, unoccupied habitat will be retained in southwest Washington until the long-term plan has been completed, or until 12 months have passed since negotiations have commenced on the plan. Suitable but unoccupied habitat will be released in the other planning units. The request for specific information regarding Washington State University lands is outside the scope of this process.

occupied habitat

Summary: The Society for Conservation Biology and the Northwest Forestry Association made comments relating to occupied marbled murrelet habitat. One commentor wrote that the proposed habitat relationship study was inadequate to be able to estimate site occupancy and that data needed to be colleted regarding reproductive success, predation rates and site abandonment rates if habitat relationships are to truly reflect murrelet habitat preferences. The other commentor wanted clarification and an upper estimate of how much potential occupied murrelet habitat would be off base and for how long under the HCP murrelet strategy.

Response: The proposed habitat relationship study will be adequate to determine site occupancy, as it will use protocol surveys that have a high likelihood of determining if a forest stand is occupied by murrelets. The study will, by itself, be inadequate to answer further questions of how habitat characteristics relate to reproductive success. These questions will be examined as part of larger cooperative research programs on murrelet nesting ecology.

The upper estimate of how much habitat would be off-base to harvest under the proposed HCP is described in the DEIS. There is a total of 60,664 acres of estimated potential murrelet habitat within 50 miles of marine waters that will be deferred during the habitat relationship studies (DEIS p. 4-116). Some portion of this will be released as a result of the habitat relationship studies. Estimates based on current occupancy rates are that 38,442 acres of this habitat will be retained at least until the long-term plan is completed (DEIS p. 4-117).

marine issues

Summary: The Muckleshoot Indian Tribe commented on marine issues related to the marbled murrelet. They requested that the HCP be modified so that new fishing restrictions would not be established without first assessing the possibility of increasing habitat protection (refer to the draft HCP p. III.41 and 43).

Response: The description of threats to marbled murrelets in the marine environment contained in the murrelet ecology section of the draft HCP is intended for background information. DNR's HCP does not cover fishing restrictions as these are outside of the department's jurisdiction regarding trust land management.

ii. Raptors

(A) spotted owls

Summary: WDFW, Muckleshoot Indian Tribe, Tulalip Tribes, The Yakama Indian Nation, City of Port Angeles, Sierra Club, Society for Conservation Biology, The Wildlife Society, The Mountaineers, Washington Forest Protection Association, Northwest Ecosystem

Alliance, Tahoma Audubon Society, 13 individuals, and Bogle & Gates (a consultant to Washington State University) made general comments pertaining to spotted owls. The majority of comments took the general position that the proposed strategy was inadequate for owl conservation on DNR-managed lands. Several organizations and individuals commented that Alternatives B and C would result in the extinction of the owl; two individuals commented that Alternative A would provide the best protection for owls. Other specific comments of this nature included a request that the HCP should use demographic restoration and enhancement as another category of lands; the conservation objective for the spotted owl should be to restore nesting, roosting, and foraging habitat throughout DNR-managed lands; the impact to spotted owl site centers in eastern Washington was out of proportion to the level of mitigation provided; the overall conservation strategy for spotted owls is minimal and there should be more provided from the outset; the plan will wipe out half the owls on DNR-managed lands; a population viability analysis should be done on the HCP proposal; the range of the owl will be reduced under the combination of DNR's HCP and the proposed 4(d) rule; the DEIS should include an analysis of the 4(d) rule. Two commentors felt that the HCP should provide less protection for spotted owls than the current proposal. One of these commentors noted that spotted owls live in second growth; the other felt that past harvest restrictions on the Olympic Peninsula for spotted owls were not based on sound scientific information. One commentor also expressed concern that the DEIS underestimated the amount of spotted owl habitat that would be provided under
Alternative A.

Response: There are several reasons why it is unlikely that Alternatives B or C would result in extinction of the owl. First, the proportion of total habitat on all ownerships in both eastern and western Washington (outside of the OESF) that occurs on DNR managed lands is small compared to the proportion of habitat on federal reserve lands. In western Washington, 55 percent of all habitat occurs on federal reserves, while between 6 and 14 percent of it occurs on DNR-managed lands (DEIS p. 4-64). In eastern Washington, 60 percent of all habitat occurs on federal lands, while only 6 percent occurs on DNR lands (DEIS p. 4-212 and 213). Under the President's Northwest Forest Plan, habitat conditions are expected to improve on federal reserves over time. Thus, the likelihood that either Alternatives B or C, which both make nonfederal contributions of habitat in areas identified by the Northern Spotted Owl Recovery Team and other owl conservation planning efforts to be important to the population, would result by themselves in the extinction of the species. Second, in the long term, Alternatives B and C would provide demographic support to spotted owls at a higher level than Alternative A. Given that both Alternatives B and C provide habitat in support of medium to large clusters of owls on or near federal reserve lands and that the USFWS determined in its biological opinion for the President's Northwest Forest

Plan that the owl had a high chance of persistence over the next 100 years, it is unlikely that either of these Alternatives would cause extinction of the species. In addition, the USFWS will not issue an ITP to DNR if it determines in its Section 7 consultation that the proposed HCP would impair the long-term survival of the spotted owl.

The Service and DNR disagree that Alternative A is better for spotted owls than either Alternatives B or C. The DEIS demonstrates that over a 100 year period, Alternative A contributes the least to spotted owl conservation. Because of near-term take of spotted owls under both Alternatives B and C, Alternative A provides a higher level of protection for the next 10 to 20 years. However, because of the incentive to keep habitat levels at a minimum (40 percent within existing owl circles) and the disincentive to allow forests to develop into habitat under Alternative A, conditions for the owl would very likely deteriorate over time.

If DNR were to adopt a conservation objective to restore spotted owl habitat on all the trust lands it manages, the agency would probably be acting in violation of its trust duties. In addition, such a standard is beyond what is required for issuance of an ITP under Section 10 of the Endangered Species Act.

The Services and DNR disagree with the commentor who said that the impact to spotted owl site centers in eastern Washington was out of proportion to the level of mitigation provided. The DEIS stated that there are approximately 67,500 acres of suitable spotted owl habitat on DNR-managed land in eastern Washington. The DNR has estimated that over the short term, approximately 44,400 acres of this owl habitat would be located in owl circles and unavailable for harvest. This habitat would be sparsely distributed, fragmented, and would decrease in quantity over the long term. The proposed HCP provides 19,600 of NRF habitat and 42,500 acres of dispersal habitat in close proximity to federal reserves. The strategic placement of DNR-managed habitat with respect to federal reserves and the long-term certainty for the existence of this habitat is thought to be adequate mitigation for the short-term adverse impacts to owl site centers. Furthermore, more mitigation would not have satisfied a main purpose of the proposed action, namely, "produce the most substantial support possible" for the trusts.

In designing the conservation strategies for the HCP, DNR has to satisfy two main legal obligations. The first is compliance with issuance criteria under Section 10 of the ESA, the other is to produce long-term income for the trust beneficiaries. The spotted owl strategy was developed to provide support to the federal population as a way to not appreciably reduce the likelihood of survival and recovery of the species, while allowing DNR to fulfill its trust obligations. The draft HCP represents what DNR considered to be the most reasonable balance of its conservation and trust duties. Through Section 7 consultation, the Services will determine

whether the proposal meets the biological criteria established under Section 10 of the Endangered Species Act.

To say that the proposed HCP will "wipe out" half the owls on DNR-managed lands is an overstatement of impacts. The HCP would, if adopted, have negative impacts on between 123 and 151 known and projected site centers whose regulatory circle overlaps DNR-managed lands. These sites would be at risk for incidental take and they represent between 40 and 49 percent of known and projected sites that influence DNR-managed lands. However, "take" based on the 40 percent guideline is a regulatory concept. When the amount of habitat in a circle that approximates a median annual home range falls below 40 percent, mortality does not necessarily ensue. Impairment of reproductive success may result, as may displacement. At some point, if the nest site is harvested, or enough habitat is removed to make survival impossible, mortality may occur. Another element to consider is that for most of the site centers that influence DNR-managed lands, DNR is not the major contributor of habitat. For between 73 and 80 percent of sites, habitat on DNR-managed lands constitutes less than 10 percent of the area of a median home range size circle to each site. In eastern Washington, habitat on DNR-managed lands amounts to less than 2.5 percent of the area of a median home range radius circle at 45 percent of the sites. In western Washington, 47 percent of sites that influence DNR-managed lands fall in the same category. Outside of NRF management areas proposed in the HCP, there are only three sites on the west side in which DNR-managed lands contribute more than 20 percent of the circle in habitat. In contrast, NRF areas on the west side include 14 sites in which DNR lands contribute more than 20 percent of the circle in habitat. DNR's management activities do not exert the main influence on most of the circles that overlap its lands outside of proposed NRF management areas.

Quantitative population viability analyses require models and data on how owl populations respond to factors that affect their ability to persist into the future. Such factors include changes in demographic attributes of the population, degree of genetic variation within and among individuals in the population, variation in behavioral attributes of individuals within the population, systematic and catastrophic losses of habitat, changes in distributional patterns of habitat (e.g., fragmentation), interspecific interactions such as competition and predation, and the effects of disease pathogens and environmental contaminants (USDA 1992; USDA and USDI 1994). Existing data for these factors is either insufficient or non-existent in most parts of the owl's range, making a meaningful population viability analysis impossible to conduct at this time. Risk analysis of all proposed and accepted management plans (e.g., the President's Northwest Forest Plan) for spotted owls continues to rely on professional judgement based on an incomplete understanding of even such factors as

demographic trends for which five to eight years of quantitative data exits. DNR's proposed HCP is no different.

The Services and DNR agree that the combination of DNR's HCP and the 4(d) rule will contribute to the contraction of the current and historical range of the spotted owl.

The 4(d) special rule-making process has not yet been completed. Thus, the possible action of implementing a 4(d) rule is still too speculative to allow analysis as a complete alternative. The cumulative effects of DNR's HCP and the proposed special 4(d) rule are described in the DEIS (p.4-93 and 94 and p. 4-235 and 236).

The fact that spotted owls have been located in second growth forest does not provide any justification for DNR to provide a lower level of protection for spotted owls than what is provided in the draft HCP. The strategy is actually based primarily on the hypothesis that spotted owls can use managed forests to meet at least part of their life needs. This hypothesis is based on observations of owls in landscapes that contain structural remnants of old growth in otherwise disturbed stands - either from natural or human management processes. DNR's proposal contains a large research and monitoring component to verify this hypothesis. There are many questions that remain unanswered about the extent to which spotted owl populations can survive and reproduce in managed landscapes and the amount and distribution of structural components that adequately provide nesting, roosting, and foraging functions. The DNR strategy would not have been proposed in its current form without the existence of large blocks of unmanaged old-growth forest that will be in reserve status on federal lands.

The rationale behind the conservation strategy for spotted owls in the OESF planning unit is explained on pages IV.74-75 and IV.88-90 of the draft HCP. It was developed in consideration of available information on owl and forest ecology as well as current and predicted future land-management trends in the context of the long-term vision for the OESF that was derived from the 1989 report of Commission on Old-growth Alternatives for Washington's Forest Trust Lands (see pages I.14-15 of the draft HCP).

The Services and DNR disagree that the amount of spotted owl habitat that would be provided in Alternative A was underestimated in the DEIS. The estimate is based on how DNR would continue to implement it Forest Resource Plan policy without an HCP. In addition, the data used to approximate the total amounts of potential spotted owl habitat results in many cases in an overestimation of the amount of habitat on DNR-managed lands (see DEIS p. 4-16 - 4-18). Furthermore, many forest

stands that contain the structural attributes of habitat may be too small and or too isolated to function as spotted owl habitat on a landscape level.

population impacts & models

Summary: NCASI, The Northwest Forestry Association, the City of Port Angeles, the Port of Port Angeles, three individuals, and Bogle & Gates (a consultant to Washington State University) commented on spotted owl population issues and population models used in the DEIS. Four commentors stated that the Olympic Peninsula population has exceeded recovery goals set in the Recovery Plan, or that recent population studies have demonstrated that the population is not in decline. Some of these commentors further stated that DNR should take this "new" information into account in its conservation planning and decrease the level of protection for owls in the OESF. One commentor wrote that the DEIS inaccurately described the impacts of the unzoned forest alternative compared to No Action to the owl population in the OESF. Two commentors provided detailed technical comments regarding the population models used for both the non-OESF and the OESF portions of the HCP in the DEIS. One of these commentors felt that DNR deliberately manipulated spotted owl demographic data in the estimates of future take used in the DEIS to present an overly optimistic picture of the current status of the population in Washington State. This commentor presented alternative models using the rates of population decline that ranged from 1 percent per year to 12 percent per year. He concluded that higher rates of decline were more realistic and that if the population was declining at a rate of 4.5 percent as opposed to 1 percent as presented in the DEIS that the HCP would contribute to the extinction of the owl. The second commentor's remarks were specific to the model used for the OESF. This commentor wrote that demographic rates used in the model from Burnham et al. (1994) were too pessimistic and that more recent data from Forsman et al. (unpublished) should be used or some justification given for using the older data. Another point of concern was the lack of statistical justification for the habitat quality index. The commentor felt that the speculative nature of this index should be emphasized in the text. This person also recommended the use of data which shows that precipitation has more of a statistically significant effect on owl reproductive success than amount of habitat within an owl territory.

Response: DNR did not manipulate data used in its projections of future take to present an overly optimistic picture of the current status of the population. DNR used existing data, with all assumptions about its use of that data clearly stated, to present a worst case scenario for DNR's impacts on spotted owls in NRF Management Areas. DNR used the upper limit of the 95 percent confidence estimated for λ, the population's rate of change, in its projections for

future take (DEIS, p. 4-64 and 4-213). The commentor wrote that using this value rather than the mean was unconscionable. DNR contends that the methods and data selected for any population estimate depend on the objectives of the estimate. The projections the commentor refers to in the DEIS were intended to show a worst case scenario of future take. Models using a higher value for λ, i.e., the upper limit of its 95 percent confidence interval, would project more owls in NRF Management Areas, and therefore, a higher likelihood for incidental take in the future. Models using a lower value for λ, i.e., the mean, would project fewer owls in NRF Management Areas and DNR's proposed HCP would be projected to have much less potential for incidental take over the long term. As stated in the DEIS (p. 4-64 and 4-204), the FSEIS for the Northwest Forest Plan (USDA and USDI 1994a, p. 3&4-233) explained that high values for λ are more consistent with observations of owl densities over the period of time to which the demographic data applies. According to USDA and USDI (1994a), a 4.5 percent per year decline (λ=0.955) is highly unlikely. Furthermore, the DEIS did not use λ to draw any inferences about spotted owl populations outside of the OESF planning unit.

The Draft Recovery Plan described region-specific "biological goals" for habitat protection, and projected the numbers of owls that might be supported after habitat recovery. Those goals were for habitat protection and recovery, not for owl numbers and do not alter the context in which the HCP proposal was developed (see draft HCP, p. II.5 through 10). The conservation strategy for the OESF was developed in light of current estimates of owl population numbers and trends on the Olympic Peninsula (see draft HCP p. III.15 through 18 and DEIS p. 4-308 to 311), thus the draft HCP proposes a conservation strategy in which there is a reduction in the amounts of habitat in the near-term.

The population model was only one of several means used to evaluate alternatives for the OESF, and was intended to provide qualitative, objective comparisons among those alternatives, not numerically accurate predictions of the outcomes of those alternatives. Thus, demographic rates used in the modeling effort were chosen to be reasonably consistent with then-published analyses (i.e., Burnham et al. 1994, Holthausen et al. 1994). With the exception of juvenile survivorship, all of the demographic parameters were taken from (or tuned to) Burnham et al. (1994) and Forsman et al. (1984), with some guidance from Holthausen et al. (1994). We used a set of juvenile survival rates (0.38, 0.41, 0.44, 0.47, 0.50, 0.51 in the DEIS, Appendix D, Table 5) which respresented a range of plausible values, considering adjustments for juvenile emigration. These values were greater than the Burnham et al (1994) estimates, but less than the larger estimates presented in Holthausen et al. (1994). Coincidentally,

the model runs discussed in the DEIS (Chapter 4, p. 4-321 to 324, 4-329 to 331, and 4-336 to 348) were performed with adult survival rates approximately equal to those reported by Forsman et al. (in press).

The commentor makes a legitimate point about the statistical validity of the habitat quality index used to define a gradient of quality across the spectrum of young- to old-forest habitat (DEIS, Appendix D, p. 8 and 9). As the commentor suggests, readers should understand that the index is based on empirical observations, is consistent with knowledge of habitat relationships of owls in the western hemlock forest zone, and is intuitively reasonable, but it is also speculative and has not been validated by rigorous statistical analyses.

It is evident that spotted owl populations respond to other environmental features than forest structure (e.g., Irwin 1993, Seaman 1995). This was noted in developing the habitat parameters for the population model in that an elevation/climatic model (Henderson et al. 1989) was used to classify some old forests as non-habitat (DEIS, Appendix D, p. 8). Modeling that more accurately reflects reality is always desirable, however the population model was developed and model runs were completed before Knight and Seaman (1995) made their preliminary presentation on the relationship between weather and spotted owl fecundity. While those results appear to have substantial explanatory power, they have not been fully peer-reviewed. And even if they prove to have substantial explanatory power, the model results used in the DEIS are sufficient to provide objective, qualitative comparisons among HCP alternatives because weather patterns are relatively homogenous across the OESF area of the Olympic Peninsula.

<u>nesting, roosting, & foraging (NRF) habitat</u>

Summary: The Yakama Indian Nation, the NWIFC, Society for Conservation Biology, a timber company, seven individuals, and Bogle & Gates (a consultant to Washington State University) submitted general comments pertaining to spotted owl nesting, roosting, and foraging habitat. The majority of the commentors requested stronger protection measures for spotted owl habitat than is provided in the HCP. One commentor wrote that less protection could be provided. One commentor noted that the landscape assessment process that will be used to determine habitat conditions within NRF management areas is not described in detail in the HCP nor is the time line for completion of these assessments. This commentor requested that this information be disclosed in the final HCP.

Other specific comments were: (1) The owl population cannot wait 100 years for habitat to recover in NRF areas; that it is presumptuous to assume that owls will use habitat set aside for them if they are not already there; (2) That no more than 20 percent of the required habitat in NRF areas should be in a sub-mature condition - the remainder should be higher quality habitat (3 commentors); (3) None of the alternatives provides maintenance of species distribution in southwest Washington or the rest of the western Washington Lowlands province therefore an ITP should not be issued because the HCP will not allow for long-term survival of the owl; (4) There is no evidence to support a strategy that allows habitat to move over time within NRF areas thus requiring owls to reestablish their territories; (5) The amount of replacement spotted owl habitat should eventually exceed what is harvested under the HCP; (6) Based on the forest habitat type comparison in Chapter 2 of the DEIS, it appears that the No Action alternative will provide more habitat for spotted owls than the HCP proposal, yet the DEIS portrays the HCP as a better alternative for owls; (7) Management should not be allowed in Type A habitat, there should be no salvage logging in NRF areas, prohibition of harvest of habitat during the breeding season within NRF areas would reduce impact to owls; (8) There should be no harvest of historical sites because of metapopulation dynamics; (9) Habitat restoration should not be used as mitigation; (10) How will riparian management zones in OESF areas serve as NRF habitat; how much of RMZs will serve as functional spotted owl habitat; and, (11) a proper analysis of projected management of Forest Service matrix lands in the White Salmon area would reveal that less protection is required for the issuance of an ITP.

Regarding the OESF, one commentor was concerned that the HCP document discussed ecosystem management but stated that spotted owls do not direct that management. The commentor disagrees with that approach and thinks that ecosystem management has little meaning unless ecosystem-level wildlife concerns are addressed and met. This commentor was especially concerned with the degradation of old-growth forest habitat.

Response: The proposed HCP will most likely result in improved habitat conditions within NRF management areas in the five west-side planning units over time as a result of the nest patch approach, the riparian management strategy, and the marbled murrelet strategy. Field data indicates that most of the spotted owl habitat on DNR managed lands in these planning units is Type C habitat. There are currently a total of approximately 35,000 acres of forest lands older than 200 years in the five west-side planning units (DEIS p. 4-19, Table 4.2.3) with 23,700 acres of forest older than 150 years within proposed NRF management areas. There will be a projected 51,000

acres of forests older than 150 years old within NRF management areas by the end of the permit period, with much of that likely in a geographic location and patch size to be useful to spotted owls because of the 50 percent habitat requirement within WAUs and the configuration of nest patches. If the research phase results in a different strategy for providing nesting structure in the landscape, then it is likely that forest stands whose primary cohort is younger than 150 years old would serve as habitat that supports nesting spotted owls. In addition, the overall amount of suitable spotted owl habitat will be greater in Alternative B (the proposed HCP) than the No Action alternative in the five west-side planning units (DEIS, p. 4-45). In the three east side planning units, the overall amount of NRF habitat that will be developed and maintained on DNR-managed lands would be less under the proposed HCP than under the No Action alternative. The strategy in the HCP, however, is to maximize DNR's contribution to the owl population as supported by federal reserves. There are 19 WAUs in which the amount of habitat will increase from current levels in order to reach a 50 percent level in designated NRF areas. The strategy in eastern Washington is consistent with both the proposed 4(d) rule and the recently adopted state permanent Spotted Owl Rule.

The Services do believe that less protection for NRF habitat would be unacceptable for issuance of an ITP.

The landscape assessment process is not described in detail in the HCP. The HCP document does not in general contain the details for implementation of the plan. The HCP does specify that a landscape assessment process will take place in each WAU in which harvest activity is planned and that the goal of such assessments is to ensure that the amount and quality of spotted owl habitat has been accurately determined in the field and that spotted owl ecology has been taken into account when planning where to place timber sale units. The amount of time required for an assessment will depend on the size of designated NRF areas in the particular WAU in which harvest is intended, but should not take more than one field season to complete.

DNR designated NRF areas (under Alternative B) are at present in a variety of spotted owl habitat conditions. According to existing habitat data, there are 54 WAUs in which NRF areas are below the habitat target. However, of the total 101,000 acres that will be maintained in NRF habitat under the proposed HCP, there is presently a total deficit of 14,100 acres - approximately 3,200 acres in 19 WAUs in the three east side planning units and 10,900 acres in 35 WAUs in the five west-side planning units. Given that the deficit of habitat is spread among a relatively large number of WAUs, there are no large areas that are without habitat. Those areas that are currently

not in a habitat condition were designated because of the importance of their geographic location for long-term owl conservation. The Service thinks that the proposed strategy of allowing harvest of habitat outside of designated NRF areas in exchange for the maintenance of existing habitat and development of new habitat within designated NRF areas will not place the owl population at a greater risk of extinction than under the No Action alternative.

There is ample evidence to demonstrate that spotted owls disperse to unoccupied habitat. This is the basic mechanism of population dynamics in a territorial population. In addition, owls occur in landscapes that have been subject to disturbance, i.e. forests which have not always been habitat. Thus, it is not presumptuous, but a well-grounded ecological concept that if a forest develops structural attributes required by spotted owls, and if this forest occurs within dispersal distances of reproductive owl pairs, then it is likely it will be used by spotted owls.

The Service and DNR think that the proportion of sub-mature habitat and high quality nesting habitat for NRF areas in the five west-side planning units is adequate. Approximately 20,400 acres of high quality nesting habitat will be arranged as 300 contiguous acres surrounded by an additional 200 contiguous acres of habitat that is sub-mature quality or better. These nest patches will total 12.5 percent of the designated NRF areas in high quality nest habitat and will be embedded in a larger landscape of habitat that is sub-mature quality or better. In conjunction with the other components of the HCP, namely the riparian, snag and green tree retention, and marbled murrelet strategies, the remaining 38.5 percent of the habitat will eventually be mix of habitat that is both sub-mature and higher quality. Forest growth and harvest modeling done for Alternative B projects that 51,000 acres of forest will be older than 150 years by the end of the 100 plan period (DEIS p. 4-39), which amounts to 31 percent of the NRF areas and approximately 62 percent of the spotted owl habitat to be maintained in NRF areas in the five west-side planning units. This amount is higher than the 30 percent suggested by the commentor, and represents more forest older than 150 years than the 23,700 acres that currently exists in NRF areas designated under Alternative B.

For response to issues surrounding southwest Washington, see category heading NRF Distribution in this section.

The amount of replacement habitat within NRF areas will not replace all the habitat that could eventually be harvested outside of NRF areas under Alternative B. Mitigation for habitat harvested outside NRF

areas is to maintain and develop habitat in areas thought to most efficiently support the spotted owl population. The overall HCP in the five west-side planning units will provide more forests that could potentially serve as spotted owl habitat outside of NRF areas than occurs at present (DEIS p. 4-39). These forests (forests older than 70 years old) however, would not be managed specifically for spotted owls, thus the DEIS did not count these forests as making a definite habitat contribution.

DNR and the Services disagree with the commentor who stated that Chapter 2 of the DEIS portrays Alternative A as providing more spotted owl habitat than Alternative B. The long term consequences of implementing current spotted owl management policy are consistently portrayed in Section 2 and Section 4 of the DEIS as leading to loss and degradation of habitat over time. Matrix 2a (p.2-63) does state that the No Action Alternative could potentially result in 16 percent of DNR lands outside the OESF in fully functional forest as compared to 12 percent under Alternative B. There are major differences between these alternatives for spotted owls, however. First, as is described in the analysis of impacts of the alternatives to spotted owls, continued implementation of spotted owl circle management will lead to smaller habitat patches and a loss of habitat over time as circles move or become decertified. This aspect of Alternative A was not modeled, thus the results described in Matrix 2a and in Chapter 4 of the DEIS (p. 4-472) overestimate the amount of fully functional forest that will be retained as a result of regulatory protection of spotted owl circles under Alternative A. For spotted owls, the habitat that would be provided under Alternative B would be in geographic locations and spatial configurations useful to owls on a landscape level, and maintenance of projected levels guaranteed. Second, there is great uncertainty involved in projecting present day forest management policies for 100 years under the No Action Alternative. While an HCP does not completely eliminate uncertainty, it does allow projection under the terms of the legal contract that would bind both DNR and the Services to a known level of species and habitat protection for the duration of the agreement. Thus, it is quite speculative to say that DNR-managed lands will be covered by 16 percent fully functional forest in 100 years under Alternative A.

The idea to allow management of Type A spotted owl habitat within NRF areas was originally put forth as one of two options by the HCP Science Team (DNR 1995e). This option has a recognized higher risk level than the option that would preclude management within Type A habitat. In exchange for allowing such management to occur, DNR committed to establishing nest patches in the five west-side planning units to retain exisiting nest structure in the landscape and to doing

research on spotted owl nesting ecology in managed landscapes. This provision was thought by the Science Team to not pose large risks to owls in eastern Washington due to the presence of nesting owls in sub-mature habitat types. The Service accepts this approach.

The inclusion of a salvage logging provision in the spotted owl strategy is driven by state law (RCW 79.01.795 and RCW 76.06.040). The Service will be included in discussions of any salvage activities that may be required under these statutes. If they determine that such activities would have an adverse affect on the conservation strategies, DNR and the Service will work together to find sufficient mitigation to allow the activities to proceed (see draft HCP p. IV.11 and p. IV.21).

In order to reduce potential impacts to nesting spotted owls within NRF areas, the Services or its designee will conduct surveys within WAUs in which the amount of suitable habitat has exceeded the target levels in order to update information on spotted owl site locations. These surveys will be conducted in such WAUs every three to five years. DNR will use this information to plan harvest activities farther than 0.7 mile from the site center during the breeding season. The text of the HCP has been changed to reflect this commitment.

The HCP spotted owl conservation strategy recognizes the importance of metapopulation dynamics. The NRF area approach represents a shift from regulatory owl circle by owl circle management, which results in habitat fragmentation and decreasing levels of habitat over time, to landscape level management. In this approach, a constant level of habitat will be maintained and current or historical site occupancy does not drive timber harvest decisions (except to avoid harvesting nest sites). Under Alternative A (No Action), however, decertification surveys are part of the strategy to reduce the amount of forest land that is not available for harvest due to the 40 percent habitat threshold within owl circles. Three successive years of no occupancy can result in a circle attaining a "historical status" and thus releasing that habitat for harvest. This possibility is precisely why the No Action Alternative can result in long term loss of spotted owl habitat on DNR trust lands and is precisely why DNR is proposing to move to landscape-level management of spotted owl habitat. Dispersing juvenile owls are easily capable of movements that traverse the distances necessary to accomplish this (see DEIS p. 4-310). Current thought is that the Olympic Peninsula subpopulation is large enough that it is likely to be self-sustaining (see Holthausen et al. 1994, or the brief review in DEIS p. 4-313 and 314). Historic owl sites (most of which are unoccupied because, currently, habitat conditions are inadequate to support owls, DEIS p. 4-326 through

327) are likely to play little or no role in the near- or long-term support of that subpopulation without habitat restoration. The OESF conservation strategy for the spotted owl intends to support the geographic and ecological distribution of the Olympic Peninsula subpopulation by maintaining or restoring landscape conditions that support owl pairs over a significant portion of their potential range (see DEIS p. 4-330 to 331, 4-334 to 335, 4-341, and 4-347).

DNR and the Service disagree that habitat restoration should not be used as mitigation for incidental take. Commitment to habitat restoration is the primary tool by which the Service can secure agreements from proponents to develop and maintain habitat in areas that are important to the spotted owl population but currently are in a poor habitat condition. Habitat restoration in the context of the HCP strategy for the OESF means developing forest stands and landscapes that support successfully reproducing spotted owls that are a functional segment of the Olympic Peninsula subpopulation (draft HCP p. IV.75). Spotted owls are known to successfully re-colonize forests that regenerated either after natural disturbances or logging (see Horton 1996 for a review of spotted owl ecology in the context of managed forests). It is widely thought that spotted owl populations can respond favorably to habitat restoration (e.g., USDI 1992, USDA and USDI 1994a, b). The *status quo* in the OESF area is currently not adequate to support successfully reproducing spotted owls that are a functional segment of the Olympic Peninsula subpopulation (DEIS p. 4-333, 4-338 to 339; and the draft HCP p. IV.77 and IV.78), thus habitat restoration is necessary to meet the mission of the OESF (see draft HCP p. IV.69 through 75). This habitat restoration meets the definition of mitigation (see draft HCP, Glossary, p. 9).

Of all DNR-managed lands that provide habitat for spotted owls, DNR's proposed level of incidental take of spotted owls is highest in the White Salmon area. The strategy for this area was to establish NRF management areas within 1.8 miles of federal reserves and in key areas directly south of the Yakama Indian Reservation. There are several spotted owl site centers on or within 1.8 miles of DNR-managed lands for which DNR would no longer provide support precisely because of the location of federal matrix lands and or the lack of federal lands at all. DNR and the Service do not think it is acceptable to provide less protection in this area than is already proposed.

It is hypothesized that streamside forests provide particularly important habitat for spotted owls (Carey et al. 1992, Carey and Johnson 1995). Streamside and unstable hillslope areas in the OESF that will be managed under the proposals of the riparian conservation strategy will have the potential to function as nesting, roosting, and

foraging habitat for spotted owls when the following conditions are met: 1) the structure and composition of forest stands in those areas are similar to those described as old-forest habitat by Hanson et al. (1993), and 2) either the sizes of older streamside or hillslope stands are sufficiently large that interior forest (greater than 50 m from an abrupt edge) comprises an appreciable proportion of those stands or those older streamside or hillslope stands are embedded in upland stands that are similar to those described as young- or old-forest habitat by Hanson et al. (1993). Streamside and hillslope stands with structure and composition similar to those described as young-forest habitat by Hanson et al. (1993), and also meet criterion 2 above will have the potential to function as foraging and roosting habitat for owls.

Currently, only 28 percent of streamside forest stands and an unknown proportion of stands on unstable hillslopes are older than 50 years (draft HCP p. IV.121-122). An unknown proportion of those also meet criterion 2 above and currently have the potential to function as young- or old-forest owl habitat. If the HCP proposal is implemented in the OESF, it is hypothesized that most streamside and unstable hillslope areas (approximately 1/3 of the land base in the OESF) would attain stand-level characteristics of owl habitat because of management to maintain and restore riparian functions (draft HCP p. IV.121). However, not all such stands will have the potential to function as owl habitat because some will be too small or narrow to function alone, and will be periodically embedded in young forests that are not potential habitat.

The distribution of potential habitat in streamside and unstable hillslope areas will vary across landscape planning units with some steep, unstable drainages such as many in the Willy-Huel and Clearwater landscapes (see draft HCP p. IV.78 through 85) having much more of their area managed for riparian conservation (draft HCP p. IV.121) and thus, more potential habitat regardless of the characteristics of the surrounding uplands. Three independent, preliminary efforts modeling forest growth and harvest in the OESF projected that young- and old-forest habit will comprise approximately one-half of the uplands (draft HCP p. IV.79 through 85, DEIS p. 4-340, and DEIS, Appendix D p.2). If both streamside and unstable areas, and habitat in the uplands were distributed evenly across the OESF then half of the areas managed for riparian conservation would be embedded in habitat in the uplands and eventually have the potential to function as owl habitat. However, because of the large streamside and unstable hillslope areas in several landscapes, it may be that as much as two-thirds of the total area managed for riparian conservation in the OESF may ultimately have the potential to function as owl habitat.

The draft HCP (p. IV.74 and 75) states that the forest ecosystem values of stand-level function for dispersal, foraging, roosting, and nesting habitat for spotted owls, and landscape-level functions that include supporting successfully reproducing owls that are a functional segment of the Olympic Peninsula subpopulation are explicit objectives of the OESF conservation strategy. The portion of the comment regarding degradation of old-forest habitat will be addressed in the response to the following series of comments.

NRF-designated areas

Summary: WDFW, the Point No Point Treaty Council, Northwest Forestry Association, Society for Conservation Biology, and two individuals commented on NRF designated areas. WDFW had several suggestions for corrections in the maps of NRF areas presented in the DEIS as well as for additions to proposed NRF areas. Other comments include a recommendation to not remove NRF areas if federal reserves become sufficient to support spotted owls on their own at some point in the future because other late successional species depend on owl habitat; areas excluded due to elevation should be evaluated on a case-by-case basis to determine whether or not the area is capable of supporting the growth of spotted owl habitat; the average range of a female spotted owl is 15 miles so NRF areas should extend 15 miles from federal reserves instead of 2 miles; small parcels of DNR lands that are designated as NRF areas are not likely to make a significant contribution to demographic support and thus should no longer be designated in exchange for a higher habitat requirement in an adjacent WAU that contains larger parcels; NAPs and NRCAs should not count toward the 50 percent habitat goal because they are not legally part of the HCP and the legislature could change the way these lands are managed so they no longer contribute NRF habitat; and the Siouxon area should be excluded from NRF designation because adjacent federal lands will adequately support owls in this area.

Response: DNR and the Service reviewed comments and questions from WDFW regarding potential errors or omissions in NRF area designations. The resulting changes are shown in the map section of this FEIS. In the North Puget Planning Unit, no changes were made to actual designations. However, the map has been clarified to show which NRCAs and NAPs are also designated NRF areas and which ones, though not designated NRF areas, will be providing nesting, roosting, and foraging habitat by virtue of their current habitat condition and location. The Greider Ridge NRCA in the Spada Lake basin is one such

non-NRF designated NRCA that will provide suitable habitat. This NRCA was not designated as an NRF management area because it currently has no overlapping owl circles and it is further than 2 miles from a federal reserve. Portions of the Morning Star NRCA which are adjacent to a federal reserve were not designated as a NRF area because of high elevation, non-habitat conditions.

In the South Puget Planning Unit, a small parcel directly north of the Mineral Block was shown as having no spotted owl role. This was a mapping error and has been corrected to show that it is a designated NRF area. There are two sections near the end of Highway 706 that are designated for a dispersal function. WDFW asked is these were intended for a NRF function because of the proximity to federal reserves. These parcels occur in an area recommended by the Spotted Owl Recovery Team to serve a dispersal function and will thus retain that designation.

In the Columbia Planning Unit, WDFW pointed out a section south of Mount St. Helens that is adjacent to a federal reserve. The HCP Science Team did not designate this parcel for a NRF function because it currently has no habitat and is not within an owl circle, thus they did not think it was an efficient use of DNR land for spotted owl conservation. The "no role" designation will be retained.

In the Yakima Planning Unit, the dispersal areas directly to the south of federal reserves and north of the Yakama Indian Reservation (south of Highway 12) were not designated for a demographic support function because ecological conditions (a combination of elevation and soil type) of these lands do not support spotted owl habitat. The dispersal designation is retained.

In the Klickitat Planning Unit, six sections directly adjacent to Forest Service matrix land in the White Salmon area (T05N R10E, sections 34, 33, 28, 27, 22, and 21) have been changed from dispersal management to NRF management to provide more support for existing site centers. These sections were redesignated in exchange for changing six sections in T07N R12E of NRF management area to dispersal management. The parcels changed to dispersal management areas are peripheral to nearby site centers. This change results in three fewer site centers being at risk for incidental take than was originally assessed in the DEIS for Alternative B. It was also thought that DNR-managed lands would be more efficiently used by supporting four of the site centers in the cluster that spans both

federal and nonfederal lands within the boundaries of the SOSEA under the new state spotted owl rule. Habitat contributions from private land owners in the area are also possible because of the provisions of the new rule.

The draft HCP includes language that allows the Board of Natural Resources the option to approach the Service with a proposed amendment to remove NRF designations if sufficient data exists at some point in the future to indicate that federal reserves are sufficient to support the spotted owl population. Any such proposal would be considered by a multi-agency Science Team that will be convened to make recommendations on any biological amendments to the HCP. Multi-species issues would be taken into account in any decision.

An elevational screen has commonly been used when considering potential spotted owl habitat (Stearns 1991). DNR believes the use of such a screen is appropriate for its HCP.

There is no data to support the contention of the commentor who stated that the average home range radius of a female spotted owl is 15 miles. A home range with this radius would encompass 452,390 acres which is an order of magnitude larger than the largest home range sizes reported in Hanson et al. (1993). This data is based on the use of the minimum convex polygon method. Other methods of home range estimation such as the 60 percent adaptive kernel technique often produce smaller home range sizes. Hanson et al. (1993) determined that the radius of a median annual home range for spotted owl pairs is 2.7 miles in the Western Washington Lowlands and Olympic Peninsula Provinces, 2.0 miles in the Western Washington Cascades Province and 1.8 miles in the Eastern Washington Cascades Province. The Service will evaluate any new data that suggests that basing owl conservation strategies on these radii would result in jeopardizing the species and take appropriate action under the extraordinary and unforseen circumstances clauses of the implementation agreement.

The proposal to de-designate small parcels of NRF areas in exchange for higher levels of habitat in adjacent WAUs is an interesting idea. However, in some planning units, the Yakima and Chelan in particular, there are very few options for designating NRF areas other than the small parcels that exist. In other areas where this option may exist, DNR and the Service think that it will be more beneficial at this time to have more forested area in a 50 percent habitat condition as opposed to fewer areas in a 60 percent habitat condition. This is because

data is lacking on the distinction in habitat quality between a 50 and 60 percent level, so the trade-off may not be that beneficial to owls. In addition, in areas where small parcels occur in SOSEAs designated under the newly adopted State Spotted Owl Rule, the opportunity exists for adjacent private landowners to manage spotted owl habitat using a landscape approach rather than a spotted owl circle approach. Thus, DNR's habitat contribution could be complimented by other nonfederal lands increasing the value of the contribution.

The location and habitat condition of a small number of NRCAs and NAPs make them valuable to the HCP spotted owl conservation strategy. The Service does recognize that management plans for these areas could change by legislative action. Thus, the HCP requires that sufficient mitigation be found for the loss of habitat contribution should these particular NRCAs and NAPs be de-designated or their management change such that older forest that currently exists there be degraded or harvested as a result of legislative action.

DNR-managed lands along with other nonfederal lands in the Siouxon area will remain important to the spotted owl population in Washington regardless of the habitat condition on federal reserve lands. This is due to the fact that they lie farther to the west than federal lands, thus contributing to the maintenance of species distribution and serving as a potential demographic link between Oregon and Washington populations, and to the fact that they contain low elevation habitat which is uncommon on federal lands (USDI 1992b). The Washington Forest Practices Board Spotted Owl Science Advisory Group (SAG), also considers habitat in the Siouxon as essential to the spotted owl population in Washington (Hanson et al. 1993).

quality/definition

Summary: WDFW, The NWIFC, the Point No Point Treaty Council, National Audubon Society, Sierra Club, NCASI, Washington Wilderness Coalition, WEC, Northwest Ecosystem Alliance, two local chapters of the Audubon Society, and 55 individuals (an identical letter sent by 51 different individuals) made comments relating to spotted owl nesting, roosting, and foraging habitat definitions. Most comments generally conveyed the opinion that higher quality habitat than that defined as sub-mature in the HCP should be provided in NRF areas. Six commentors wanted the down woody debris component in sub-mature habitat increased from 5 percent ground cover to 15 to 20 percent ground cover. One commentor felt that it was inappropriate to include sub-mature habitat as NRF unless it

contained significant structural legacies of snags, large trees, and down woody debris. This commentor also requested that DNR establish minimum standards for numbers of large trees, snags and down woody debris to qualify sub-mature habitat as NRF. Another commentor felt that the provisions for snags and down woody debris in sub-mature habitat were in general below a safe level. One commentor wrote that the GIS habitat analysis in the EIS which included some 60 year old forest as owl habitat constituted a statistical "sleight of hand" and that 70 percent canopy closure was inadequate. Fifty-one commentors (same form letter from 51 separate individuals) wrote there were not enough snags, large trees and down wood in the nesting habitat definition.

Regarding the OESF, one commentor wrote that the strategy of allowing some high quality old forest to be degraded in exchange for commitment of habitat that was of uncertain value was too risky for owls in that planning unit. This commentor felt that experimentation in old growth was reasonable, but should proceed more cautiously and allow DNR the flexibility to conclude that more old growth was required than what is currently being proposed for the OESF.

Other comments and questions included how, in the absence of surveys, will DNR determine if sub-mature habitat is actually being used by spotted owls in the manner in which the HCP strategy intends; there should be Tribal input on the development of new habitat definitions after the research phase; replacement habitat should develop naturally; the HCP should acknowledge that scientists have a relatively crude understanding of what constitutes suitable spotted owl habitat; and, that because little is understood about survival strategies of spotted owls in eastern Washington habitat types, there should not be more manipulation allowed than in western Washington.

Response: In the five west-side planning units, the combined overall provisions of the HCP will result in NRF management areas that have a mix of sub-mature and higher quality spotted owl habitat. The overall quality of habitat in NRF areas will be higher at the end of the permit period than when the HCP would go into effect. Approximately 20,400 acres of high quality nesting habitat will be arranged as 300 contiguous acres surrounded by an additional 200 contiguous acres of habitat that is sub-mature quality or better. These nest patches will total 12.5 percent of the designated NRF areas in high quality nest habitat and will be embedded in a larger landscape of habitat that is sub-mature quality or better. In conjunction with the other

components of the HCP, namely the riparian (including protection of unstable slopes), leave tree, and marbled murrelet strategies, the remaining 38.5 percent of the habitat will eventually be a mix of habitat that is at minimum sub-mature quality, but will likely have more large trees and snags. Forest growth and harvest modeling done for Alternative B projects that 51,000 acres of forest within NRF areas will be older than 150 years by the end of the 100 year plan period (DEIS p. 4-39), which amounts to 31 percent of the NRF areas and approximately 62 percent of the spotted owl habitat to be maintained in NRF areas in the five west-side planning units. This amount represents more forest older than 150 years than the 23,700 acres that currently exists in NRF areas designated under Alternative B.

A clarification of the definition of NRF habitat used in the HCP for the five west-side planning units has been inserted into the text of the document that is analyzed as part of this FEIS. The definition reads " For the purposes of this HCP, NRF habitat refers to habitat that is primarily roosting/foraging habitat with sufficient amounts of nesting structure interspersed such that the entire area can be successfully utilized by reproducing owls". Spotted owls nest in sub-mature habitat in eastern Washington. The strategy for provision of NRF habitat during the research phase is to retain two 500 acre nest patches (300 acre patches of the highest quality nesting habitat available plus 200 acre sub-mature buffers) per the most contiguous 5,000 acres of designated NRF areas possible. Additional nesting structure will most likely be retained in occupied marbled murrelet habitat, steep and unstable slopes and riparian areas, as was explained above. This approach essentially recognizes that not every acre of NRF habitat used by spotted owls would be capable of allowing the establishment of a nest site. Outside of the nest patches, the landscape will be at least sub-mature habitat which the SAG determined to provide all the characteristics that owls need for roosting and foraging (Hanson et al. 1993). This habitat type corresponds to the high end Type C habitat from the former DNR habitat classification system. The goal of the research phase is to determine what constitutes adequate amounts and distribution of nesting structure for spotted owls in managed landscapes in western Washington. The results of this research will be implemented if this HCP is approved.

DNR chose a minimum of 5 percent down-woody debris for inclusion in its definition of sub-mature habitat for the following reasons. First, it is minimum and can be increased if research shows that more is required. Second, Carey and Johnson's

(1995) study demonstrated that on the Olympic Peninsula, populations of small mammal communities reach higher levels in unmanaged stands with abundant down woody debris versus managed stands with lower amounts of down woody debris. The study did not examine optimum population levels of small mammals vis a vis spotted owl foraging use of those areas. While spotted owls do prey on ground-dwelling small mammals, flying squirrles are their primary prey species. Snags are the structural feature that best predict the presence of flying squirrels (Carey 1995). In addition, their work is from the Olympic Peninsula, which is not representative of forested areas in the western Washington Cascades. Third, as Carey and Johnson (1995) pointed out, managed stands do not contain high percentages of down woody debris cover. From an initial analysis of DNR's forest inventory data, down woody debris is apparently a limiting factor for spotted owl habitat on DNR-managed lands at the present time. Management of NRF areas under the HCP will move forest stands toward higher levels of down woody debris with 5 percent as a minimum target level. In the meantime, it will conduct research and use any new data generated by other researchers on what constitutes adequate amounts of down woody debris for spotted owl prey populations in managed landscapes. Carey and Johnson's (1995) data is not definitive on this topic. Fourth, inclusion of a down wood component goes beyond the original definition of sub-mature habitat (Hanson et al. 1993). Their definition assumed that the snag component would eventually contribute to a down wood component. Thus DNR's approach will require down wood in addition to what may eventually accumulate from the retention of snags and leave trees.

DNR and the Services disagree that the nest habitat definition has too few large trees and snags. The high quality nest habitat definition is derived from the only two studies of vegetation characteristics around spotted owl nest sites in Washington state that are currently available (draft HCP p.IV.12 to 16). The number of snags and large trees is higher than any currently used definition of NRF habitat in the state and is characteristic of unmanaged old-growth forests. An initial examination of DNR forest inventory data indicates that a very small percentage of DNR-managed forest lands contain all the characteristics described in the high quality nesting habitat definition.

The methodology used for assembling the multiple data source spotted owl habitat map is explained in the DEIS (p. 4 through 16). The fact that field typed habitat data most closely matched 60 year old stands in some planning units reflects one or a

combination of factors. The field typed data was primarily low quality Type C habitat thus giving a low standard of comparison. Second, those stands could have contained enough residual structure to qualify as Type C or better habitat. Third, the original inventory data that classified age class of the primary species in the stand could be in error. As was discussed in the DEIS, the quality of existing habitat data is less than optimal, which is why the Interdisciplinary Team decided to use two methods of estimating the amount of habitat. It is acknowledged in the DEIS that the amount of habitat estimated by the multiple data source method probably represents an overestimate (p. 4-14 to 18).

The HCP Science Team and the Spotted Owl Science Advisory Group (Hanson et al. 1993) think that 70 percent canopy closure is an adequate minimum standard, based on the literature. Many mature stands will exceed this level of canopy closure.

The HCP monitoring program will include examining the ability of sub-mature habitat to support spotted owl prey populations, and expanding current understanding of the role of various habitat components in providing roosting and foraging functions. The validation monitoring that will occur primarily in the OESF will study spotted owl use of various habitat types including sub-mature habitat. Additional research on spotted owl habitat will be conducted in eastern Washington as appropriate.

The HCP strategy is cautious regarding manipulation of sub-mature habitat in eastern Washington (see draft HCP p.IV.19 and 20). Given that spotted owls nest in landscapes that have been disturbed by fire and past timber harvest, the Services think that this approach is acceptable.

DNR and the Services disagree that habitat restoration should proceed without management intervention. In many instances, thinning and other silvicultural techniques will accelerate the development of habitat structures (USDI 1992b; USDA and USDI 1994b; Carey and Johnson 1995). The precise techniques to be used and a better understanding of the structure, composition and function of spotted owl habitat in managed landscapes are the subject of much of the research and monitoring that are proposed as part of the HCP.

If signed, the HCP is a contract between DNR and the Services. The Services have the ability to designate other parties to assist in overseeing the implementation of the agreement, including

seeking tribal input into the development of nesting habitat definitions upon completion of the research phase.

The conservation strategy for the OESF proposes to achieve three objectives that are functional responses to forest stand and landscape conditions, i.e., responses of individual spotted owls as well as of the Olympic Peninsula subpopulation at-large (draft HCP p. IV.74 and 75). The working hypotheses that is the basis for the management approach proposed in the draft HCP (p. IV.75 through 88) sets a threshold level for old-forest habitat, as defined by Hanson et al. (1993), of at least 20 percent of each landscape planning unit. Their definition was adopted from that of Thomas et al. (1990) who described structure, composition, and function of this habitat-type. Functionally, it is the cover type that the majority of radio-tagged owls showed significant selection for. They also described structure and composition of the habitat-type. The HCP does not propose to replace functional old-forest habitat with habitat of "uncertain value" as part of the 20 percent per landscape planning unit threshold. With our current knowledge, only forest stands with structure and composition consistent with definitions of old-forest habitat could be used to "replace" current old-forest habitat, and then only if landscape-level abundance was above the threshold level. Spotted owls respond to forest structure, composition, and function - not to degrees of naturalness. Structurally diverse forests with abundant large live trees, snags, and logs are likely to have the potential to be good owl habitat whether they regenerated after natural disturbances or logging.

amounts

Summary: The Yakama Indian Nation, National Audubon Society, Sierra Club, Society for Conservation Biology, the Mountaineers; a local chapter of the Audubon Society, 53 individuals (51 copies of the same form letter) and Bogle & Gates (a consultant to Washington State University) submitted comments regarding amounts of habitat within NRF management areas. These comments were as follows: the target for NRF areas should be 75 percent instead of 50 percent; the target should be 80 percent instead of 50 percent; the target should be 60 percent not 50 percent; why increase the habitat amount to 50 percent when 40 percent has been proven adequate; more nesting habitat should be provided; there should be 60 percent habitat within 0.7 mile of a nest; the HCP would provide too much marginal habitat; there is not enough nesting habitat; NRF habitat should be comprised of no more than 20 percent sub-mature quality habitat and the remaining 80 percent should be higher quality such as Type A and Type B habitat; and

federal estimates of habitat on federal lands vary over time, this inconsistency could have a negative financial impact on DNR-managed lands, thus the strategy should be reconsidered.

Response: The rationale for providing 50 percent suitable spotted owl habitat in NRF management areas on a WAU scale is described in DNR's draft HCP (p.IV.25 and 26). While 60 percent habitat might provide a higher level of demographic support than 50 percent, the absence of a statistically significant difference in owl density or reproductive success between 50 and 60 percent habitat coverage (Bart and Forsman 1992) led DNR to propose the lower level as a compromise position between meeting the biological requirements of the Endangered Species Act and the requirement to produce the most substantial support to the trusts possible. Providing 40 percent habitat at a landscape level has not been proven sufficient, and could lead to less than adequate amounts of habitat at a territory scale (Bart 1995). The Service thinks that the proposed strategy is acceptable to meet Section 10 criteria.

Retaining 60 percent habitat within 0.7 mile of nest sites may constitute a lower risk conservation strategy for spotted owls than that in the proposed alternative. Data originally analyzed in the Interagency Scientific Committee's Conservation Strategy for the Northern Spotted Owl (Thomas et al. 1990) and reanalyzed by Bart (1995) indicates that owls are more likely to occupy sites with greater than *h* acres of habitat within 0.7 mile of the site center than with less than *h* acres with *h* ranging from 200 to 800 acres. While this data indicates that habitat near the nest site is important, it does not indicate how much suitable habitat owls need around their nests. Data analyzed in the FEIS for the Washington State Forest Practices Board Spotted Owl Rule indicates that the majority of sites with reproductive output that would support a stable or increasing population have more than 500 acres of (approximately 50 percent) habitat within a 0.7 mile core versus less than 500 acres (WFPB 1996a p.2-112). However, a large number of sites with low reproductive output also had more than 500 acres within a 0.7 mile core (WFPB 1996a pp.2-101, 2-103, 2-107, 2-109). Again, data on the correlation of amount of suitable habitat around nest cores and reproductive output indicates that habitat amount is important near the nest, but no threshold is evident. The HCP Science Team thought that maintaining an overall landscape condition of 50 percent habitat and establishing nest cores with 500 acres suitable habitat (300 acres nesting habitat, 200 acres of sub-mature habitat or better) was adequate protection. Further, the draft HCP has been modified such that DNR is committing to

harvest habitat away from known site centers in WAUs that have habitat above the target level. This provision will result in the retention of all existing habitat within a 0.7 mile core of known sites within NRF areas. In addition, the draft HCP has been modified to incorporate a take schedule of sites outside of NRF areas to allow important sites to be retained for the first decade of the HCP. Sites with high reproductive output will be prioritized for take avoidance.

DNR-managed lands in NRF areas are currently dominated by forests that are sub-mature habitat or lesser quality, with smaller amounts of older forest (DEIS Figure 4.2.5 and 4.2.8, p. 4-35 and 4-37). The proposed HCP will result in an overall improvement of habitat conditions within NRF areas (see response under *Nesting, roosting, foraging habitat - quality, definitions* above).

Federal habitat estimates vary as better information becomes available. DNR does not think that the use of the best available habitat data constitutes a financial impact to DNR or a reason to reconsider the proposed strategy. Linking the target amount of habitat in DNR NRF areas to adjacent federal reserves is a sound landscape strategy that allows DNR to complement the President's Northwest Forest Plan and provides relief from incidental take prohibitions in other areas.

distribution

Summary: WDFW, Muckleshoot Indian Tribe, Yakama Indian Nation, NWIFC, NCASI, Society for Conservation Biology, Sierra Club, the Mountaineers, Northwest Ecosystem Alliance, 53 individuals (51 copies of the same form letter), and Bogle & Gates (a consultant to Washington State University) commented on the distribution of NRF habitat and NRF areas.

Comments are as follows: The DEIS notes that declining habitat is a severe threat in the southern portion of Western Washington Cascades Province yet little NRF habitat will be protected on DNR-managed lands - this appears to be a discrepancy and needs to be clarified; establish 4 mile radius experimental areas around all known sites in southwest Washington to maintain distribution of owls in Washington state and allow some economic return; lack of provisions for spotted owls in southwest Washington is contrary to recommendations in the Recovery Plan, thus DNR should add NRF areas here; DNR should analyze an alternative that supports clusters that are further than a median home range radius from federal reserves; add NRF areas to southwest Washington and the rest of the Western Washington Lowlands

Province for HCP; protection of NRF habitat in southwest Washington is needed for linkage to Oregon Coast Range; in the east side planning units, extend NRF areas to within at least 5 miles of federal reserves and Yakama Indian Reservation; DNR could reduce the edge-to-area ratio in a portion of the Columbia Planning Unit by including lands north of Interstate 2 and west of Mount St. Helens in a NRF area and in the North Puget Planning Unit by changing the dispersal designations north of Route 20 to NRF areas; provide NRF area(s) in the Sultan Basin to provide a solid, low elevation connection between federal lands to the north and south; why are there no NRF areas in the Straits Planning Unit; NRF areas would be better used if they added demographic support to small clusters instead of ones that already consist of 20-25 pairs; and the WAU approach which requires that DNR lands contribute at least 50 percent habitat on its lands regardless of the condition of federal reserves unfairly burdens DNR. One commentor wanted to know how the 5,000 acre blocks in which nest habitat patches are to be located are going to be determined.

Response: DNR and the Services disagree with the commentor who stated that little habitat is protected on DNR-managed lands in the southern portion of the Western Washington Cascades Province. The Northern Spotted Owl Recovery Team (USDI 1992b) divided the Western Washington Cascades Province into northern and southern sections roughly at Mount Rainier. DNR has designated large blocks of its managed lands in the Siouxon and Columbia Gorge areas as NRF management areas, following the recommendations of the Recovery Team. In fact, the proportion of existing habitat protected on DNR-managed lands is the highest of any other province. Approximately 73 percent of the habitat on DNR lands within 6 miles of federal reserves in the Columbia Planning Unit are within NRF areas. The next highest proportion of habitat on DNR-managed lands that falls within NRF areas is 67 percent in the Chelan Planning Unit.

The situation with regard to owls in Southwest Washington is complicated, and is directly related to the physical and biological features of that area. This area is relatively accessible with a climate and soils well-suited to growing trees. It has been intensively harvested beginning early in Washington's history. Many portions of this area have already been harvested three or more times. Old-growth forest is conspicuously absent, and the landscape is dominated by younger plantations (e.g., <45 years old). Yet, in spite of the low densities of what we normally consider to be suitable owl habitat, a number of owls (including two breeding pairs) have persisted. This may be related to the

inherent productivity of this area. Southwest Washington (south of Highway 8 and west of Interstate 5) contains only negligible amounts of Ederal lands.

The proposed 4(d) special rule also plays an important role in development of this HCP. Because HCPs are developed through a negotiated process, it is difficult for the Service to extract mitigation in excess of what a land-manager would be required to provide without a permit. The proposed 4(d) rule does not contain any Special Emphasis Area (SEA) in Southwest Washington. An option available to DNR is to not pursue an ITP covering owls in Southwest Washington and merely wait for the 4(d) rule to be completed. The 4(d) special rule, as proposed, would not require land-managers to provide demographic support outside SEAs.

The Service must assess DNR's proposal in several ways; two of the considerations are discussed below. One consideration will be to determine if the lack of demographic support in Southwest Washington, as proposed in DNR's HCP, will significantly reduce the likelihood of survival and recovery of that species in the wild. In conducting that analysis, the Service will not consider the 4(d) special rule proposal. The Section 7 consultation process uses a "first in line, first in right" approach. In other words, because the 4(d) special rule proposal is also a federal action, it will also be evaluated according to Section 7 at the time of that action. Should DNR's HCP be completed prior to the promulgation of the proposed rule, DNR's HCP would be evaluated with the assumption that other lands would continue to be subject to Section 9 prohibitions on take.

Currently there are about 20 owl sites in the Province; 13 of these are in Southwest Washington and the remaining sites are adjacent to the Western Washington Cascades province immediately to the east of this area. All 20 of these sites are at risk of take from the proposed rule. The southern most sites in the Olympic Peninsula Province would also be at risk. Promulgation of the 4(d) rule as proposed, and in the absence of landowner incentives, would place all owl sites between the Mineral Block and the Peninsula at risk and all sites between the Cascades Range and the Coast in Southwest Washington at risk. Of the 13 sites in Southwest Washington, DNR lands contain the site centers and/or significant amounts of habitat for at least half of the sites, including both of the two breeding pairs that occur in Southwest Washington.

Second, another consideration is whether DNR's HCP would minimize and mitigate the effects of the take to the maximum extent practicable. This must be viewed in the overall context of the amount of owls to be taken and the impacts that would result. A relatively small number of sites (13) exist in Southwest Washington. The DNR HCP would likely result in the take of over half of those sites, including both breeding pairs. This would have a major impact on the owl population in the Province. A larger number of owl sites will be taken throughout the remainder of the State but these will represent a smaller percentage of the sites in the other Provinces. The impacts of take to occur Statewide will be assessed relative to the mitigation proposed in DNR's HCP, which includes nesting habitat, foraging and roosting habitat, and dispersal habitats in key locations across the State. The amount of mitigation in Southwest Washington, however, is minor and merely incidental with respect to owls. One factor the Service will consider is the effects at the Province level and how those impacts are addressed by the mitigation which occurs elsewhere in the State.

The Service notes that recommendations of the final draft Recovery Plan will not be met by DNR's proposed HCP. However, there is no requirement for HCPs to be consistent with Recovery Plans. The relationship between Southwest Washington and the Oregon Coast Range was referenced by one commenter. The Service notes that the relationship is unclear at this time with regards to mutual demographic support and exchange between those two areas.

The Service will further analyze the above-addressed factors, as well as other factors, as it considers its responsibilities under Section 7 of the ESA and as it assesses whether the issuance criteria for a Section 10 permit are being met.

The DEIS analyzed two options that do provide protection to spotted owls farther than a median home range radius from federal reserves. Alternative B provides protection for owls in the Siouxon, Columbia Gorge, and White Salmon areas that extend up to 8 miles from federal reserves. Alternative C provides more protection in the White Salmon and farther to the east in the Klickitat Planning Unit. Under Alternative C, 77 percent of the territorial site centers that influence DNR lands would have some portion of their median home range radius circle covered by NRF management areas. Options that provide more protection do not fit the purpose and need of the proposed action and thus were not developed further.

The commentor who recommended that NRF Management Areas be extended to 5 or more miles from federal reserves in the eastern Cascades supported their recommendation with the fact that 80 percent of spotted owls on DNR-managed lands occur on DNR-managed lands within 10 miles of federal reserves. Table 4.3.2 (DEIS, p. 4-186) shows the spatial distribution of spotted owls within a median home range radius of DNR-managed land with respect to federal reserves. Actually, close to 90 percent of spotted owls on DNR-managed lands occur on DNR-managed lands within 10 miles of federal reserves. But, nearly 60 percent of site centers lie within 2 miles of federal reserves. Table 4.3.2 shows that beyond two miles from federal reserves, a law of diminishing returns exists for the conservation of spotted owl site centers. NRF Management Areas designated for DNR-managed lands within 2 miles of federal reserves benefit 60 percent of site centers within a median home range radius of DNR-managed land. Extending NRF Management Areas another two miles from federal reserves would benefit only another 10 percent of site centers within a median home range radius of DNR-managed land. A strategy based on NRF Management Areas extending 4 miles from federal reserves would be a less efficient strategy for the conservation of spotted owls.

One commentor suggested that designation of DNR lands north of Highway 2, west of Mount St. Helens, and north of Highway 20 as NRF habitat would reduce the edge-to-area ratio created by large indentations in the boundaries of federal reserves. DNR-managed lands north of Highway 2 are designated as NRF areas. DNR-managed lands to the west of Mount St. Helens are currently non-habitat and do support spotted owls, thus would not constitute an efficient or useful designation, nor assist in reducing the edge-to area ratio habitat patches in the area for quite some time into the future. All DNR-managed lands north of Highway 20 that are adjacent to federal reserves and thus have the potential to reduce edge-to-area ratio are already designated as NRF areas. Lands that are designated for a dispersal function are too distant from reserves to assist in reducing landscape-level fragmentation.

In response to the commentor who suggested that DNR establish NRF areas in the Sultan Basin to provide north-south linkage in the western Cascades, the proposed strategy does establish NRF management areas in this location. The entire basin is not designated, but most existing habitat and all presently known site centers that are on or overlap the area are included in NRF areas. In addition, the Greider Ridge Natural Resource Conservation

Area, which is not designated as an NRF area but will continue to make a *de facto* habitat contribution as long as it is managed as an NRCA, also occurs in this area. DNR and the Service think that this combination of NRF areas and NRCAs constitutes adequate protection for spotted owls and owl habitat in the Sultan Basin.

By virtue of the location of DNR-managed lands throughout the range of the spotted owl in Washington State, the criteria use to establish designated NRF areas has resulted in areas that support both large clusters and small to medium clusters. Support of small to medium clusters will assist in demographic support of metapopulations that could be prone to extirpation due to lower number of reproducing individuals. Due to current habitat conditions on federal reserves, nonfederal habitat contributions to medium to large clusters is thought to assist the demographic stabilization of clusters that occur in areas with less than optimal habitat conditions (see DEIS p. 4-82 and Lamberson et al. 1994).

DNR and the Service disagree that the WAU approach which commits DNR to maintaining NRF areas at 50 percent habitat level even if adjacent federal reserves exceed 50 percent habitat unfairly burdens DNR lands. This strategy constitutes mitigation for harvest of habitat over a substantial portion of DNR-managed lands with a net gain in acres over which DNR can manage its lands for trust income.

The 5,000 acre groupings of NRF areas for the purposes establishing nest habitat patches will be done by DNR staff biologists during the first year of implementation of the HCP. The process will use GIS and professional judgement to find the most contiguous groupings of NRF areas possible and the optimum distribution of nest patches across the landscape given current habitat conditions and location of known nest sites. DNR will seek professional consultation from the WDFW in this process.

management within

Summary: WDFW, the NWIFC, Northwest Forestry Association, Society for Conservation Biology, two individuals, and Bogle & Gates (a consultant for Washington State University) commented on issues pertaining to management practices within NRF areas. Specific comments are as follows: (1) WDFW suggests that language should be inserted in both the west side and east side sections regarding management of sub-mature habitat which requires DNR to avoid manipulation of habitat near known spotted owl activity centers within

demographic support areas until those sites move; (2) WDFW is interested in discussing participation in a cooperative or some other inexpensive program in which the location of spotted owl activity centers is monitored in each WAU with excess habitat every three to five years; (3) The HCP should discuss the possibility of using nest boxes to enhance the northern flying squirrel population; (4) There should be no logging in areas established for spotted owls; there should be no harvest of any Type A spotted owl habitat nor any salvage logging within NRF areas; (5) The discussions of management activities allowed within NRF areas highlights the need to document the silvicultural, operational, and economic effects of such practices and guidelines; (6) Given that the definition of NRF habitat in the glossary included structural legacies of trees that are more than 200 years old, it appears that the concept of allowing NRF habitat to "move" around NRF management areas over the course of the HCP misrepresents what can actually occur because the plan only goes for 100 years; and, (7) In eastern Washington, the standards for allowing management within NRF habitat create a high price to pay for minor mistakes (e.g., if the tree density standard is not met).

A few commentors posed the following questions regarding management standards within NRF areas: (1) Of the factors listed that may be considered in a landscape assessment process, when habitat in excess of the target amount is to be harvested, which ones will DNR actually commit to considering? (2) What quantity of sub-mature characteristics must be present in determining if an additional five percent of sub-mature habitat can be manipulated? (3) What is the basis for determining that two years is an adequate amount of time to detect whether or not sub-mature characteristics have been attained or retained after manipulations? (4) Is the sub-mature habitat that is not designated as nesting habitat subject to a total aggregate 10 percent harvest limitation during the research phase or are successive five percent harvests allowed as long as the most recently harvested five percent meets the sub-mature definition? (5) Is it silviculturally appropriate to allow partial cutting in old growth? (6) What are DNR's assumptions about partial harvesting of old growth (i.e., how much will take place and under what conditions) and can this actually take place? (7) Will roads be prohibited to access partial harvest units if they require the removal of habitat for construction? (8) What happens if a natural event causes a stand that has been treated as part of the five percent limit to not meet the sub-mature habitat definition -- will any further harvest in the WAU be prohibited until that stand has recovered? (9) How will the two year, five percent

limitation on harvest within sub-mature habitat affect timber sale contract extensions? (10) Is the two year, five percent limit on partial harvest of sub-mature habitat too restrictive in eastern Washington, given that this will only allow a stand to be entered approximately every 40 years and that spotted owls appear to do fine in stands that have been partially harvested? (11) Is the landscape assessment process used to determine habitat amounts and a plan for harvest of habitat in WAUs that exceeded the specified target subject to NEPA and/or approval by the federal government?

Response: The HCP has been modified to incorporate the suggestion that harvest be avoided around known nest sites in demographic support areas until those sites move. If the HCP is adopted, DNR will avoid harvest of habitat within 0.7 mile of known nest sites in WAUs in which the amount of habitat exceeds the target level. In addition, the Service (or its designee) has committed to conducting spotted owl surveys in WAUs in which habitat is, or will soon be, available for harvest in order to update locations of site centers. These surveys will be conducted every three to five years, and DNR will use this updated survey information in planning harvest activities within NRF areas.

DNR and the Service think that habitat management for conditions that support flying squirrels is a more biologically sound approach to spotted owl conservation than using nest boxes as a surrogate for snags. In addition, many other wildlife species will benefit from the continued existence of snags in the landscape.

The Service does not think that it is necessary to establish reserves in which logging is prohibited in order to successfully provide habitat for spotted owls. Such requirements would also make applying for an ITP and preparing an HCP an action that would not fit DNR's purpose and need.

The management of Type A habitat and provisions for salvage logging are addressed previously under the comment category *Nesting, roosting, foraging habitat.*

The operational, silvicultural, and economic effects of the spotted owl management guidelines will be documented as either part of the monitoring and research component of the HCP or, for those economic aspects not required to be reported as part of the monitoring plan, as part of the regular business operations of DNR.

The definition of NRF habitat contained in the glossary of the HCP is a generalized definition and was not intended to convey stand-level requirements under the spotted owl conservation strategy. The definitions, along with guidelines for amounts, distribution, and management activities permitted that are described in Chapter IV, Section A of the draft HCP, are those by which to assess what will occur on the ground. Thus, it is not misleading to portray the spotted owl strategy as one in which the location habitat will move over time as habitat targets are exceeded in NRF areas. (See also the clarified NRF habitat definition as described under the comment category *Nesting, roosting, foraging habitat in this section.*)

DNR and the Service do not agree with the commentor who stated that the standards used to allow management within forest stands that are already sub-mature habitat are a high price to pay for small mistakes. The fact that management will be allowed in sub-mature habitat at all represents a high degree of confidence in the ability of foresters to manage within spotted owl habitat and still have that habitat function in the intended manner. This is still largely a management hypothesis. The standards established constitute an experimental safeguard against mistakes that could be quite expensive for spotted owls.

Of the listed factors that may be considered when conducting landscape level assessments in WAUs in which habitat has exceeded target levels, DNR is not committing to carrying out any of them in the legal sense of commitment because it would be difficult to define what constituted a legal commitment to "considering" these factors. However, the intent of this language is that DNR make a good faith effort to provide habitat in an arrangement and of quality that is optimal for spotted owls.

When existing sub-mature habitat is manipulated under the provisions of the HCP, all the characteristics described in the definition must be present in order for an additional 5 percent to be available for management activity.

The rationale for the two-year period for assessing the retention of sub-mature habitat characteristics and for a minimum period before any subsequent partial harvest can take place was developed by the Washington State Forest Practices Board Spotted Owl Science Advisory Group (SAG). Their thinking was based on the following reasons: (1) Spotted owl prey populations could be negatively impacted immediately post-harvest due to mechanical destruction of food sources, burrows, and dens; (2) Two years would allow prey populations to recover

and may allow spotted owl populations to adapt to new structural characteristics; (3) The full extent of habitat modification may not be apparent immediately post-harvest; and (4) Two years would likely allow measurement of those changes. The SAG also cited unpublished data from Lorin Hicks in which owls fitted with radio-transmitters avoided areas in which partial harvest activities had taken place for two years (Hanson et al. 1993 p.73).

The two-year, five percent guideline does not limit manipulations in sub-mature habitat to an aggregate of 10 percent during the research phase, but it allows successive five percent areas to undergo partial harvest as long as the previous 5 percent meets sub-mature characteristics.

The provision of the draft HCP to allow degradation of old forest to sub-mature outside of nest patches represents another attempt to allow maximum flexibility for DNR while providing owl habitat. The HCP Science Team viewed this option as a higher risk option than one that did not allow such degradation. The Board of Natural Resources directed DNR staff to further develop the higher risk option, which became Alternative B. If, after the nest habitat provisions have been met, along with the other requirements of the HCP, any old-forest habitat that is available for manipulation could be degraded to sub-mature habitat. It is not yet clear how much of this type of management activity will take place until the nest patches have been delineated and the marbled murrelet habitat relationship study and inventory have been completed. Experimental manipulation of old growth would occur in the OESF.

The goal of the OESF is to learn how to integrate production and conservation in managed forest, including conserving the ecosystem values of old-growth forests (draft HCP p. I.14 and 15, IV.69 through 74). In that regard, it is likely that partial cutting in old-growth forests will be one of the techniques tested to learn how to achieve that integration. The few existing studies relevant to partial-harvesting in old growth are retrospective studies of sites that were harvested for reasons other than integrating ecosystem and commodity outputs. But it is thought that partial harvesting in old growth is a silvicultural technique that might have some promise for integrating production and conservation goals (Franklin 1989, Franklin and Spies 1991, U.S. Department of the Interior 1992). One of the goals of the OESF is to learn whether, and how, it is silviculturally appropriate to conduct partial harvests in old growth.

It is likely that partial cutting in old growth will proceed cautiously in the OESF for several reasons: (1) It is not known how effective such a technique will be in meeting diverse objectives, thus thoughful experiments will need to be designed, implemented, and evaluated before larger-scale partial-cutting efforts would be initiated; and, (2) Few areas are available for such manipulative experiments because, under the spotted owl conservation strategy for the OESF, old-forest habitat can not be reduced below 20 percent of any landscape planning unit and current estimates are that only 4 of 11 landscapes have more than 20 percent of that cover type (draft HCP p. IV.77-78, 86-87). Most, but probably not all, of the estimated old-forest habitat in HCP Table IV.5 (draft HCP p. IV.78) is old-growth forest. In addition to owl conservation, partial harvest in old-growth stands in the OESF is constrained by the riparian conservation strategy, in the near term (and likely the long term as well) by the marbled murrelet conservation strategy. Without the constraints of the riparian and murrelet strategies, current estimates are that approximately 12 percent of the existing old-growth forest would be available for partial-cutting. It is likely that with full realization of the riparian and murrelet strategies, the amount of old growth available for partial cutting would be somewhat less.

Road construction would be prohibited only if such construction brought the habitat level below 50 percent in a WAU, or if it was planned to go through the 0.7- mile core of a known nest site.

If a natural event caused a stand that had been treated as part of the five percent not to meet the habitat definition, further manipulation in existing sub-mature habitat would be prohibited until that stand recovered.

Timber sale contract extensions would be granted under current DNR contract language. However, if the contract in question covered the maximum 5 percent of sub-mature habitat in a WAU, no other contracts could be offered in sub-mature habitat in that WAU for at least two years after completion of management activities under that contract. The time until the next sale would only be more than two years if the previously harvested five percent had not yet attained sub-mature characteristics.

Given the amount of spotted owl habitat that would be released from harvest restrictions due to spotted owl circles in eastern Washington, DNR and the Services do not think that the five-percent, two-year limitation on manipulation of sub-mature habitat within NRF areas is too restrictive.

The landscape assessment process used to determine amounts of habitat and plans for harvest in WAUs is not subject to NEPA review on an assessment-by-assessment basis. The results of the assessments will be reviewed by the Service only as part of monitoring plan implementation during regularly scheduled reviews.

nest patches

Summary: WDFW, the NWIFC, Point No Point Treaty Council, the Tulalip Tribes, National Audubon Society, Sierra Club, WEC, Northwest Ecosystem Alliance, Black Hills Audubon Society, nine individuals (four signers on one letter), and Bogle & Gates (a consultant to Washington State University) commented on the provisions for spotted owl nesting habitat within the HCP. The most frequent comment on this topic is that the 300-acre nest patches are inadequate. Several commentors requested that a minimum of 500 acres of nest habitat be required within a 0.7-mile-radius of a nest patch and some commentors made general requests that the amount of nesting habitat be increased. One commentor requested that 500 acres be retained around all known sites. Two commentors stated that the HCP allows less than 300 acres of high- quality nesting habitat within a nest patch. Other comments are as follows: (1) The scientific rationale for 300-acre nest patches described in the HCP is weak, and other sources indicate more habitat should be included; (2) In the OESF, riparian management zones will not provide areas large enough to provide adequate nesting habitat with interior forest conditions; (3) Criteria for success of nest habitat creation experiments during the research phase should be that a resident pair has successfully bred for a minimum of five years; (4) success of nest habitat creation should be occupation of a site by a breeding pair for three consecutive years; (5) We do not know enough about how spotted owls choose their nest sites to know whether the proposed strategy of creating nest habitat will work; (6) Research results on creation of nest habitat should be approved through a peer review process before any habitat within nest patches is harvested; (7) Nest site protection should not be based on location of current site centers; (8) DNR should acknowledge that the research phase for nesting habitat renders it impossible to predict harvest levels after the research phase is complete; and, (9) DNR assumes a heavy burden by stating that it will ensure that adequate nesting habitat is provided.

The following questions were posed regarding the nest habitat provisions of the HCP: (1) How long will it take to demonstrate that DNR can successfully use silvicultural techniques to create

nesting habitat in managed stands; (2) What are the standards for success; (3) How long will it take to locate nest habitat patches on the ground; (4) For how many WAUs must this process be completed; (5) Is the intent of the HCP not to require nest habitat patches or a research phase in the east side planning units; and (6) What is the advantage of the nest habitat approach over the spotted owl circle approach?

Response: Examination of age-class distribution data on DNR-managed lands and distribution of known status 1 and 2 site centers and an initial examination of new forest inventory data collected by DNR over the past five years show that DNR-managed lands currently do not contain enough high-quality nesting habitat to meet the requirements established in the HCP, both in terms of stand-level characteristics and landscape-level distribution of forest that contains nesting structure. By adopting the strategy of requiring two 500-acre patches (300 acres of high quality nest habitat with a 200-acre buffer of sub-mature habitat, or better) per 5,000 acres of designated NRF areas, with these patches being embedded in a larger landscape of suitable spotted owl habitat (sub-mature quality or better), the overall quality of habitat will improve over time. The riparian and murrelet provisions of the HCP will add patches of older forest habitat throughout NRF landscapes that will exceed the acreage of older forest retained in nesting habitat patches. Given all of these factors, the HCP strategy will accomplish its objective of providing demographic support to the population. The Service thinks that this is an acceptable approach.

As was noted above, the draft HCP has been modified such that all habitat within 0.7 mile of known nest sites in NRF areas will be retained.

The commentor who stated that the provisions of the HCP allow less than 300 acres of high-quality nesting habitat to be included in nest patches is in error. Habitat that meets the high-quality definition in the HCP will be included first. There are cases however, where there will not be enough high-quality nesting habitat available in a particular 5,000-acre landscape to establish a 300-acre nest patch. In such cases, the next best available habitat will be protected and allowed to develop into higher quality habitat.

The rationale described in the HCP for establishing 300- acre nest patches with a 200-acre buffer of sub-mature or higher quality habitat is based on the work of Irwin and Martin (1992). As was noted above, data analyzed by Bart (1995) and in the

Forest Practices Board FEIS for the Permanent Spotted Owl Rule (WFPB 1996a) does not give conclusive results on how much habitat spotted owls need around their nests. The HCP acknowledges that information regarding adequate amounts of nesting habitat at the stand and landscape level is less than conclusive and thus DNR has included an extensive research plan to answer these questions. DNR also commits in the HCP to provide adequate amounts of nesting habitat per the results of this research program. Furthermore, if the HCP is adopted, DNR is committed not to harvest existing habitat within 0.7 mile of known nest sites.

The comment in regard to provision of nest habitat through the OESF riparian strategy is addressed under topic heading *Nesting, roosting, and foraging habitat* in this section of the FEIS.

Comments regarding what criteria should be used to determine whether spotted owls are successfully reproducing in managed landscapes have been noted and will be considered during the development of the specifics of the nesting habitat research plan.

The commentor who noted that we do not know enough about how spotted owls choose their nest sites to know if creating nesting habitat will work is correct. The proposed strategy is a management experiment that includes monitoring and research programs designed to test the hypothesis that nest habitat can be created through management. The Service and DNR think that the proposed strategy of retaining existing nest structure in the landscape is adequate protection while these owl management questions are researched.

Research results regarding creation of nest habitat and any new management guidelines based on this research will be approved by the Service before nest habitat in the 300-acre patches becomes available for management.

In its harvest modeling of the spotted owl strategy, DNR assumed that the research phase would last for the entire permit period because it was not possible to model potential new management strategies based on the results of the research phase. The assumptions used in the harvest model are included in the FEIS.

DNR and the Services disagree that DNR is assuming a heavy burden by stating that it will ensure that adequate nest habitat will be provided. The Service cannot issue an ITP if the

applicant's proposal will appreciably reduce the likelihood of survival and recovery of a species. If DNR did not ensure provision of adequate amounts of nesting habitat in NRF areas, the Service could not issue an ITP based on this criterion.

It is not known how long it will take to demonstrate that DNR can successfully use silvicultural techniques to create nesting habitat in managed stands. This is why no time limit was attached to the research phase. The standards for success will, in general terms, be the observance of successful spotted owl reproduction for a consistent period of time in stands that have been subject to a variety of treatments which resulted in the creation of nesting structure. The specific standards for success will be determined based on the best available science regarding spotted owl ecology.

Nest patches will be located on the ground during the first field season after the HCP has been approved. Designation of nest patches will occur in a maximum of 48 WAUs. It could be a smaller number if two nest patches are placed in a large WAU. The nest patch strategy does not apply to the three east-side planning units because spotted owls nest in sub-mature habitat in the eastern Cascades.

The nest habitat patch approach is different than the spotted owl circle approach because these patches will occur within a larger landscape context in which 50 percent of NRF areas in each WAU will be in a suitable habitat condition. The circle approach results in a maximum of 40 percent habitat within a median home range radius of a site center. Establishing nest patches is a way of ensuring that nesting structure is distributed within NRF areas in a configuration thought to be used by spotted owls (i.e., habitat concentrated within a 0.7 mile area). In contrast to the former "500-acre rule", the nest patches will not constitute the only habitat available to spotted owls in the landscape.

<u>dispersal habitat</u>

Summary: Two individuals and Bogle & Gates (a consultant to Washington State University) made general comments regarding spotted owl dispersal habitat. These comments are as follows: (1) There is no scientific evidence that dispersal habitat works; there should be numbers associated with down woody debris and green tree retention portion of dispersal habitat standards; (2) There should be validation monitoring of dispersal habitat; and, (3) harvest parameters of dispersal habitat need to be clarified in the HCP.

Response: While there is no evidence that dispersal habitat will "work", there is no evidence that it will not work. The ability to create spotted owl dispersal habitat in a managed forest is a working hypothesis. Thomas et al. (1990) and the Northern Spotted Owl Recovery Team (USDI 1992b) both supported the concept of creating spotted owl dispersal habitat through forest management. In fact, the Northern Spotted Owl Recovery Team thought that providing dispersal habitat was the most appropriate role of some nonfederal lands.

The optimal characteristics of forests that can function as spotted owl dispersal habitat are not known. Current descriptions of dispersal habitat do not include down woody debris, and for this reason, down woody debris is not included in DNR's definition of dispersal habitat (draft HCP p. IV.11 to 12), but down woody debris will be incorporated if and when research demonstrated its necessity (draft HCP p. IV.18). The draft HCP states that in dispersal managment areas four green trees per acre will be retained from the largest size class (draft HCP, p. IV.12). The optimal silvicultural treatments for developing dispersal habitat are not known. For this reason, and in order to retain operational flexibility, the harvest parameters are not specified in the draft HCP.

Validation monitoring of dispersal habitat is impractical. A monitoring program that would have reasonable statistical power would be unreasonably expensive. Validation monitoring of dispersal habitat would require radio-tagging a large number of juvenile owls. The number of owls tagged and tracked through radio-telemetry would need to be very large because only a small proportion of those tagged might actually traverse DNR-managed dispersal habitat. For this reason, effectiveness monitoring is a much more reasonable approach to evaluating the value of dispersal habitat on DNR-managed lands.

dispersal-designated areas

Summary: WDFW submitted comments specific to designated dispersal areas in the draft HCP. They had recommendations for additional dispersal areas near Spada Lake and in the southern portion of the Mineral Link area.

Response: Given the areas included for NRF management, the existence of the Greider Ridge NRCA in the Spada Lake Basin and the proximity of these NRF areas to federal reserves to the north and south, DNR and the Service do not think that additional dispersal habitat designations are warranted.

In the Columbia Planning Unit, the HCP proposal has been modified to include DNR-managed lands south of the Mineral Block that occur within the Mineral Link SOSEA designated under the new state spotted owl rule as dispersal management areas (see map IV.3 in Appendix 3 of this document). Dispersal areas in the North Puget Planning Unit have also been modified such that the western portion of the Harry Osborn State Forest (west of Township 7 North) has been changed from dispersal to no role. This change is consistent with the Finney SOSEA boundary.

quality/definition

Summary: WDFW, NWIFC, Point No Point Treaty Council, Bogle & Gates (a consultant to Washington State University), and three individuals commented on dispersal habitat definitions. These comments are as follows: (1) The justification for dispersal habitat definition is not well supported by the literature, and DNR should do validation monitoring to verify usefulness of dispersal habitat; (2) Use the definition of dispersal habitat developed by Beak Consultants for the Murray Pacific HCP; (3) Include down woody debris as a component of dispersal habitat; (4) The definition for dispersal habitat needs more snags; (5) Fifty percent canopy cover does not constitute dispersal habitat; (6) Harvest age of dispersal habitat is too old; and (7) NRF habitat should be double counted as dispersal habitat so as to reduce the regulatory burden for providing dispersal habitat.

Response: It is true that the definition for spotted owl dispersal habitat is not well supported by the scientific literature, but this reflects the current state of knowledge. The definition was based on the best scientific information available. Furthermore, the definition in the draft HCP is an interim definition (draft HCP, p. IV.17). DNR's definition is very similar to that developed by Beak Consultants (1993), and DNR's definition may change over time as more is learned about the creation of dispersal habitat in managed forests. The same can be said regarding the amount of down woody debris, snags, and canopy cover.

The draft HCP does speculate about the harvest age of forests in dispersal management areas (p. IV.137), but it does not specify a harvest age. The harvest age of forests managed for dispersal habitat will depend on the landscape conditions within a WAU, but more importantly, it will depend on the final definition for dispersal habitat and the silvicultural treatments used to develop habitat.

NRF management areas also function as dispersal habitat, but counting them as dispersal habitat would not reduce the regulatory burden for providing dispersal habitat. DNR's HCP designates dispersal habitat areas in order to reduce the regulatory burden for providing NRF habitat in areas where it was thought the provision of NRF habitat would not make an important contribution to spotted owl conservation in Washington State (draft HCP p. IV.3). This strategy was considered the most efficient means to meet the purpose and need of the proposed action (DEIS, p. 1-2 to 1-4).

amounts/distribution

Summary: The Muckleshoot Indian Tribe, one individual, and Bogle & Gates (a consultant to Washington State University) submitted comments pertaining to the amount and distribution of dispersal habitat. Comments are as follows: (1) In the South Puget Planning Unit, designated NRF areas are useless without adjacent NRF areas; (2) Dispersal areas in the Klickitat Planning Unit are far from federal reserves or DNR NRF areas; and, (3) Dispersal areas farther than 2 miles from federal reserves make no sense -- the HCP itself acknowledges that lands further than two miles serve no useful function for spotted owls. One commentor wanted to know if there were spatial requirements for dispersal habitat beyond the 50 percent requirement in a WAU in western Washington and questioned how harvest calculations were made for eastern Washington given that estimates were not made of how much dispersal habitat existed in the east side planning units.

Response: There are two large blocks of DNR-managed land designated as dispersal management areas in the South Puget Planning Area. One is intended to facilitate dispersal to the Late Successional Reserve known as the Mineral Block. The other is intended to facilitate dispersal between federal Late Successional Reserves and Seattle's Cedar River watershed.

The HCP does not say that lands farther than 2 miles from federal reserves serve no useful function for spotted owls. Lands beyond 2 miles from federal reserves can serve a useful function as spotted owl NRF habitat, but the draft HCP spotted owl conservation strategy designates very little DNR-managed land beyond 2 miles from federal reserves as NRF management areas. A distance of 2 miles was used for the designation of NRF management areas because 2 miles was thought to be a reasonable compromise between DNR's trust mandate and the ESA Section 10 criteria for the issuance of an ITP. Dispersal management areas many miles from federal reserves do make

sense if they are located between large blocks of NRF habitat. For 111 juvenile spotted owls studied in the Wenatchee National Forest and on the Olympic Peninsula, the mean dispersal distance was approximately 15 miles (E. Forsman, unpubl. data; USDA Forest Service, Corvallis, OR). During the same studies, one juvenile owl dispersed 76 miles.

(B) eagles--bald

Summary: The National Audubon Society, Northwest Ecosystem Alliance, and WEC said that DNR's draft HCP was inadequate for bald eagles and that an ITP should not be issued. In particular, all three groups said that state Forest Practices Rules and state wildlife regulations are inadequate. The National Audubon Society and WEC also stated that an ITP for the bald eagle should not be issued for the east-side planning units because the prescriptions for large, structurally unique trees do not apply there.

Response: Measures for protecting eagles and their habitat include provisions for retaining large, structurally unique trees, maintenance of salmonid habitat through the conservation of riparian areas and wetlands on the west-side planning units (explained in draft HCP p. IV.46). Site-specific management plans in both the east and west-side planning units (Forest Practices Rules) will also ensure protection of active nests. These strategies and the snag and green tree retention requirements added to the HCP, (see Appendix 3 of the document) should provide an adequate amount of suitable roosting and nest structures, as well as protection of potential food sources in the west-side planning units. Most bald eagle nesting and wintering areas occur within the west-side planning units. Bald eagle populations have doubled every 6 or 7 years since the 1970's, rising 10 percent since 1993 to more than 4,500 nesting pairs (Vickery 1995). State Forest Practices Rules for bald eagles have contributed to this recovery. Therefore, it seems reasonable to DNR that continuation of this strategy will provide adequate protection of this species.

USFWS has concerns that site-specific management plans in the east-side planning units will protect only nest sites and communal roosting sites, and provide no protection of other eagle use areas such as foraging sites.

(C) falcons--peregrines

Summary: The National Audubon Society, Northwest Ecosystem Alliance, and WEC and a local organization said that DNR's draft HCP was inadequate for peregrine falcons and that an ITP should not be issued. In particular, all four groups said that state Forest Practices Rules are inadequate. The National Audubon Society and WEC also stated that an ITP for the peregrine falcons should not be issued for the east-side planning units because the prescriptions for cliffs do not apply there. The

local organization recommended more protection around peregrine nest sites.

Response: Through negotiations with USFWS additional protection for the peregrine falcon has been incorporated. Management of cliff habitats will include measures for retaining obvious perch/nest trees and trees that maintain the integrity of cliff habitat on both west- and east-side planning units. Also, DNR will survey sites identified as suitable for peregrine falcon occupancy to prevent direct harm to the species (draft HCP, Chapter IV, Section F). In addition, public access to DNR-managed lands within 0.5 mile of a known peregrine falcon aerie will be restricted, and aerie locations on DNR-managed lands will be kept confidential. State Forest Practices Rules have contributed to the increasing peregrine falcon population, which is now estimated at more than 1,000 pairs in the contiguous 48 states (USFWS 1995). The Services expect these measures, in addition to the stated commitment to limit human disturbance near known aeries, will provide adequate protection of the ecological requirements for this species.

(D) accipiters--goshawk
Summary: WDFW is concerned about the contraction of the species' geographic range. WDFW recommended that goshawk nest sites be protected through site management plans, that harvest rotations be lengthened in some areas to provide more mature forest, that more snags and green tress be retained in clearcuts, and that goshawks be protected in areas outside of NRF management areas. One individual said is was unfortunate that goshawks in the eastern Cascades would not be protected.

Response: It is outside the scope of DNR's HCP to address problems with the contraction of the geographic range of the goshawk. However, DNR does recognize that conservation measures can be developed to protect the goshawk on all DNR-managed lands. Developing an HCP is a voluntary process in which applicants are free to include whatever lands they choose in their plan. Applicants are also free to choose the conservation measures they wish to implement to get coverage for unlisted species. DNR chose not to include conservation measures for goshawks east of the Cascade crest. If the goshawk becomes listed, DNR will not be issued an ITP for goshawks where they occur on DNR-managed lands on the eastside. In the west-side planning units goshawks will likely benefit from the owl, murrelet, and riparian ecosystem conservation strategies. Murrelet habitat, as well as owl NRF management areas and dispersal habitat, will provide potential nesting structures and dispersal habitat for goshawks. The riparian buffers will also provide potential nest structures that likely will be protected when adjacent stands develop. Within NRF management areas all active goshawks nests will receive seasonal protection. The strengthened snag and green retention tree conservation strategy will also be a source of

potential nest structures, especially the commitment to retain large, unique wildlife trees and one tree of the largest size in each harvested unit (Appendix 3, Chapter IV, Section F of this document). These strategies contain provisions for some habitat to continue to grow and develop throughout the HCP term (e.g., the 300-acre nest patches, occupied murrelet stands, and riparian buffers) while other potential goshawk habitat such as sub-mature stands in NRF management areas will move around the landscape. Although extending harvest rotations and/or site management plans would provide additional benefits to goshawks, it is anticipated that goshawk habitat will be available in some areas of all west-side planning units as a direct result of the HCP conservation measures. These conservation strategies, which take a habitat-based approach, will be in addition to protection required by state law to protect from harvest snags or trees known to contain active goshawk nests.

iii. Passerines

(A) Vaux's swift

Summary: WDFW said that lack of snags in certain regions may lead to low populations of Vaux's swifts. NWIFC said that determining whether a hollow snag is a Vaux's swift nest site can only be done during the nesting season. Bogle & Gates (a consultant to Washington State University) wanted to know the impact on harvesting of the mitigation measures for Vaux's swifts.

Response: The green tree retention provision of the HCP, which was better in quality than state Forest Practices Rules, has been strengthened to include a total of five green trees. In addition to the large, structurally unique tree and one from the largest size class of living trees, three more green trees will be retained from the codominants (Appendix 3, Chapter IV, Section F of this document). A provision to retain snags has been added to this conservation strategy. DNR will leave three snags greater than or equal to 20 inches dbh where possible, with a minimum dbh of 15 inches. Where snags at least 15 inches dbh are not available, a one-for-one replacement will be made with green trees. Preference will be shown for hard snags, and large hollow snags greater than or equal to 40 feet in height. All leave trees will be left in the harvest unit, and through subsequent rotations, thus ensuring they continue to function as wildlife trees. This measure to protect current snags and provide future snags should result in the availability of potential Vaux's swift habitat on DNR-managed lands throughout the HCP area. Instead of attempting to determine whether specific snags are used by Vaux's swifts to justify protecting the snag, a preference for retaining large, hollow snags likely to be used by Vaux's swifts (and other wildlife) is built into this conservation strategy, thereby negating the need to conduct Vaux's swift surveys during the nesting season. The Department of Labor and Industry standards preclude the retention of all snags. Only safe snags will be

retained, and therefore there should be no impacts to timber harvesting with implementation of this part of the strategy. There will be some impacts to harvesting with the retention of additional green trees in that not all trees available for harvest under state Forest Practices Rules will be harvested. The intent of retaining these trees is to provide habitat for a variety of currently unlisted species to, hopefully, preclude future listings and additional harvest restrictions and provide adequate mitigation for the take of unlisted species that may occur in the future while conducting timber harvest activites.

c. Reptiles

Summary: The Northwest Ecosystem Alliance requested more protection for riparian and wetland areas because six of Washington's reptile species are associated with wetlands. One individual expressed a concern for pond turtles because of their role in the food chain.

Response: A goal stated in DNR's HCP is " no net overall loss of naturally occurring wetland acreage and function". The draft HCP contains riparian protection of Types 1 through 3 streams and wetlands protection for wetlands greater than 0.25 acre in the form of buffers that will be 100 feet wide or a site potential tree, whichever is greater. Type 4 streams will have 100-foot buffers on each side of the stream, and it is expected that at least 50 percent of Type 5 streams will have buffers resulting from the strategy to protect steep and unstable slopes. All the buffers will be measured on the horizontal distance, a provision that has been changed from the draft HCP (Appendix 3, Chapter IV, Section F of this document). A minimum basal area of 120 square fee per acre will be maintained in the forested portions of wetland buffers. The wetlands buffer should provide adequate protection for the types of marshes, ponds, sloughs, and small lakes the western pond turtle has been known to inhabit. DNR must still adhere to state Forest Practices Rules that require a SEPA environmental checklist for activities within 0.25 mile of a known individual occurrence of the western pond turtle. However, these additional measures should ensure that the loss of habitat for wetland-dependant species will not occur.

d. Amphibians

Summary: WDFW was concerned about the protection of forested talus for the Larch Mountain salamander. NWIFC said that buffers should be placed on Type 4 and 5 streams because they are important as amphibian breeding habitat. They also asked how the Services will calculate the number of individuals incidentally taken if an amphibian species is listed in the future. Point No Point Treaty Council suggested amphibian surveys be part of the evaluation of effects of forest management activities along Type 5 streams. Point No Point Treaty Council and WEC said that seeps, Type 5 streams, and moist talus should receive greater protection because they are inhabited by Van Dyke's salamander. The Northwest Ecosystem Alliance requested more protection for riparian and wetland areas because amphibians are sensitive to changes in hydrology, water temperature, and substrate characteristics resulting from timber harvest. A local group urged

DNR to design harvesting plans that will allow the dispersal of less mobile species such as amphibians. An individual pointed out that the dissapearance of frogs and toads change the food chain and asked whether research information would indicate habitat restoration that will continue the food chain.

Response: Concerns about the Larch Mountain salamander are addressed in the response to concerns about special habitats (see p. 3-13 in this section) and in the response to concerns about adequate protection of talus (see p. 3-17 and 3-18 in this section). The effects of the Riparian Conservation Strategy for the five west-side planning units and the Olympic Experimental State Forest are detailed in the DEIS, p. 4-396 to 404. The Services and DNR believe that the buffers of a site potential tree height or 100 feet, whichever is greater, on both sides of Type 1 through 3 streams, and 100-foot buffers on both sides of Type 4 streams are scientifically justified and would provide all the important habitat elements necessary for protecting amphibians. This is particularly true for stream-breeding amphibians. All Type 4 Waters that were classified prior to January 1, 1992, must either be verified in the field or assumed to be Type 3. Type 5 Waters are considered important to amphibians, as well, and all Type 5 Waters flowing through an area with a high risk of mass wasting will be protected according to the subsection titled Unstable Hillslopes and Mass Wasting (draft HCP, p. IV.56 and 57). It is expected that 50 percent of these streams will be buffered through this strategy. A 10-year research program will be initiated to study the effects of timber activities along Type 5 Waters (draft HCP, p. IV.54). As a result, a long-term conservation strategy for Type 5 Waters will be developed and incorporated into the HCP. Outer wind buffers will be applied to protect the riparian buffer in areas that are prone to windthrow. Types 1 and 2 Waters, and Type 3 streams wider than 5 feet, with moderate potential for windthrow, will receive 100-foot and 50-foot wind buffers, respectively, along windward sides. Where riparian buffers could be subject to strong winds, wind buffers will be placed along both sides providing additional protection to riparian obligate species. These measures will result in a forested network of riparian buffers made up of many dispersal corridors for amphibians and many other riparian obligates. Documentation shows, several species of frogs benefit from the herbaceous cover and subsequent increases in local invertebrate populations provided by recently harvested areas. An increase in sunlight reaching a small stream or wetland has also been shown to increase aquatic invertebrate populations, thus providing a short-term increase in the forage base for stream-dwelling amphibians.

Implementation monitoring will document the types, amounts, and locations of forest management activities carried out on the plan area. Effectiveness monitoring will document changes in habitat conditions, including general forest structures and specialized habitat features (e.g., large woody debris). Monitoring will ensure that habitat requirements for amphibians are met. Specific populations will not be surveyed or monitored, rather habitat will be monitored by comparing it to the baseline condition if quality and quantity over the life of the plan. In the event that a species' further existence might be jeopardized by the action (the HCP), the strategy for that species will be reevaluated and

amended appropriately to address the species needs. The premise of the HCP is to preclude the need to elevate the status of an unlisted species by providing adequate habitat for that species through the provisions of the plan. Without a conservation plan, an unlisted species receives little consideration. The Services and DNR are confident that habitat for amphibians on the plan area will improve as a result of the measures undertaken in this HCP and that this improvement will in turn not contribute to the subsequent need to elevate the present status of amphibians as a result of activities carried out under DNR's HCP.

i. Frogs (in section 3.3 only)

e. FISH

Summary: The American Rivers group stated that healthy fish populations and rivers are of critical importance to the economy of Washington. Fifty-one individuals (and identical letter sent by 51 individuals) commented that riparian areas are very important to all kinds of fish. One individual pointed out that DNR works for the public and that there is a responsibility to protect fish for the public.

Response: DNR agrees that it is important to maintain healthy fish populations in the streams that drain DNR-managed lands and other lands as well. The riparian strategy that is presented in the draft HCP on pages IV.51 to 67 is a scientifically based attempt to provide a protection and restoration strategy for fish habitats on DNR-managed lands.

i. Anadromous salmonids

Summary: Clallam County believed that habitat degradation is not the problem, overfishing is. The Squaxin Indian Tribe commented that most Washington streams lack most salmon habitat components. The tribe also said that the state of knowledge about salmonids and riparian zones is such that the trends are toward increased protection, and therefore, marginal improvements over current practices are simply not adequate to protect these resources over the long term. The tribe was concerned about protection of salmon through treaties that were signed between the tribes and the federal government. The Elwha/Clallam Tribe said that they are mostly concerned about watershed health and salmon populations. The Hoh Indian Tribe asked how the OESF will fit with the wild salmon policy. The Tulalip Tribes suggested that DNR develop information on the potential limiting factors for each species and quantify this, where possible, for existing stocks.

Bogle & Gates (a consultant to Washington State University) stated that salmon are already protected by current regulations, policies, and guidelines. The Northwest Forestry Association stated that just using salmonid freshwater habitat as a "proxy" to evaluate the effects of riparian conservation says that fish are of no consequence; therefore, numbers of fish should be evaluated with proper acknowledgment of factors influencing this data. The

Mountaineers said that protection of salmonids and salmon habitat is a very important part of the whole HCP strategy.

A local group said the most critical issue for salmon is "...how to best sustain propagation in our streams." An individual commented there is a need to protect and restore crucial salmonid habitat on DNR-managed lands, or to curtail land-use activities on DNR-managed lands that negatively impact salmonid habitat outside of DNR-managed lands. Also, he said that DNR's draft HCP failed to utilize state-of-the-art salmonid or forest invertebrate conservation biology. The same individual also pointed out the need to think more on a watershed basis of the effects of clearcuts on stream habitat.

An individual said that DNR must protect spawning grounds. Another individual said that salmon declines are caused by timber harvest. An individual stated that the HCP Alternative B riparian protection is not enough to protect salmon. Many individuals (51) implied a need to protect the remaining old-growth timber for salmon.

Response: Recent reviews of the status of Pacific Northwest salmon stocks indicate that many are either already extinct or are in an at-risk status. The causes of these declines have been summarized into four general categories: (a) overharvest of weaker stocks, (b) problems caused by hatcheries, (c) hydropower facilities, and (d) habitat loss. Nehlsen et al. (1991) concluded that there is a need for a paradigm shift that "...advances habitat restoration and ecosystem function...for many of these stocks to survive and prosper into the next century." Undoubtedly the decline of pacific salmon has come from myriad of impacts, and to solve this problem will require the recognition by all impactors of the need to do their part to work toward a comprehensive solution.

DNR is aware of the status of salmon stocks in Washington, as is pointed out on pages III.66 through III.73 of the draft HCP, and understands the need to develop a comprehensive, scientifically based approach to habitat protection to put salmon habitat on the road to recovery. DNR believes that the riparian conservation strategy for the five west-side planning units presented on pages IV.51 through 67 of the draft HCP is just such an approach.

The large number of instances in which habitat degradation and simplification have been cited as a factor in salmonid stock declines suggests that loss of critical habitat has played an important role in some extinctions, particularly species spending extended periods in fresh water and undertaking extensive seasonal movements within the drainage system. At present there is little direct evidence that diversity of fishes has been reduced in simplified streams in the Pacific Northwest because few studies have attempted to relate fish community composition to habitat characteristics (Bisson et al. 1992). Some of the few studies that have addressed loss of habitat diversity after logging were carried out by Erman et al. (1977) on aquatic insects and Bilby and

Bisson (1992) on loss of diversity in forms of terrestrial organic matter entering streams. Bisson and Sedell (1984) found that streams in western Washington from which logging debris had been removed had fewer pools and longer riffles than streams in old-growth forests. Although total salmonid biomass was greater in logged and cleaned streams than in old-growth sites, the communities were dominated by underyearling trout and there were proportionately fewer older trout.

Most salmon streams on DNR-managed lands have been logged in past years at least once. The lack of understanding of watershed processes and riparian function during those years often resulted in salmonid habitat degradation due to logging, and today many streams are still recovering from past practices. There is a clear recognition in the draft HCP riparian strategies (p. IV.54) of the need to "...maintain and restore the quality of salmonid habitat..."

As explained in the Forest Resource Plan, the protection of salmon habitat on DNR-managed lands is a legitimate objective for the department. The purpose of the riparian conservation strategy for the five west-side planning units (draft HCP, Chapter IV, p. IV.51 to 68) is to meet this objective. After exhaustive literature review, it was concluded that the No Action alternative was not sufficient to protect salmon habitat. That alternative did not address the riparian ecosystem needs to the extent that was called for in the literature, and it did not sufficiently address logging near drainages on steep and unstable slopes. Restoration of riparian ecosystems is an objective of riparian management, and this is discussed on pages IV.54 and 55 of the draft HCP. A restored riparian forest will lead to the natural recovery of inchannel habitat, a recovery that will be sustainable through the long term. Active restoration of inchannel salmon habitat (i.e., log placement, gravel supplementation, etc.) is a separate issue outside the commitments of the draft HCP, but one that can still be accomodated if the Board of Natural Resources approves the HCP. Along with forest management in RMZs, attention paid to unstable slopes and mass wasting, road network management (draft HCP, p. IV.56), hydrologic maturity in the rain-on-snow zone (draft HCP p. IV.56 and 57), and wetlands protection (draft HCP, p. IV. 57 and 58) are an attempt to address salmon habitat protection on a watershed basis.

DNR thinks that Alternative B is clearly a scientifically sound approach to riparian ecosystem protection and one that is justifiable under the current DNR Trust mandate.

The counting of salmon will definitely help monitor the effectiveness of the various habitat protection measures that have been brought out in the draft HCP. Monitoring salmon populations (both catch and spawning escapement numbers) is the responsibility of the WDFW, not DNR.

(A) coho
Summary: An individual commented there is a need to protect small streams to benefit coho salmon.

Response: Coho salmon are the most ubiquitous salmon species, utilizing many different kinds of habitat, including not only mainstem rivers, but also the innumerable medium to small headwater tributaries and floodplain wall-base channels. The intent of the draft HCP riparian strategy is to protect all water types -- large and small streams, lakes, ponds, and wetlands.

ii. Resident salmonids

(A) bull trout
Summary: The WDFW said that bull trout are extremely sensitive to water temperature and that work around Type 5 Waters could compromise the state or federal government's ability to avert an elevated listing of bull trout. WDFW recommend future research on this species. The Yakama Tribe pointed out that several eastern Washington bull trout populations are in jeopardy, "yet no emphasis is placed by DNR in the draft HCP or Draft EIS (for bull trout on the east side)."

A local conservation group suggested that DNR "...check for bull trout and wherever present should ensure that their habitat requirements such as cool water temperatures are being met." An individual stated that USFWS should not issue a permit to DNR because of the inadequacy of the buffers on Type 1 through 4 Waters and discretionary buffers on Type 5 Waters. An individual expected bull trout will probably be listed in western Washington some time in the next 100 years. Many individuals (51) said there is a need to check for bull trout on DNR lands and, whenever they are present, to ensure that their habitat requirements, such as cool water temperatures, are being met and that this should apply to the waters upstream of bull trout habitats as well.

Response: Protection of bull trout, a member of the collective family of salmonids, is assumed to occur in the five west-side planning units under the draft HCP riparian conservation strategy. Bull trout can be found in streams on both sides of the Cascade Range, and those within the west-side planning units will benefit from the draft HCP. DNR-managed lands east of the Cascade crest are not covered by the draft HCP riparian conservation strategy.

f. INVERTEBRATES
Summary: The Northwest Ecosystem Alliance, The Mountaineers, two local environmental organizations, and 51 individuals commented on invertebrate species issues. The Northwest Ecosystem Alliance requested more protection for riparian and wetland areas because 248 terrestrial invertebrates are associated

with wetland and riparian habitats. The 51 individuals, who mailed an identical form letter, questioned how DNR could provide for all species, including invertebrates, if all old-growth forest on DNR-managed lands is to be "quickly liquidated." The Mountaineers and one local organization assert that DNR's draft HCP does not adequately address forest invertebrates.

Response: The riparian conservation strategy for the five west-side planning units and the OESF, detailed in the draft HCP, Chapter IV, parts D and E, will provide habitat for invertebrates. The Services and DNR believe that the buffer widths of a site potential tree height or 100 feet, whichever is greater, on both sides of DNR Types 1 through 3 Waters, and 100-foot buffers on both sides of Type 4 streams is justified and would provide a substantial amount of the important habitat elements necessary for protecting invertebrates in the riparian and some habitat for upland invertebrates. Type 5 Waters flowing through an area with a high risk of mass wasting will be protected according to the subsection titled Unstable Hillslopes and Mass Wasting (draft HCP, p. IV.56 and 57). It is expected 50 percent of these streams will be buffered through application of this strategy providing protection for invertebrates in headwater areas. These measures will result in a forested network of riparian buffers made up of many dispersal corridors for riparian obligates and other species.

The conservation goal for wetlands is to allow no overall net loss of naturally occurring wetland acreage and function. Wetland buffers will be 100 feet with low ground disturbance which should protect the invertebrates associated with wetlands and adjacent vegetation. Additional protection is provided for bogs and mineral springs, which are specialized habitat types (Appendix 3, Chapter IV, Section F of this document). Protective measures have been developed for other special habitat types such as talus, caves, and cliffs. The conservation strategies for these special habitat types in conjunction with the murrelet, owl, and riparian ecosystem conservation strategies provide some protection for all habitat types that occur on DNR-managed lands within the range of the northern spotted owl. This includes old-growth forests. Old-growth stands occupied by murrelets will be protected in the short term until a long-term plan is developed with the USFWS. It is anticipated that some potential murrelet habitat will be harvested, however, many occupied murrelet stands will be protected. The owl strategy in the OESF Planning Unit is designed to retain old-forest habitat, most of which is old growth, at a level that is 20 percent of each of the OESF planning units. The result of this strategy is that much of this old growth will remain until such time as DNR can demonstrate to USFWS that they can replicate the structure and function of old growth. Old growth will also occur in the other west-side planning units as 300-acre nest patches distributed throughout the landscape. Although these are not large acreages, they will provide refugia for many old-growth-dependent invertebrate species.

The premise of the HCP is to preclude the need to elevate the status of an unlisted species by providing adequate habitat for that species through implementation of the plan. Without an HCP, an unlisted species receives little

consideration. The Services and DNR are confident that, overall, habitat for invertebrates on the plan area will improve as a result of the measures undertaken in this HCP and that this improvement will in turn avoid the subsequent need to elevate the present status of invertebrates as a result of activities carried out under DNR's HCP. Specific populations will not be monitored, rather habitat is monitored by comparing it to the baseline condition in quality and quantity over the life of the plan. In the event that a species' further existence might be jeopardized by the HCP the strategy for that species will be reevaluated and amended appropriately to address the species needs.

i. Lepidopterids

Summary: One local group recommended that 50 percent of currently existing potential Oregon silverspot butterfly habitat be protected.

Response: No existing potential Oregon silverspot butterfly habitat is known on DNR-managed lands within the planning area. A small parcel of potential habitat on Long Beach Peninsula was sold to the State Parks and Recreation Commission in 1994. (See DEIS, p. 4-353.)

g. OTHER WILDLIFE ISSUES

i. Listed species and species of concern

Summary: A local organization requested that sensitive species be protected to prevent their decline to levels requiring that they be listed as threatened or endangered. Fifty-one individuals, using the same form letter, requested that sensitive species be protected everywhere they occur, not just in NRF Management Areas. Two other individuals claimed that DNR's draft HCP would "wipe out" half of the remaining endangered species in Washington in the next 10 to 20 years. Another individual asserted that very little evidence was presented that additional protection of endangered species is necessary. One individual asked if recovery is a goal, then how many years of new management practices are necessary?

Response: The HCP proposes a habitat-based approach to conservation for all species, including species of concern. The primary assumption with regard to the goal of the unlisted species conservation strategy is if adequate amounts of habitat of sufficient quality are provided, these species will persist. The question is whether the combination of the described protective measures, natural diversity within the habitats on DNR-managed lands, and the diversity of treatments to be implemented under the HCP would provide a sufficient amount of habitat. Without an HCP an unlisted species receives little consideration.

The HCP is the principle document supporting DNR's application for incidental take permits and unlisted species agreements. The Services can issue incidental take permits and unlisted species agreements only if the HCP satisfies the criteria listed in Section 10 of the ESA. Additionally, the overall

multispecies conservation strategy of the proposed HCP is designed to provide sufficient protection of habitat for species of concern to meet Section 10 needs. Through negotiations, DNR and the Services have agreed to modifications of the draft HCP that will improve habitat protection for species of concern. These modifications include strategies relating to snag and green tree retention, talus, cliffs, balds, and springs and seeps. The overall multispecies conservation strategy of the proposed HCP should provide better protection of habitat for species of concern than Alternative A.

Implementation of the HCP is unlikely to "wipe out" half of the endangered species in the state of Washington. The Services think perhaps the commentors were referring to the fact that the HCP would have negative impacts on between 123 and 151 known and projected spotted owl site centers whose regulatory circles overlap DNR-managed lands. These sites would be at risk for incidental take and they represent between 40 and 49 percent of known and projected sites impacted by DNR-managed lands. (See response under the heading Old-Growth Habitat in this section.)

Whether additional protection of endangered species is necessary is a contentious issue. For the marbled murrelet, there is a high degree of uncertainty about population sizes and rates of population change, therefore, DNR has proposed a conservative approach to habitat management.

Recovery is the goal for threatened and endangered species. The number of years that new management practices will be necessary depends on the species. The recovery or listing status of listed species is periodically reviewed, but estimates of the time period until full recovery are rarely attempted. For most listed species, accurate estimates of a recovery period are difficult, if not impossible, to calculate.

E. ECOSYSTEM HEALTH

Summary: Washington Wilderness Coalition, one local organization, and 64 individuals, 51 of whom used an identical form letter, expressed concerns about ecosystem health. The vast majority of these comments requested that ecosystems be preserved or adequately protected. A few such requests used the terms "ecologically sound" or "sustainable" to describe the protection of ecosystems. The Washington Wilderness Coalition believed that Alternative C comes closer to ensuring the health of forest ecosystems. One individual asserted that the ESA should be used to preserve ecosystems. One individual stated that DNR's draft HCP is ecologically sound. Another individual said that more research is needed to improve our understanding of ecosystems.

Response: DNR's proposed HCP is a habitat-based plan consisting of conservation strategies whose essence is ecosystem health. Without the means to provide for long-term productivity and management flexibility, DNR would not be meeting its trust obligations. The monitoring program and the research program provide the tools to refine the conservation strategies through time, as new knowledge is gained.

V. HUMAN ENVIRONMENT

Summary: One local chapter of a national conservation organization and four individuals provided comments on the Human Environment. One individual asserted that managing for predators is unsafe for humans. A commentor wrote that an increasing human population increases pressure on state forests to produce revenues. Two individuals commented that the HCP undermines the ESA and is therefore harmful to the human environment. Black Hills Audubon Chapter wrote that ancient forests need to be protected, not just for biodiversity, but to perhaps provide healthful benefits to humans that are as yet undiscovered.

Response: The Services agree that certain predators can be dangerous to humans. The Services and DNR disagree that managing habitat to mitigate for the possible incidental take of certain wildlife species is inherently dangerous to humans. The Services acknowledge the various pressures our growing population creates on the state's forests. The Services note that the abilitity of nonfederal landowners and managers to prepare HCPs is provided in the ESA and therefore are one method of complying with the ESA.

A. ECONOMICS

Summary: Environment Resource Center, GBA Forestry Inc., Inland Wood Specialties, Green Crow, Mt. Baker Plywood, Washington State Association of Counties, Cascade Hardwood, State Representative Mark Schoesler, City of Port Angeles, Port of Port Angeles, American Rivers, Clallam County Commissioner Phillip Kitchel, Northwest Forestry Association, Washington Forest Protection Association, Washington Contract Loggers Association, Bogle & Gates (a consultant to Washington State University), Merrill & Ring, Northwest Timber Workers Resource Center, Western Hardwood Association, and 7 individuals all provided comments on the Economic Effects Analysis provided in the DEIS. While some commenters focused much of their comments on the economic analysis, others mentioned it among many other topics on which they also provided comments. However, all comments fell into one of the following categories:

- The DEIS needs to provide more details on the derivation of the projected harvest levels that were used to develop the economic effects analysis;

- Provide more specific information about the assumptions and methods used in estimating both the harvest levels and the economic effects;

- The analysis should also provide regional effects to income as well as to employment;

- Economic effects include degradation of fish resources;

- The analysis should use a greater range of sensitivity analysis;

- The analysis failed to consider the effects of the proposed HCP on "X resource." X resource ranged in comments from operational costs at the unit or stand level, to the effects on specific industries, such as those based on hardwood supplies; and

- The analysis cannot possibly be any good because it is only five pages long.

The Services and DNR also received commentary and criticism for not including an analysis of the effects on trust revenues under the proposed action. Again, these types of comments took several, related forms. Predominantly, commentors requested information on overall effects of implementing an HCP on income to the trusts. A very few commentors suggested the analysis should predict effects on revenue flows on a trust-by-trust basis for all 26 trusts.

Response: The Council on Environmental Quality has addressed, in NEPA implementing regulations, the need for economic analyses in environmental documents. Specifically, when an environmental impact statement is prepared and economic or social effects are interrelated with natural or physical environmental effects, then the environmental impact statement will discuss all of the effects on the human environment (40 CFR 1508.14). Determining what economic variables are interrelated to issuance of this ITP has been the subject of much attention preceding the preparation of the DEIS. Obviously, many of the measures of economic effect are influenced by factors (such as those suggested by commentors for inclusion in the present analysis) well outside the scope of the process of issuing a Section 10(a)(1)(B) ITP. Examples of such influences include market and nonmarket factors. On the one hand, the volume of timber harvest is clearly affected by the proposed action and was predicted by DNR. On the other hand, any attempt to address the myriad economic factors outside the scope of the proposed action, for example grade and species of timber, would have been outside the scope of the necessary analysis.

The analysis of the impact of the proposed HCP alternative on regional employment, by planning unit, was performed by the USFWS. Regional employment was selected as an indicator of predictable economic effects for this HCP largely because of the interrelation of this economic measure with the human environmental effects of the proposed action. Furthermore, the effects of similar actions on employment has been a prominent concern of both the government and affected communities in recent years. For example, the economic effects analysis performed for the SEIS on the President's Northwest Forest Plan focused primarily on the effects of the alternatives on regional employment. Similarly, economic effects analyses performed in NEPA environmental documents for the analysis of other recently approved HCPs in this region have focused on local employment effects (Plum Creek Timber Company and Weyerhaueser Millicoma). Where the land base involved in recently approved HCPs was too small to have appreciable effects in the local community, analyses have focused on employment effects within the applicant's own business (Port Blakely Tree Farms and Murray Pacific Corporation).

Perhaps the strongest precedent for performing an employment impacts analysis for the environmental documentation prepared for the present proposed action, was the Environmental Assessment prepared for the Oregon Department of Forestry's (ODF) Elliott State Forest ITP application. ODF, a state forest land manager overseeing commercially productive forests under mandates similar to DNR's, assisted the USFWS preparation of their Environmental Assessment, including the economic effects analysis.

That analysis examined the effects of various predicted harvest levels on employment and income in the affected communities there. While the size and scope of DNR's proposal are larger than was ODF's, the core criteria in forming the scope of the economic analysis are the same: The action proponents are both state agencies that manage state forest lands under similar revenue production and resource protection mandates.

Following the precedent of prior ITP applications, the USFWS performed the employment effects analysis based upon the same harvest level predictions that DNR developed for its presentation of effects on trust revenues made to the Board of Natural Resources in 1995. While the analysis did not include effects on income in affected communities, a regional income analysis has been prepared in response to comments and is included in the FEIS. On the other hand, DNR had already prepared and presented an analysis of predicted effects on trust revenues to the Board of Natural Resources, in public meetings, in advance of the publication of the DEIS. Since DNR need not prepare an economic analysis for its SEPA purposes, a written version of the trust income analysis was not prepared for the DEIS.

In response to public comments, the Services and DNR have provided information regarding the assumptions DNR used in developing the harvest predictions for its trust presentation, and that the Services relied on in preparing the DEIS's employment effects analysis. A discussion of the assumptions used in developing harvest level projections appeared in an unpublished DNR report entitled, "Background and Analytical Framework for the Proposed Draft Habitat Conservation Plan." For the convenience of commentors requesting this background information, the chapter of that report that discusses the underlying assumptions used by both DNR and USFWS has been attached to this document, and can be found in Appendix 5. A two page synopsis of methods used by DNR to develop the harvest level projections is also included in Appendix 5 of this document.

In response to suggestions about the contents of the analysis, the Services emphasize that an HCP such as the one at-issue here, is a programmatic document composed of the elements stated in ESA Section 10(a)(2)(A). Suggestions were made that the EIS expand the level of analysis of silvicultural effects and logging operations effects. A suggestion was made that the analysis consider the effects of natural regeneration regimens. These suggestions would be more appropriately made regarding an operations-level proposal, not for a programmatic proposal such as the present proposed action. For an HCP, forest practices changes at the stand or unit level are rarely analyzed except to discuss prescriptive aspects of take mitigation, if at all. In recently approved forest land HCPs in this region, analysis of economic effects of stand level operational factors has not been conducted. Accordingly, analysis of issues such as the effects of the proposed action on the costs of operating in individual sale units is beyond the scope of the present analysis, and not examined.

In response to comments regarding the derivation of the projected harvest levels, the methods used by DNR to develop those projections are provided in this document, as mentioned above. The manner in which those projections were used by USFWS in

developing the analysis of effects on employment was provided in the DEIS in section 4.10.

In response to comments suggesting the analysis would be more complete with an accompanying analysis of regional income effects, the Services have prepared an analysis which is presented in Section 2 (Changes to the DEIS) of this document.

In response to those comments requesting the analysis be conducted by trust land base, the Services and DNR reiterate that the projections themselves were conducted by planning unit, without differentiating amongst the individual trusts. This approach reflects DNR's desire to prepare the HCP without separating the individual trusts. Since the harvest level projections were generated by planning unit, regional employment and income analysis was conducted by planning unit as well.

In response to those requests for a baseline analysis for comparison of economic effects, such an analysis is presented in the DEIS. NEPA's core tasks of public disclosure and informed decision making are accomplished by comparison of the increment of effects amongst the several action alternatives and the No Action alternative. The baseline for comparison is the level of effects that would occur under the No-Action Alternative. As presented in the DEIS, the effects of the proposed action (employment levels under the proposed HCP alternative) are compared to the effects of no action (employment levels under the No Action alternative). This comparison is typical of NEPA analysis. The DEIS analysis has been enhanced in response to public comment by including analysis of effects to income by planning unit as well.

In response to comments that the analysis should consider nonextractive values or values from sources other than timber that can be derived from forest management such as special forest products and recreation, the Services and DNR note that these values were considered in response to scoping. DNR informed the Services that it already derives some value from these resources and that no change of income would accrue regardless of the alternative selected. Accordingly, the Services did not analyze effects to these resources. The Services note further that in scoping the proposed action, development of an alternative based on emphasizing income from these sources was considered but eliminated from detailed analysis as beyond the scope of alternatives that DNR could practicably implement. This determination was based on the fact that DNR's mandate regarding income would make such an alternative too expensive to implement based on forgone timber harvests and the fact that DNR derives a very small percentage of Trust Revenues from the harvest and sale of these resources.

In response to comments suggesting that the economic analysis should account for the effects of the proposed action on salmon and the industries that rely on them, the Services note, as explained elsewhere in this section, that implementation of the proposed HCP would have a net beneficial effect on this resource, and an induced net benefit to any sector that relies on this source. This is supported by the analysis provided in the EIS of the effects of the proposed action on habitat factors that would receive beneficial treatment as the result of implementing the proposed HCP.

In response to those commentors that suggested the analysis is inadequate because, proportionally, it is too short, the Services are mindful that ultimately, the responsible official has to make its decision on permit issuance in light of the statutory permit issuance criteria stated in ESA Section 10(a)(2)(B). NEPA analysis expands on these criteria by ensuring the decision maker also considers other factors that the ESA may not require, such as effects on the human environment. However, where the difference in effects to a certain resource is insignificant, NEPA demands no further attention to those resources. Effects are considered insignificant where, among other things, no net adverse effect is predicted.

B. SOCIAL

Summary: Rivers Council of Washington suggested DNR consider how the HCP could bring about a political, social and cultural climate of stewardship among private landowners.

Response: If an HCP has the effect described by the commentor, then that is an unexpected beneficial result of the Section 10 process. Purposefully achieving that result is beyond the scope of the proposed action and has not been analyzed.

C. CULTURAL

Summary: The Muckleshoot Tribe commented that DEIS Table 4.9.2 does not mention trade corridors to Stampede Pass. The Yakama Indian Nation stated that a professional archaeological survey is necessary for every project prior to any ground-disturbing activity and that a tribal cultural specialist should be consulted regarding non-archaeological resources for each project. The Tulalip Tribes asked that survey techniques to identify cultural resources and management responses to avoid impacts to those resources be defined. Both the Tulalip Tribes and Yakama Indian Nation mentioned that despite procedures for protection of culturally important sites in the HCP, they have yet to be contacted by DNR prior to site operations that might have affected such sites.

Response: Table 4.9.2 is illustrative, not comprehensive. Omission of any particular resources of cultural import was not intended to imply that such resources would be ignored under the proposed action. Instead, the Services believe that project level effects should be adequately addressed under the procedures described in the DEIS. The Services were disappointed to receive reports from at least two individual Tribes that DNR had yet to comport with those described procedures. The Services expect that the commitment to those procedures will be upheld as the Services have relied on those commitments in assessing DNR's mitigation commitments. Furthermore, complying with the stated commitments is a condition of permit issuance. As such, failure to comply with those commitments would be grounds for suspension or revocation of the requested permit.

D. RECREATION

Summary: An individual member of the Blue Ribbon Coalition commented the HCP could result in recreational land use closures, which the commenter vigorously opposed. One individual commented the demand for recreational use is increasing.

Response: Different recreational users have different recreational needs. While some may see closures as degrading the recreational experience, others prefer closures for enhancing recreational experiences. The proposed plan and each of the other alternatives contemplate varying degrees of riparian protection forest management, harvest deferral, and road closure, all of which directly and indirectly affect the quality of the recreational experience as well as affecting the quality and quantity of fish and wildlife habitat. Some recreational experiences would be enhanced while others would be diminished. The Services do not purport to pass judgement on which recreational experiences are preferable to others. Instead, the Services believe that, as mentioned above, the measures in the proposed HCP will have a variety of effects, none of which will be significant, on the recreational resource.

State trust lands were designated in the Enabling Act, State Constitution, and other state law to provide support to the trust beneficiaries in perpetuity. DNR has proposed the HCP and is seeking an ITP as a prudent trust manager. Recreation is a secondary benefit that cannot legally interefere with the trust mandate.

E. AESTHETICS

Summary: Several individuals and one timber industry member provided comments on aesthetics under the proposed HCP. One individual wrote that one of the responsibilities of local, state and federal government is to preserve the aesthetic qualities of the landscape. A forester with Merrill & Ring wrote that as buffers protecting Type 4 and 5 waters "unravel," they would become unsightly. Several individuals wrote that continuing forest management and clearcutting makes the state less aesthetically appealing to visitors and residents.

Response: Under NEPA, the action agencies are responsible for addressing effects on the aesthetics of the human environment where, on a net basis, those effects are significant. Almost all of the lands that would be covered under the proposed HCP, are presently managed as commercially productive forests. This primary land use would continue whether or not an ITP is issued and HCP implemented. As for the unsightliness of added protection for Type 4 and 5 streams, the Services note that most comments on aesthetics concerned the effects of harvest and not the effects of protective measures on aesthetics. Accordingly, this comment appears to be a matter of the "eyes of the beholder."

VI. MANAGEMENT PRACTICES

Summary: Northwest Forestry Association, GBA Forestry (for Washington Hardwoods Commission), and three individuals requested more detailed descriptions of the sequence, timing, and specific quantity of silvicultural activities that will be used to manage state land to produce the harvest levels and maintain the habitats described in the HCP. A member of the Washington State House of Representatives, a Stevens County

Commissioner, and one individual commented that the HCP would place unnecessary restriction on the management of state lands. Point No Point Treaty Council and one individual commented that a simple landscape plan based solely on forest stands available for various silvicultural treatments, while ignoring best management practices and non-timber resources, is not acceptable. An identical letter from 51 individuals requested assurance that sufficient habitat will exist to make up for losses of wildlife that will occur under this plan. One individual commented that active management can improve watershed and wildlife habitat characteristics. USEPA Region 10 noted the proposed riparian management strategies are a departure from the historic one-size fits all approach. Blue Ribbon Coalition requested a definition of stabilize and environmental problems as used in the OESF objective to *stabilize and close access to roads that no longer serve a management function or that cause intractable management or environmental problems*. Blue Ribbon Coalition commented that other activities which are served by roads in our public forests need to be considered.

Response: An HCP is the principle document supporting an application for incidental take permits and unlisted species agreements. The purpose of an HCP is to describe the management practices and/or guidelines to which the applicant willingly commits in exchange for incidental take permits. DNR chose not to present detailed descriptions of silvicultural activities in the HCP because doing so might unduly constrain DNR over the long term. DNR and the Services believe that DNR's HCP describes silvicultural activities at a level of detail sufficient to satisfy Section 10 of the ESA. Silvicultural activities will comply with the Washington Forest Practices Rules and will be consistent with the direction given by Board of Natural Resources as expressed in Forest Resource Plan (DNR 1992b).

The DNR's HCP does not place unncessary restrictions on the management of state lands. The conservation commitments presented in DNR's HCP are only those necessary to obtain incidental take permits and unlisted species agreements.

DNR and the Services agree that landscape plans which ignore nontimber resources are not acceptable. DNR's Landscape Planning process does consider non-timber resources such as fish and wildlife habitat.

The Services' principal motivation for issuing incidental take permits and entering into unlisted species agreements is to obtain assurances that various fish and wildlife habitats will be maintained over the long term.

DNR and the Services acknowledge that for some wildlife species active management can improve habitat characteristics.

In the passage cited from the OESF riparian conservation strategy, "stabilize" means to minimize mass-wasting and surface erosion caused by roads, and "environmental problems" refers mainly to the adverse impacts of roads on water quality and fish habitat. The Services did not require DNR to consider in its draft HCP or draft EIS other activities which roads in forests serve. DNR chose not to consider in its draft HCP these other

activities, such as recreational use of roads, because doing so might unduly constrain DNR over the long term.

A. AMOUNT OF HARVEST

Summary: Comments from Honor the Earth Children's Circle and one individual requested preserving the forests that are left on DNR-managed land. One individual commented that two tables which included higher harvest figures for HCP options were false because they were based on including thinning and pole sale harvests that were excluded from other options. Merrill & Ring requested more information on how harvest levels are arrived at and where they come from, while Bogle & Gates (as a consultant to Washington State University) questioned how harvest levels can be higher under the HCP when more land is deferred from harvest.

Response: See the response for "Old-Growth Habitat" on page 3-13 in this section.

The harvest calculations done to compare the economic consequences of the HCP alternatives used identical silvicultural treatments, including periodic commercial thinning, for all three alternatives. A summary of the methods and results of the harvest calculations are part of the public record and can be obtained from DNR. Under HCP Alternative B, the issuance of an ITP for spotted owls results in a net increase in the amount of forest available for harvest.

B. HARVEST SCHEDULE

Summary: A member of the House of Representatives stated it is important for DNR to demonstrate how planning, such as the creation of multiple landscape planning units, as proposed by the HCP will not interfere with a predictable and stable timber supply and economic return. Bogle & Gates (a consultant to Washington State University) commented that the discussion of the OESF is misleading in that, while the unzoned approach suggests that areas will not be deferred from timber management, portions of the OESF actually contain forests that cannot be harvested under the HCP for the foreseeable future -- in some cases for decades.

Response: As expressed in Forest Resource Plan Policy No. 16 (DNR 1992b), DNR has been directed by the Board of Natural Resources to use landscape planning. Hence, landscape planning is an element of all three HCP alternatives. Planning is generally believed to result in more predictable and stable outcomes.

The mission of the OESF is to develop and test forest management strategies which will optimally integrate commodities production with ecological conservation. DNR and the Board of Natural Resources expect that the trust beneficaries, citizens of Washington state, and forest products industry will benefit greatly from the knowledge acquired through research in the OESF. The management strategy proposed for the OESF in the draft HCP, the unzoned forest, is a working hypothesis. Through adaptive management this initial management strategy will change with each decade. In some landscape planning units, a deferral of timber harvest will be necessary to satisfy the mission of the OESF.

C. HARVEST METHODS

Summary: One individual and the NW Biodiversity Center questioned the use of any clearcutting on state lands. Northwest Forestry Association suggested using language clearly stating areas prone to mass wasting may be harvested in the future when the knowledge to assess site conditions and prescribe suitable harvest methods is developed. NW Timber Workers Resource Council commented on the need to change public perceptions of the real impacts of various logging methods. Two individuals requested a better description of the silvicultural practices that will be used to develop habitat structures and manage state forests in a way that is sustainable over time.

Response: DNR is concerned about the impacts of intensive forest management, in particular, the impacts of repeated clearcut harvest over many rotations. The department has a legal duty to produce long-term income for the trust beneficiaries. A lasting diminution of soil productivity due to intensive forest management would be counter to this duty. There are many unanswered questions surrounding the effect of forest management on soil productivity. To answer some of these questions, DNR is engaged in long-term site productivity research near Sappho on the Olympic Peninsula.

The draft HCP (p. IV.56) does clearly state that areas prone to mass-wasting may be harvested in the future when knowledge to assess site conditions and prescribe suitable harvest methods are developed.

Changing public perceptions is beyond the scope of the proposed action.

An HCP is the principle document supporting an application for incidental take permits and unlisted species agreements. The purpose of an HCP is to describe the management practices and/or guidelines to which the applicant willingly commits in exchange for incidental take permits. DNR chose not to present detailed descriptions of silvicultural practices in the HCP because doing so might unduly constrain DNR over the long term. DNR and the Services believe that DNR's HCP describes silvicultural practices at a level of detail sufficient to satisfy Section 10 of the ESA.

D. YARDING METHODS

Summary: Bogle & Gates (a consultant to Washington State University) requested clarification on whether ground yarding equipment will be allowed in buffers.

Response: Ground yarding equipment may be allowed in buffers. Specific prescriptions regarding activities in the riparian zone that will be applied under the various on-the-ground circumstances will be developed as part of a comprehensive strategy subject to the adaptive management provisions of the HCP. So long as such yarding does not diminish the value of the habitat for salmonids, those yarding activities would be allowed.

E. RIPARIAN MANAGEMENT STRATEGY

Summary: The USEPA Region 10 commented that to protect aquatic resources and fisheries health and to carry out restoration and protection efforts, one must take a

landscape-scale approach. The USDA Natural Resource Conservation Service said that making an RMZ off-limits to management will slow down the recovery of riparian areas. The WDFW stated that, while offering potential benefits for salmonids, DNR's HCP is weak in providing life requisites for other species dependent on riparian habitat.

The Elwha/Clallam Tribe was "particularly pleased with the riparian strategy" as outlined in DNR's draft HCP and further stated "implementation of the riparian strategy will be a significant contribution to recover salmon populations in western Washington." The Muckleshoot Tribe recommended that the "six points of the Riparian Conservation strategy for the OESF" be added to the Riparian Conservation Strategy for the west-side planning units. The NWIFC said, "It is difficult to evaluate what DNR's intentions are for riparian buffers." They also said, "a broader range of habitat protections should be set forth in the HCP, including a higher and lower range. DNR would then commit to maintaining habitat within that range, in light of experience it gains through the adaptive management process." The Squaxin Tribe recommended that the selective harvest area from 25 to 100 feet in the riparian buffer be eliminated. The Tulalip Tribe stated that most culverts are impediments or blockages to fish passage.

Clallam County questioned the riparian strategies as laid out in the draft HCP and suggested the paper "Economic Analysis of Forest Landscape Management Alternatives" by Lippke, Sessions and Carey be used as a guide toward better forest stewardship. Metropolitan King County said that they will benefit from harvest practices that minimize downstream impacts, a major mitigation cost for urbanizing counties. They wanted the HCP to reduce the risk for future federal listings of threatened and endangered species, particularly salmonids that inhabit upland streams. The City of Port Angeles said that forest management should be watershed based. The Port of Port Angeles was concerned about the "...tremendous amount of land set aside for riparian management zones" and said that leaving 100 foot or wider zones along Type 4 and 5 Waters is "...detrimental to good forest management." Bogle & Gates (a consultant to Washington State University) said that it is difficult to asses the impacts of the draft HCP guidelines when so much future research and planning is involved and the results won't be known for some time.

WEC supported the draft HCP's riparian strategy for western Washington. American Rivers said the draft HCP is inadequate for fish protection. The Northwest Ecosystem Alliance suggested that DNR use the FEMAT approach to riparian protection. The Rivers Council of Washington wanted site-specific management. The Washington Native Plant Society encouraged DNR to select Alternative C.

Cascade Hardwood said that a greater than four-fold increase in the amount of land set aside for riparian protection, relative to the present forest practices rules, is inappropriate. Inland Wood Specialties said that wider riparian zones endanger the hardwood industry. Merrill & Ring said that riparian strategies decrease land base and decrease harvest levels. NCASI stated that DNR needs to balance resource protection and timber value when dealing with riparian protection. NCASI called the riparian conservation strategy "a costly option" and "overly conservative in protection." NCASI stated, "There is a law of diminishing returns which needs to be exploited if we are to efficiently protect natural resources and still allow for timber use." Northwest Forestry Association said that the

draft HCP ". . .lays out a riparian strategy which substantially deviates from forest practices regulations and FRP." The Northwest Forestry Association suggested that DNR analyze the Forest Resource Plan and forest practices regulations against the HCP in terms of benefit versus cost. Western Hardwood Association stated that the draft HCP riparian protection has not been proven to be better than the forest practices regulations. The Washington Forest Protection Association commented that Washington Forest Practices Rules provide adequate protection of public resources and suggested that DNR use the Forest Resource Plan for stream protection. Washington Hardwood Commission recommended that DNR use the current forest practices rules because "they haven't hurt anything." Washington Hardwoods Commission urged that DNR consider the commission's analysis of the draft HCP.

A local group said that no-harvest RMZs are bad for habitat recovery. An individual supported the draft HCP with some modification. Another local organization asked for more riparian protection. Two individuals wanted the riparian protection measures wider. An individual wanted the riparian protection increased to FEMAT standards. An individual said that a combination of HCP Alternatives B and C is best, especially with respect to Type 5 Waters. An individual said the no-logging buffer is probably too small. An individual wanted the riparian zones to be wider and preferred no-cut buffers. An individual said that riparian protection strategies should be watershed based.

An individual commented that site-specific needs are a key issue. An individual stated that maximizing tree height in the riparian zones will require growth beyond 100 years and that these larger trees will be needed to stabilize jams and are crucial for long-term success of riparian buffers. He also stated that maximizing conifer tree diameter in riparian zones is vital for quality of salmonid habitat.

Response: Specific comments on riparian buffer width or forest management within riparian buffers are addressed below.

1. Riparian Buffer Widths

Summary: The USEPA Region 10 stated that there needs to be more protection along Type 5 Waters. WDFW commented that riparian ecosystems will receive less protection in steep slopes when slope distances are used to measure RMZ widths. Clallam County said there is no biological justification for buffering Type 4 and 5 Waters. The City of Port Angeles said that wide buffers on Type 4 Waters are "detrimental to good forest management."

The Sierra Club and The Rivers Council of Washington commented that riparian zones need to be wider and do not go far enough to address wildlife needs.

The Hoh Indian Tribe requested that horizontal distance be used to measure RMZ widths because on steep slopes large woody debris can be recruited from distances beyond one tree height. The Tulalip Tribes requested that horizontal distance be used to measure RMZ widths because most literature pertaining to riparian function is based on research which has measured horizontally from the stream. The Muckleshoot Indian Tribe suggested that buffers on Type 4 Waters be based on their

sufficient to create properly functioning riparian ecosystems. For example, WDW (1991) recommended riparian buffers 200 feet wide, and FEMAT (1993) specified that riparian buffers be 300 feet wide on fish-bearing streams.

With respect to the Washington Hardwoods Commission's comparison, the Services note that state regulations provide no regulatory relief from the ESA. The Elliott State Forest HCP was for owls and murrelets only and did not address riparian or aquatic species. Plum Creek's HCP addressed over 285 vertebrate species, and DNR's HCP addresses all species.

The riparian strategy of DNR's draft HCP is similar to that described in the Plum Creek Timber Company HCP. DNR specifies a 25 foot no-harvest area. Plum Creek specifies a 30 foot no-harvest area. On Type 1, 2, and 3 Waters, DNR's riparian buffers should average 150 feet. Plum Creek's riparian buffers on Type 1, 2, and 3 streams are 200 feet. Both DNR and Plum Creek allow management activities to occur in the buffer, excluding the no-harvest area. DNR adds a wind buffer (either 100 feet or 50 feet wide) to the riparian buffer in areas that are prone to windthrow. In most instances, the wind buffer would only be added to the windward side of the stream. The total width of riparian buffer along Types 1, 2, and 3 streams is less under DNR's draft HCP than under Plum Creek's HCP. DNR's total width equals 400 feet (150 feet + 150 feet +100 feet) along Type 1 and 2 streams, and 350 feet (150 feet + 150 feet + 50 feet) along Type 3 streams. Plum Creek's total width is 400 feet along Type 1, 2, and 3 streams (200 feet + 200 feet). Along Type 4 streams, both HCPs specify a 100 foot riparian buffer, and both HCPs allow management activities within the buffer.

DNR agrees with the observation that on very steep slopes large woody debris can be recruited from distances beyond one tree height. The draft HCP has been modified so that riparian buffer widths are measured horizontally. This modification will also adjust the buffer width for topography, and the riparian buffer width will always comply with minimum buffer widths required by state forest practices rules.

DNR agrees that the riparian buffer could be greatly reduced, and possibly destroyed, in a flood. This could occur mainly through stream bank erosion and lateral channel migration. The HCP will be modified so that the riparian buffer is measured from the edge of the 100-year flood plain instead of the active channel margin.

The justification for using site-potential height of a mature conifer stand (age approximately 100 years) rather than the site-potential height of an old-growth stand (age approximately 200 years) for the width of the riparian buffer is presented in the draft HCP (p. III.63, and p. IV.59 to IV.61). The reasons for 100 foot buffers on Type 4 Waters are explained in the draft HCP (p. IV.59-IV.61).

The issue of adequate riparian buffer widths for deep-forest species of wildlife is addressed under the heading of forest fragmentation.

2. Riparian Buffer Treatment

Summary: The USEPA (Region 10) asked for an explicit definition of physical habitat targets or performance standards related to "low harvest" or "minimal harvest" areas. The USDA Resource Conservation Service said DNR should manage the forest "right to the stream bank." This includes planting, topping, or removing risk trees up to the stream bank. The WDFW asked for proof that single and multiple tree harvest in the buffers would not compromise riparian ecosystem functions, especially short-term and long-term large woody debris recruitment.

The NWIFC commented that DNR should use the wild salmonid policy or Priority Habitat and Species Management Recommendations (WDW, 1991) as habitat standards. The NWIFC said that prescriptions are vague and need to address restoration. Also, they said that DNR needs to put limits on single tree removal. The Point No Point Treaty Council also requested that measurable criteria, or habitat standards, for biological success, both terrestrial and instream, be included in the HCP. The Hoh Indian Tribe suggested that a certain minimum number of trees be contained within an RMZ to make it functional, so that slope distance or site condition irregularities do not reduce large woody debris recruitment below what could actually be attainable. The Muckleshoot Indian Tribe stated the HCP is unclear regarding how DNR will determine whether minimal harvest activities are appreciably reducing stream shading, etc. The Point No Point Treaty Council, Tulalip Tribes, and Squaxin Indian Tribe recommended that the inner 100 feet of the riparian buffer be a no-harvest zone and commented this would insure that large woody debris recruitment needs are met. The Squaxin Indian Tribe said standards would allow the last big trees to be removed from riparian ecosystems. The Tulalip Tribe says that the buffer treatments are not well defined.

Bogle & Gates (a consultant to Washington State University) requested that the HCP's riparian buffers be compared to forest practices rules, i.e., the regulatory minimums, and to buffer prescriptions that have been developed in recent watershed analyses. This consultant said that standards for buffers are impossible to meet, the amount of allowable harvest is unclear.

The Sierra Club wanted wider no-cut zones. The Rivers Council of Washington wanted a wider no-cut zone in RMZs and wider RMZs overall. The Northwest Ecosystem Alliance wanted no-harvest buffers and more information on buffer treatments. American Rivers wanted to wider buffers with no harvest. The National Audubon Society preferred DNR's Alternative C.

The Northwest Forestry Association asked what level of harvest will be allowed in buffers and which species can be removed. NCASI stated the management which occurs and the silvicultural objectives are equally important as the width of the buffer. The Washington Forest Protection Association commented that there are inconsistencies in what kind of tree removal will be allowed and what kind of restoration of conifers will take place in the RMZs. The Cascade Hardwood Association wanted more tree removal in RMZs and funding for stream restoration. The Washington Hardwoods Commission asked that DNR allow entry into buffers

for harvest and reclamation. The Western Hardwoods Association said that conversion of buffers from hardwood to conifer is preferential toward one species group. Also, they said that increased buffer widths and the addition of wind buffers have not proven to be any more effective for fish than the current rules in the Forest Practices Rules and Regulations. The Western Hardwoods Association said that there is a need to allow selective harvest in buffers. Inland Wood Specialties believed that the riparian zone management should include harvest and reclamation, and that this would enhance water quality and fish and wildlife. Merrill & Ring Logging Company said that blow down will increase with partial cutting of RMZs. GBA Forestry expressed the hope that the DNR technical staff will lead the way in demonstrating forest practices that provide adequate habitat while maintaining productivity of the forest for other uses. A small forestry group said that they need to be able to manage to stream for rehabilitation.

The local chapter of the Society for Conservation Biology wanted the no-harvest zone increased to 50 feet and said that if only one side of stream could be harvested at a time, then potential "edge effects" (both physical and biological) would be greatly reduced. A local environmental group wanted no harvest in buffers and no roads. An individual said that we need all foresters "to work right to the stream" to avoid blowdown damage that comes from downed trees and resulting stream sedimentation. Another individual said that if it is allowable to leave a 25-foot buffer, then allow foresters to take some of the leave trees to get revenue from them, since this would keep them from falling into the streams and plugging up the streams and causing further problems. An individual offered information on forest management in riparian buffers.

Several individuals said that the term "buffer" had been flagrantly misused in the draft HCP. They believed that "buffer" is synonymous with "preserve." These individuals and several others wanted no-harvest buffers and no entry into buffers. Two individuals commented vehicles should stay out of riparian zones, because stream temperature and sediment load are compromised. An individual wanted the no-cut buffers clearly defined. Many individuals (51) wanted snags, logs, and no roads in RMZs. An individual said that the provisions for riparian buffers allow logging over 175 feet of the 200-foot buffer and that this is not a wise provision. An individual wanted the no-harvest zone extended to 50 feet. A local group commented that heavy equipment and clearcutting are not desirable because they cause blowdown and risk trees can cause siltation due to the huge root balls that are exposed.

Response: DNR did consider "no-harvest" and "no-entry" riparian buffers for its HCP. DNR determined that an HCP which specified less forest management in riparian ecosystems than that specified in the draft HCP would not satisfy one of the main purposes of the proposed action -- to produce the most substantial support possible over the long term for the trusts. It is thought the riparian strategy in the draft HCP satisfies this purpose and is sufficient to satisfy Section 10 of the ESA. Futhermore, as explained in the DEIS, the overall riparian conservation strategy of the proposed HCP should provide better protection of salmonid habitat and other aquatic resources than Alternative A.

The decision to allow forest management activities in the riparian buffer was based on a common sense assumption. It is assumed that for a healthy riparian ecosystem there exists some threshold of timber harvest below which salmonid habitat will not be degraded. Clearly, if only one tree, even one exceptionally large tree, were harvested from a healthy riparian ecosystem, there would be no measurable adverse impact to the salmon inhabiting that ecosystem. DNR anticipates that through monitoring and adaptive management this threshold will be discovered and methods for determining site-specific thresholds can be developed. DNR believes, based on this common sense assumption, that the standard for forest management in the riparian buffer, "maintain or restore the quality of salmonid habitat, is not impossible to meet.

It is difficult and expensive to assess the impacts of resource management plans with the scope and scale of DNR's HCP. For this reason, DNR chose to assess the impacts and outcomes of Alternative A, which is DNR's best characterization of its current management, and two other alternatives, B and C, which capture the range of reasonable management scenarios for the HCP. The regulatory minimums of the Washington Forest Practices Rules are not a reasonable alternative. The regulatory minumums are inconsistent with the direction given to DNR by the Board of Natural Resources through the Forest Resource Plan. Also, early in the development of DNR's draft HCP, the Services conveyed to DNR their belief that current Washington Forest Practrices Rules would not satisfy the Section 10 criteria. Washington Forest Practices Rules Watershed Analysis was also eliminated as a resaonable alternative for the HCP. Watershed Analysis is inadequate for the HCP because it does not yet have a wildlife module, and it is considered impractical, at least over the short term, because of the long time period necessary to complete the analysis of all DNR-managed lands in the five west-side planning units.

Hardwoods will always be a component of DNR-managed forests, particularly in riparian ecosystems where continual natural disturbance creates environmental conditions conducive to the establishment of hardwoods. However, DNR intends to manage riparian ecosystems to achieve a more natural mix of hardwood and conifer species.

Buffer is defined in Webster's New World Dictionary (1976) as "any person or thing that serves to lessen the shock or prevent sharp impact between antagonistic forces." The glossary of the draft HCP defines buffer as "a forested strip left during timber harvest to conserve sensitive ecosystems or wildlife habitat." DNR's intention to conduct management activities in the riparian buffer is consistent with these definitions.

There may be situations where managing forest "right to the stream" is appropriate and even beneficial to salmon habitat, but given the current state of freshwater salmon habitat in western Washington, the risks of managing "right to the stream" outweigh the benefits. DNR is permitted to conduct restoration activities in the no-harvest area of the riparian buffer, but such activities will be the exception rather than

the rule. Over the long term, the riparian strategy should result in the natural recovery of most, if not all, riparian ecosystems on DNR-managed land.

DNR has chosen not to specify performance standards or habitat standards for the management of riparian areas. DNR's objective is to manage riparian ecosystems so that important elements of salmonid habitat (large woody debris, sediments, detrital nutrients, and shade) are within the natural range of variability for functional habitat; in other words, they are properly functioning riparian habitats. For some habitat elements, in particular large woody debris and detrital nutrients, the natural range of variability or the minimum requirements for functional salmonid habitat are poorly understood. DNR anticipates that through monitoring and adaptive management our understanding will evolve to the point where scientifically credible performance standards can be specified.

The draft HCP provides a general description of the forest management allowed in the riparian buffers in Chapter IV, p. IV.54 through 56 and p. 62 and 63.

In theory, harvesting just one side of a stream at a time would reduce potential "edge effects." And if streams were sparsely distributed across the landscape, then this would be a practical management prescription. However, in western Washington it is often the case that a stream, or several streams, flow through a single management unit, so in reality such a prescription is highly impractical.

As part of road network management DNR will develop a comprehensive landscape-based road network management process that will specify conservation objectives that minimize adverse impacts to salmonid habitat. The issue of minimizing vehicles in riparian zones would be addressed in the comprehensive landscape-based road network management process (draft HCP p. IV.56). DNR will avoid constructing roads in riparian ecosystems to the maximum extent practicable, but road stream crossings in some situations are unavoidable.

3. Wind Buffer

Summary: Clallam County said that the wind buffers need to have an economic analysis. The Hoh Indian Tribe commented that adding an exterior wind buffer to either side of the stream along the interior buffer on the Hoh River mainstems or side-channels may still be inferior to short-term measures already required along the Hoh River. The Muckleshoot Indian Tribe said that there needs to be a method for determining on a site-specific basis the harvest activity in the wind buffer. The Point No Point Treaty Council said that they support DNR's Alternative C and want to be involved in developing the wind buffer guidelines. The Tulalip Indian Tribe stated that they cannot evaluate the effectiveness of DNR's wind buffers because no specific method is proposed in the draft HCP.

Bogle & Gates (a consultant to Washington State University) said that the Draft EIS does not support its conclusions about wind buffers. They point out that after a lengthy discussion of scientific studies of windthrow, the Draft EIS summarizes several studies as finding little or no correlation between riparian buffer width and

amount of windthrow. The consultant also said that there are inconsistencies regarding when a wind buffer will be applied and that the standard for requiring wind buffers as set forth is unclear. The Northwest Forestry Association asked what is the legal liability for wind buffers? The Northwest Forestry Association said that wind buffers do have a place in a land managers "tool kit" but suggested that in some places it makes sense to have zero wind buffer.

The Sierra Club and The Rivers Council of Washington said that to be effective and to avoid blowdown, the percentage of trees to be removed in wind buffers should be limited. Merrill & Ring and Mt. Baker Plywood said the proposed wind buffers are excessive. Merrill & Ring said that wider buffers would cause more timber to blow down as management occurs on the adjacent stands. Washington Hardwoods Commission said there is not enough science to prove a need for wind buffers. An individual said that windthrow is occurring because of current buffer zones. An individual said that wind buffers are crucial to success of RMZs.

Response: A number of reviewers have referred to the interior riparian buffers and/or exterior wind buffers proposed in the HCP and OESF plans as "no-entry" or "no-harvest" buffers. As clearly stated in the draft HCP and DEIS, interior and wind buffers are part of the managed forest, where partial or selective harvest is permitted in both types of buffers, except within the first 25 feet on either side of streams in the five west-side planning units outside the OESF. The 25-foot, no-harvest buffer was established primarily to protect the stability of streambanks, and no harvest would occur other than that necessary for ecosystem-restoration activities. Otherwise, some level of commercial harvest will occur within riparian management zones (including the interior and wind buffers) on state lands covered by the HCP and OESF plans. For example, 33 percent removal of trees by volume is permitted (in addition to pre-commercial thinning) from the wind buffers on the OESF during any given rotation. Several harvest-impact and/or economic analyses prepared by non-DNR sources (e.g., Marshall and Associates, Inc. et al., 1996) assume "no-harvest" scenarios, which are not consistent with the strategies stated in the draft HCP. For further clarification, see discussions on p. IV.54 through 56 and IV.97 through 106 in the draft HCP.

Several reviewers stated that economic analyses of the wind-buffer strategies should be performed. DNR included statistical analyses of these strategies in its overall economic analysis of the HCP and OESF plans. Hence, the economic analyses presented to the Board of Natural Resources include the economic and harvest-level consequences of imposing wind buffers on all state lands covered by the draft HCP. These economic analyses are part of the public record.

Several reviewers stated that there is little evidence that forest-practices rules, instated in [1992], are not working and that the proposed strategies in the draft HCP are excessive. DNR contends that it has sufficient evidence from portions of state lands in western Washington, particularly on the western Olympic Peninsula, to indicate a need to manipulate riparian-buffer configurations in order to make them more windfirm. DNR has lost a sufficient number of riparian buffers, in whole or in

part, from blowdown during the past decade that it cannot ignore the problem. Blowdown has resulted in measureable bank erosion (i.e., substantial input of sediment to streams) and loss of stream shade and has, in more inaccessible areas, incurred economic loss because salvage has been operationally difficult. Therefore, DNR recognizes blowdown as a critical issue and one that must be addressed as part of a 100-year management plan.

In addition, few systematic studies (with the exception of one currently being conducted by DNR's Forest Practices Division) have been conducted that evaluate the physical or biological integrity of riparian buffers established since 1992 in western Washington. One hypothesis currently being tested in DNR's study is whether 4 years (1992-1996) is long enough to witness substantial alteration of riparian buffers due to wind, given that blowdown often occurs incrementally over a number of years as the outer margins of a buffer are disturbed during winter storms. A number of studies conducted in other regions of the Pacific Northwest (e.g., COPE studies in Oregon) are not directly applicable because they deal with different forest types, soil and geologic characteristics, meteorological conditions, and other site-specific factors. Hence, DNR believes that "little evidence" does not necessarily equal "no problem" in western Washington.

Consequently, DNR has decided to rely on the information it has from years of management experience and to judiciously apply wind protection where field evidence suggests there might be a risk of blowdown with the potential for altering bank stability, shade availability, long-term recruitment of large woody debris, and other critical riparian functions. Wind buffers on the OESF are intended to be laboratories for testing how best to make riparian stands windfirm, and results from replicated experiments of stand manipulation are expected to provide some guidance for managing riparian buffers on other state lands covered by the draft HCP. Wind-buffer experiments will include everything from total harvest (no wind buffer) to partial harvest to no harvest, in a variety of configurations designed to meet site-specific requirements for maintaining the structural integrity of interior riparian buffers. The number of trees removed at any given site will depend on the capability of the remaining stand to withstand blowdown.

With reference to concerns regarding the mainstem Hoh River, the draft HCP does not supplant the Shoreline Management Act, chapter 90.58 RCW, or the regulatory authority of the Washington Department of Ecology and Jefferson County in enforcing regulations within areas designated as shorelines of the state. Similarly, other Shoreline Management Areas will continue to be regulated by Washington DOE and the appropriate local governmental authority. In addition, the HCP must adhere to other state regulations. Hence, management strategies applied under the HCP must meet or exceed the level of resource protection afforded by current rules and regulations.

With reference to the draft HCP's Alternative C, presented in the DEIS, it was the decision of the Board of Natural Resources to select HCP Alternative B. This choice was based on their assessment of the alternative most likely to meet the fiduciary

obligations of the trust while providing adequate protection of aquatic and riparian system functions.

Harvest activities within wind buffers will take into account site-specific factors, including local topography, meteorological characteristics, riparian-stand composition and structure, age and structure of adjacent upland stands, and physical site conditions. Field procedures for carrying out such analyses will be described in the HCP implementation guidelines for the five west-side planning units outside the OESF. Experimental protocol for wind buffers on the OESF will be described in the OESF implementation guidelines. Hence, in response to the concern that wind-buffer strategies are poorly defined (the original comment states, "... they [DNR] propose no specific method that we are able to evaluate"), specific methods are not addressed in the draft HCP or DEIS but will be detailed in the implementation guidelines. By state legislative mandate, DNR cannot develop these implementation guidelines until the HCP is approved by the Services and the Board of Natural Resources.

A number of reviewers stated that the percent of trees removed from wind buffers should be limited in order to enhance the effectiveness of those buffers. Given the relative lack of data regarding how many trees should be removed and the variability of site conditions over 1.6 million acres of state lands, DNR must test a number of management hypotheses to determine the most effective strategy for each riparian setting. The needs for extensive wind buffers might be less in some areas (e.g., narrow valley bottoms in areas of high topographic relief) than others (e.g., low-gradient, wide valley bottoms in coastal regions). Hence, the configuration and tree density of wind buffers must be tailored to fit specific site conditions, in order for them to be effective in the long term. These questions cannot be answered with current information. Consequently, DNR has proposed to conduct a systematic research program on wind-buffer strategies, in order to gain some answers and certainty that management practices are effectively treating windthrow problems.

As stated in the preceding paragraphs, DNR has obtained sufficient evidence from managing riparian buffers over the past decade to indicate that windthrow is an important management concern on portions of state lands in western Washington.

The purpose of the literature review in the DEIS is was to indicate how little is known about windthrow behavior, particularly in western Washington where very few rigorous studies have been conducted, and to support the need for gaining better scientific and management understanding of this phenomenon. There are several interpretations that one might make regarding the value of current literature. One is that the current literature shows few relationships between buffer width and windthrow potential and, therefore, that no windthrow problem exists. The other is that there have been too few published studies relevant to site conditions on state lands in western Washington to prove or disprove the existence of a windthrow problem. The draft HCP was developed on the latter interpretation and on the observations of DNR foresters, managers, and scientists that indicate measureable windthrow problems in riparian buffers on state lands. Until effective management strategies are developed, DNR will continue to establish riparian buffers, a number of

which are susceptible to blowdown, and face uncertainty with regard to just how wide buffers should be to maintain windfirm trees.

There are no recipes available for establishing buffers to meet every site condition effectively. In the face of little information on appropriate buffer widths and a real management problem, DNR has proposed to move forward proactively with the support of other local land managers who feel that they will benefit from new information shared by DNR (as per written and oral testimony received by DNR). The research program moves DNR into the arena of experimentation and adaptive management, in order to achieve more long-term certainty. This is a trade-off between short-term uncertainty, which already exists irrespective of the buffer strategy applied (i.e., via forest-practices rules, Forest Resource Plan), and long-term certainty in the economic and ecologic soundness of management and conservation practices.

As stated in the draft HCP, the terms "moderate potential" for windthrow and "no evidence" of windthrow potential, used in the strategy for the five west-side planning units outside the OESF, will be defined operationally in the HCP implementation guidelines. Standards for designating wind buffers (i.e., when, where, and how) outside the OESF will also be detailed in the HCP implementation guidelines. The procedure for developing experimental protocols has been summarized on p. IV.114 through 120 of the draft HCP. Specific directions for choosing experimental designs and applying them to given riparian areas will be discussed in the OESF implementation guidelines.

The values of 1 percent or 10,000 acres were presented as rough estimates of wind-buffer extent in the five west-side planning units outside the OESF in order to broadly illustrate what the landscape potentially might look like under the draft HCP. These numbers are estimates only (i.e., rounded to the nearest 1000 acres) and were not derived from a comprehensive analysis of actual, on-the-ground placement of wind buffers. The actual number of acres placed in wind buffers may be smaller or larger than 10,000 acres. Hence, these values should not be interpreted as a standard to which DNR is contractually bound.

4. Wetland Buffers

Summary: WDFW wants more discussion of importance of wetland buffers for wildlife. The Muckleshoot Indian Tribe said that the draft HCP indicates that management in and around wetlands will be consistent with DNR Policy No. 21 without offering any process as to how this will be determined. They said the procedures for restoration are unclear and wanted to know who decides if restoration has been achieved. The Point No Point Treaty Council supported DNR's Alternative C and suggested that to achieve no net loss of functional wetland, a larger area should be required for mitigation if wetlands are destroyed. Bogle & Gates (a consultant to Washington State University) said that there is a need to know the current amount of wetlands in order to determine no net loss of wetlands.

The Rivers Council of Washington commented that DNR's draft HCP does not differ from the Forest Practices Regulations. The Sierra Club commented that DNR's HCP is no different than current practices. To adequately protect plants and wildlife, the Northwest Ecosystem Alliance, Washington Wilderness Council, WEC, and Washington Native Plant Society recommended Alternative C. Northwest Forestry Association commented there is a need for more information: (1) How much wetland acreage is involved by region? (2) What will be the economic effect of protecting wetlands? (3) What will be the operational effect? And (4) Will it affect road construction, use, and maintenance? A forestry company said that the wetlands protection provision will take thousands of acres of timberland out of production.

The local chapter of the Society for Conservation Biology recommended a 50 foot no-harvest zone surrounding all wetlands greater than 0.25 acre. Two local environmental groups preferred Alternative C. Another local environmental group wanted more protection. Many individuals stated DNR should select Alternative C. An individual did not think DNR's draft HCP goes far enough to protect the "...small bogs and ponds of the forest". An individual recommended no-logging buffers. An individual suggested that the acreage for wetland mitigation should be 3:1. An individual said that buffers and small bog should be no-cut. An individual said that DNR's Alternative A is adequate if roads are controlled.

Response: DNR did consider wider wetland buffers and "no-harvest" wetland buffers for its HCP. It was determined that an HCP which specified more protection of wetlands than that specified in the draft HCP would not satisfy one of the main purposes of the proposed action -- to produce the most substantial support possible over the long term for the trusts. It is thought the wetland strategy in the draft HCP satisfies this purpose and is sufficient to satisfy Section 10 of the ESA.

The wetlands management in DNR's HCP provides more protection than the Forest Practices Regulations and it is not quite DNR's current practice. DNR's Forest Resource Plan Policy No. 21 says, "The department will allow no overall net loss of naturally occurring wetland acreage of function." This standard surpasses the level of protection provided by the forest practices rules.

The Forest Resource Plan was approved in 1992, but it has yet to be fully implemented. The prescriptions described in the draft HCP (p. IV.57 and 58) are not DNR's current practices but are characterized as "no action" because they implement the direction given by the Forest Resource Plan.

For all commitments made in the HCP, such as the restoration of wetland drainage or equal acreage mitigation for damage to wetlands, USFWS and NMFS, or their designee, will decide whether or not restoration or adequate mitigation has been achieved.

The operational and economic effects of the wetland strategy are the same for Alternatives A and B. The wetland acreage on DNR-managed lands is not accurately known, but is estimated to be approximately 10,500 acres, or 0.6 percent of the entire

HCP planning area. One does not need to know the current amount of wetlands in order to determine no net loss. The "no net loss" policy can be adhered to on a site-by-site basis.

5. Watershed Analysis Prescriptions

Summary: USEPA Region 10 said that there needs to be more discussion concerning use of Washington's Watershed Analysis process as it relates to Total Maximum Daily Load (TMDL) requirements. The NWIFC said DNR's HCP does not account for cumulative effects. The Point No Point Treaty Council supported the OESF 12-Step watershed assessment procedure. The Northwest Forestry Association commented that the OESF watershed assessment procedure may add needless planning complexities and may lead to unwanted legal actions if the process is not followed to the letter. The Washington Forest Protection Association and an individual pointed out that there is an error in the DEIS on page 4-267 about the new riparian function module in the watershed analysis manual. (The Draft EIS said that the latest version of the watershed analysis manual increases the minimum debris recruitment distances in western Washington from 66 to 100 feet. Actually, this version utilizes a 100 foot assessment width to determine large woody debris potential.) The Washington Forest Protection Association also claimed that Forest Practices Rules - Watershed Analysis provided adequate protection of riparian ecosystems because it assesses components such as large woody debris and stream shading. Another individual said that the OESF strategy ignores watershed analysis.

Response: Conducting watershed analysis as an HCP alternative was considered impractical because of the long time period necessary to analyze the many Watershed Administrative Units (WAUs) that contain DNR-managed lands in the west-side planning units. Consequently, following the formal watershed-analysis process was eliminated from the list of reasonable HCP alternatives.

DNR recognizes that there are a number of advantages to applying many of the watershed-assessment methods described in Version 3.0 of the Washington Forest Practice Board manual (WFPB, 1995b) in order to meet the needs for evaluating physical and biological conditions under the draft HCP. For example, these methods generally are accepted by most entities as the standard for credible analytical work, and they have been peer-reviewed and tested over the course of several years. The draft HCP, however, goes beyond the scientific issues addressed in the current Board manual by treating wildlife species other than salmonids, species habitat other than fish habitat, and components of the riparian ecosystem other than water temperature and large-woody-debris recruitment. The Board manual can provide a foundation for some physical and biological assessments within areas covered by the draft HCP; that foundation must be expanded and modified to incorporate other resource-protection and land-management issues. Conducting watershed analyses per the Forest Practices Act is the prerogative of the landowner and, as such, DNR has decided to integrate watershed-analysis methods, where appropriate, with other management tools including landscape planning and harvest planning. DNR will continue to participate in formal watershed analyses and will sponsor landscape-planning efforts on large blocks of state-land ownership (as per FRP DNR 1992b Policy 16). The

procedures for landscape planning under the Forest Resource Plan currently being developed by DNR, contain elements of the watershed-analysis methods and procedures. Where watershed analyses are conducted on lands covered by the draft HCP, prescriptions resulting from the assessments will be applied unless HCP requirements meet or exceed the level of protection afforded by the prescriptions (as per alternate-prescriptions clause, WAC 222-22-070(2)). See the draft HCP, p. IV.51 for further discussion.

The Washington DOE and DNR Forest Practices Division currently are working together to determine the relationship between the Forest Practices Board watershed-analysis process and TMDL development. As of the draft HCP writing, no formal agreements had been reached, and no procedures or methods for analysis had been made available for consideration by the HCP team. The Washington DOE and DNR Forest Practices Division are the appropriate entities for developing a relationship between TMDL regulation and watershed-analysis prescriptions.

A concern was raised that the OESF Riparian Conservation Strategy does not mention the Washington Forest Practices Board watershed-analysis process (WFPB, 1995b). The discussion of watershed assessments, beginning on page IV.115 of the draft HCP, will be edited to reflect that the results of forest-practices watershed analysis will be employed wherever they are available. It would not be necessary to duplicate assessments of physical and biological conditions via the 12-step method developed for the OESF, although some additional assessment work might be conducted to address issues not covered by the state's watershed-analysis process.

Although the draft HCP and DEIS for the five west-side planning units outside the OESF do not explicitly address the issue of cumulative effects in a specific chapter section, this issue is dealt with implicitly in the DEIS. Inasmuch as the Washington Forest Practices Board watershed-analysis process (WFPB, 1995b) deals with cumulative effects, the draft HCP also addresses cumulative-effects processes by treating mass wasting, surface and road erosion, hydrologic change, riparian functions, physical channel conditions, fish habitat, and water quality and quantity (the same issues addressed in the eight modules of the Board manual). The draft HCP also stresses the importance of on-the-ground adjustment of riparian management zones to appropriately protect key physical and biological functions. This will require integration or synthesis of field information on physical and biological conditions, in order to meet the stated objectives of the riparian-conservation strategy. Details of the field-assessment process and buffer designation will be given in the HCP implementation guidelines. Where watershed analyses or landscape-planning efforts are conducted, the watershed-analysis procedures for cumulative-effects assessment, or similar methods, will be applied.

Comments regarding an error in a reference to the riparian-function module are correct. The sentence on page 4-267 of the DEIS should state: "This version [of the Board manual] potentially strengthens protection for coarse-woody-debris and shade sources by increasing the minimum assessment-zone widths for debris recruitment distances in western Washington from 66 to 100 feet. Therefore, observed depletions

in long-term sources of woody debris within 100 feet of the channel margin might require additional prescriptions for protecting wood *sources*." (See Section 2, changes to the DEIS, of the FEIS.)

A comment was made that current forest-practices rules provide adequate protection of riparian ecosystems because they assess large-woody-debris recruitment and stream shade. Whereas the current forest-practices rules might be adequate in many instances to protect a substantial percentage of large woody debris and shade availability, they do not address other aspects of riparian systems known to be important in maintaining habitat for riparian obligate species (i.e., salmonids as well as other mammals, reptiles, amphibians, and plants). As described in the DEIS, these include detrital (nutrient) input, sediment input (as affected by windthrow and other riparian disturbances), microclimate, and reduction in riparian-buffer functions due to windthrow activity. This is a multi-species plan, whereas the forest practices rules pertaining to riparian management zones deal exclusively with fish habitat. In addition, DNR currently leaves considerably wider buffers than the forest practices minimums, on average, (discussed on p. 4-152 of the DEIS) because present physical and biological conditions demonstrate the need for additional protection. Regardless of whether the HCP is adopted, DNR likely will not revert to smaller buffers where evidence indicates the need for wider riparian management zones than specified in the forest practices rules.

F. RESERVES/REFUGIA

Summary: Bogle & Gates (a consultant to Washington State University), and two individuals questioned the need for increasing permanent habitat deferrals for expanded riparian buffers, wetland buffers, wind buffers, special habitat buffers and special species management plans. Black Hills Audubon Society and one individual requested remaining old growth be protected as refugia. One individual asked that no-logging buffers and habitat reserves be clearly defined so they can be identified by anyone.

Response: See the response for "Old-Growth Forest". Buffers and forest set-asides or deferrals will be clearly defined as the HCP is implemented or when management units are prepared for timber sales.

G. HERBICIDES

Summary: The Muckleshoot Indian Tribe stated it is unclear what size buffers will be established for areas that will be sprayed with herbicides, using ground and aerial applications. Cascade Hardwood and the Point No Point Treaty Council requested that the value of non-coniferous species be recognized and that herbicide applications be reduced or eliminated. One individual requested that DNR increase its use of aerial herbicide applications as an effective vegetation management technique.

Response: Herbicide use will comply with the Washington Forest Practices Rules and will be consistent with the direction given by Board of Natural Resources as expressed in Forest Resource Plan Policy No. 33, "Control of Competing Vegetation" (DNR 1992b). Also, see page IV.178 in the draft HCP.

H. REPLANTING

Summary: Northwest Forestry Association stated that the site preparation discussion is grossly inadequate and should include estimates of productivity loss and the effect on site preparation of the new land management regimes.

Response: See response for "Management Practices."

I. GROWTH & FERTILIZATION (in section 3.3 only)

J. THINNING

Summary: Northwest Forestry Association commented that DNR would be wise to carefully assess how much thinning can be done without producing negative results in light of compaction from multiple entries and exacerbated disease problems in western hemlock.

Response: Comment noted.

K. SALVAGE

Summary: WDFW commented that salvage of blowdown needs to be conducted in such a way that it does not perpetuate additional blowdown, that live trees need to be left in blowdown areas, and that some large down logs should be retained to provide habitat.

Response: Comment noted. See responses for "Forest Health" and "Wind Buffers."

L. RESTORATION/RECLAMATION

Summary: Comments from the Forks office of the NWIFC, Point No Point Treaty Council, and Northwest Biodiversity Center call for maintaining existing mature and old-growth stands while evaluating where, how, and when riparian zones will need to be restored to conifer or a conifer/hardwood mix. Northwest Forestry Association felt the OESF restoration discussion presents a false picture of a sea of stumps and wasted streams completely devoid of fish and wildlife. Cascades Hardwoods suggested controlled, environmentally friendly hardwood removals to fund restoration activities, while GBA Forestry, Inc. (for Washington Hardwoods Commission) stated that techniques for removing hardwoods to establish conifers are problematic in terms of economics, logistics, and operations.

Response: Comments noted. See responses for "Old-Growth Forest" and "Riparian Buffer Treatment."

M. ROAD MANAGEMENT

Summary: USEPA Region 10, NWIFC, Bogle & Gates (a consultant to Washington State University), Black Hills Audubon Society, and one individual commented on the need for a more detailed description and time line for the proposed comprehensive road network management plan and how it will deal with road densities, roadless areas, road

maintenance, and associated forest management activities. Bogle & Gates requested information on the cost of developing a comprehensive road network management plan and clarification on what restrictions would be placed on harvesting by the lack of a road plan. Washington Forest Protection Association and Bogle & Gates question how an environmental assessment can be done on the impacts of a road plan that does not exist. Point No Point Treaty Council, The Tulalip Tribes, Northwest Ecosystem Alliance, and Northwest Biodiversity Center commented on the lack of discussion on the changes to basin hydrology as the result of road networks. NWIFC, The Mountaineers, 51 individuals (using an identical form letter) and one other individual commented on limiting or eliminating roads in wetlands or areas with high mass wasting potentials. WEC and one individual recommended larger areas of mitigation than the one-to-one replacement of wetland areas disturbed by road construction. The Rivers Council of Washington, Sierra Club, and The Wildlife Society stated a net reduction in roads is necessary. Yakama Indian Nation commented on the HCP's failure to address the impacts of roads on salmonids in eastern Washington.

Response: An HCP is the principle document supporting an application for incidental take permits and unlisted species agreements. The purpose of an HCP is to describe the management practices and/or guidelines to which the applicant willingly commits in exchange for incidental take permits. DNR chose not to present detailed descriptions of road management in the HCP because doing so might unduly constrain DNR over the long term. DNR and the Services believe that DNR's HCP describes road management at a level of detail sufficient to satisfy Section 10 of the ESA.

The impacts of road management under the proposed HCP (Alternative B) are expected to be less than those under No Action (Alternative A). The effects of road networks on basin hydrology are briefly discussed on pages 4-171 to 4-172 of the draft EIS for the HCP. A brief qualitative assessment of the impacts of roads on basin hydrology for each of the alternatives appears on pages 4-173 through 4-175. Road management will comply with the Washington Forest Practices Rules and will be consistent with the direction given by Board of Natural Resources as expressed in Forest Resource Plan (DNR 1992b).

The draft HCP does limit or eliminate roads from wetlands (p. IV.58) and from hillslopes with a high risk of mass wasting (p. IV.56)

In order to reduce certain environmental impacts, DNR and other land managers have reduced the size of forest management units. The main reason for the reduction in unit size is to decrease the size of clearcuts. A consequence of this action is an increase in the amount of roads necessary to access the smaller management units. Conequently, under all three HCP alternatives there will be a net increase in roads. DNR will minimize the adverse environmental impacts of roads by managing the road network for a net decrease in active roads.

DNR's HCP riparian conservation strategy, which includes commitments for road network management, does not cover DNR-managed lands east of the Cascade crest.

1. Construction and Maintenance Standards

Summary: The Blue Ribbon Coalition recommended proper road maintenance, limited traffic, and utilizing gates for selective road closures as a better alternative than road reclamation. Bogle & Gates (a consultant to Washington State University) requested clarification as to what outlays would be required for "retrofitting or removal" of some stream-crossing structures as a result of DNR's commitment to minimizing adverse impacts caused by its road networks.

Response: DNR intends to consider many different methods for reducing the adverse environmental impacts of roads, including proper road maintenance, road use restrictions, road closures, and road reclamation or abandonment.

Fish blockages caused by road stream crossings, i.e., culverts, inflict a major adverse impact on salmon stocks. DNR'S commitment to the removal or retrofitting of culverts to remove blockages to fish passage is a continuation of current DNR practice.

2. Alternatives to Roads

Summary: The Washinton Forest Practices Association commented that the draft HCP, as presently worded, raises expectations for helicopter yarding and other sophisticated, expensive yarding methods. They went on to state: if that, indeed, is the intent, it should be so stated and put forward with a cost analysis.

Response: Alternatives to road construction (e.g. yarding systems) will be used where such alternatives are practicable and consistent with other conservation objectives (draft HCP p. IV.56).

N. TRAIL MANAGEMENT

Summary: Black Hills Audubon Society and 51 individuals (using an identical form letter) recommended that trails be kept out of riparian buffers, wetland buffers, and unstable slope areas.

Response: The Services did not require DNR to consider trail management in its draft HCP or draft EIS. DNR chose not to consider trail management in its draft HCP because doing so might unduly constrain DNR over the long term.

O. SPECIAL FOREST PRODUCTS

Summary: Two individuals commented on the lack of recognition and discussion of special forest products and the failure to consider the value of non-timber resources in economic analysis.

Response: Relative to timber harvest, special forest products currently gathered from DNR-managed land have insignificant environmental impacts and make inconsequential contributions to trust revenue and local economies. The Services did not require DNR to consider special forest products in its draft HCP or draft EIS. Additional details

regarding DNR's non-timber management activities are included in Appendix 3 of this FEIS (see pages A3-55 through 61) as changes to the draft HCP.

P. OTHER PRACTICES

Summary: As an example of conflicting comments on intended management, Northwest Forestry Association commented that the draft HCP discussion of riparian buffers clearly implies old-growth conditions as a target while DNR continues to state that the zones will be managed to produce timber. One individual, while supporting wider riparian buffers, proposed that additional selective harvest in the minimum 25 foot buffers would make more sense than letting the trees fall into streams.

Response: See the responses for "Riparian Management Strategy" and "Riparian Buffer Treatment." The draft HCP says that the riparian buffers will possess forest with a range of late-successional characteristics, including old-growth charcteristics (p. IV.136). Management of the riparian buffer will be site-specific, and hence, "a range of late-successional characteristics" is the expected outcome of the riparian management strategy. At some sites, forest in the riparain buffer will be best described as "mature" at other sites the forest will resemble old-growth. "Old-growth characteristics" refers to the main qualities which are typically used to define old-growth forest: multilayered canopy, at least 8 trees per acre greater than 32 inches dbh, at least 4 snags per acre greater than 24 inches dbh and 15 feet tall, etc (Franklin and Spies 1991). The possession of such characteristics by a small stand, such as a riparian buffer, does not preclude selective timber harvest from that stand.

There may be situations where selective harvest within the 25 foot no harvest area is appropriate and even beneficial to salmon habitat, but given the current state of freshwater salmon habitat in western Washington, the risks outweigh the benefits. Large woody debris are a vital element of salmonid habitat, and therefore, one function of the riparian buffer is to provide the quantity and quality of instream large woody debris that approximates that provided by unmanaged riparian ecosystems.

VII. OTHER PLAN ELEMENTS

Summary: Washington DOE, The NWIFC, Point No Point Treaty Council, Squaxin Island Tribe, Tulalip Tribes, Muckleshoot Tribe, Bogle & Gates (a consultant to Washington State University), Northwest Forestry Association, a local organization, a timber company, and three individuals commented on the HCP's implementation. Nearly all of the tribal organizations and tribes want to be consulted during plan implementation, as does the timber company. NWIFC, Muckleshoot Tribe, and one individual were concerned that the HCP's implementation is poorly described. Washington DOE implicitly recognizes this as well. Washington DOE stated that it is imperative that a process exist to track the success of implementation. Bogle & Gates (a consultant to Washington State University) stated that the draft HCP is a plan for large-scale deferrals of management combined with research. The Northwest Forestry Association suggested the creation of a new document or new section within the HCP that would provide silivicultural and operational information explaining how DNR intends to achieve the

levels of environmental protection proposed and manage forests for timber production. One individual suggested that the interdisciplinary teams of scientists involved in implementation be broad-based. Another individual asserted that no studies have been done at the district level to determine if the plan is practical to implement.

Response: The HCP is the principle document supporting DNR's application for incidental take permits and unlisted species agreements. The ESA does not require silivicultural and operational information in an HCP. Including such information in the HCP would create a prescription-based, rather than an outcome-based, document constraining management flexibility.

There are no large-scale deferrals of management. Over the short-term, the draft HCP designates five types of set-asides or deferrals: forests within 25 foot of Type 1, 2, 3, and 4 Waters; hillslopes with a high risk of mass wasting; owl nest patches; occupied marbled murrelet habitat; and forests in or adjacent to uncommon habitats such as caves and talus. Over the long term, it is anticipated that the only set-asides will be forests within 25 foot of Type 1, 2, 3, and 4 Waters, some unstable hillslopes, some occupied marbled murrelet habitat, and forests in or adjacent to uncommon habitats. Owl nest patches may be harvested after research demonstrates that silvicultural practices can produce high quality spotted owl nesting habitat. Some unstable slopes may be harvested after research demostrates that timber harvest will not increase the frequency or severity of mass wasting events. Ultimately, set-asides are expected to be a small proportion of all DNR-managed forests within the HCP planning area.

DNR believes that the plan is practical to implement. The stand and landscape prescriptions proposed in the HCP -- retaining snags and green trees, RMZ management, wetland management, maintaining 50 percent owl habitat in NRF management areas, etc.-- are based on practices that are familiar to DNR staff.

The composition of interdisciplinary teams of scientists will be dependent on the purpose for convening such a group

A. INVENTORY AND SURVEY

Summary: The Washington Chapter of The Wildlife Society and a local environmental organization recommended that DNR conduct surveys for rare and poorly known species. Both organizations commented that such surveys should be part of adaptive management practices. Bogle & Gates (a consultant to Washington State University) questioned whether there was any difference between the owl surveys and murrelet habitat relationships study conducted under Alternative A and the owl research and murrelet habitat relationships study conducted under Alternative B.

Response: Surveys for rare and poorly known species will not be included in DNR's HCP monitoring program. Because DNR's HCP is habitat based, rather than species based, such surveys are not considered necessary to minimize and mitigate the impacts to wildlife species.

There is no difference between the marbled murrelet habitat relationship study conducted under Alternative A and that conducted under Alternative B. The methods of data collection and analysis are the same under both alternatives. There is, however, a profound difference in how the results of the study would be used. Under Alternative B, forest identified as marginal habitat unlikely to be occupied by marbled murrelets would be made available for harvest, but only if DNR conducts intensive inventories in the suitable habitat and uses the information in developing long-term conservation strategies. Until a long-term strategy is aproved by the USFWS, no known occupied sites will be harvested. Under Alternative A, the results of the study could not be used to release marginal habitat for harvest because DNR would not have an HCP in place committing to long-term murrelet habitat conservation. Murrelet surveys would continue to be necessary to avoid take. Under Alternative A, information gathered through habitat relationship studies would be used to make future decisions concerning DNR-managed murrelet habitat.

Owl surveys conducted under Alternative A and owl research conducted under Alternative B are very different. The purpose of owl surveys is to protect DNR, the Board of Natural Resources, and the trust beneficiaries from prosecution for the take of a federally listed threatened species. Owl surveys are done to determine whether management activities will occur within a median home range radius of a spotted owl site center. The timing of management activities is tightly linked to the completion of owl surveys. The surveys must follow a standard protocol.

B. RESEARCH

Summary: The City of Port Angeles, Point No Point Treaty Council, Squaxin Island Tribe, Tulalip Tribes, Washington State Association of Counties, Bogle & Gates (a consultant to Washington State University), Northwest Forestry Association, the National Audubon Society, WEC, NCASI, three local environmental organizations, and nine individuals commented on research under the HCP. Point No Point Treaty Council recommended that basic scientific research be conducted before management-oriented applied research. The Squaxin Island Tribe and two individuals emphasized the need for a scientific advisory board and/or outside peer review for research conducted under the HCP. The Tulalip Tribes stated that the research goals are vague. Bogle & Gates (a consultant to Washington State University) asserted that research must be done before a competent HCP can be proposed and that there is much uncertainty as to the duration of the HCP's spotted owl habitat research phase. Bogle & Gates also wants to know the expected costs of the research projects. The Washington State Association of Counties said that knowledge should be an objective, and the City of Port Angeles and Northwest Forestry Association both said that there is a need for experimental forestry and applied forestry research, but the Northwest Forestry Association cautioned DNR to "get real" about research costs. NCASI requested more details about spotted owl research to be conducted in the OESF. The National Audubon Society said that an aggressive research program is necessary to test the assumptions used to develop the conservation strategies. WEC and two local organizations claimed that the HCP creates disincentives to do research. These same groups suggested that initially requiring a very conservative level of habitat protection would create an incentive for DNR to conduct research. Several individuals said that research is necessary to ensure the survival of endangered species.

An individual suggested that DNR establish a schedule for completion of the research phase. One individual believed that old-growth forest must be retained as a "living laboratory" in order to study forest health issues such as insect infestations and disease.

Response: An HCP is the principle document supporting an application for incidental take permits and unlisted species agreements. The purpose of an HCP is to describe the management practices and/or guidelines to which the applicant commits in exchange for incidental take permits. Given the current state of knowledge and the rate at which knowledge is accumulating, flexibility is preferable to specificity for some aspects of an HCP. This is particularly true for the HCP research program. DNR and the Services believe that the research goals and objectives presented on p. V.1 through 6 in the draft HCP are specific enough to guide the HCP research program.

Basic scientific research and management-oriented applied research will be conducted concurrently, particularly in the OESF. Research used to modify the HCP conservation strategies will be subject to review by the Sevices.

The research program will test the assumptions used to develop the conservation strategies. That is the purpose of the validation monitoring component.

The HCP does include incentives to do research. The spotted owl nest patches in NRF management areas must be deferred from harvest until DNR can demonstrate the successful application of silvicultural techniques to create functional nesting habitat (draft HCP, p. IV.7). Unstable hillslopes must be deferred from timber harvest until it can be demonstrated that harvest can be accomplished without increasing the frequency or severity of slope failure and without severely altering the natural input of large woody debris, sediments, and nutrients to the stream network.

Recognizing that forest land management cannot be delayed until all research questions are answered and all uncertainty is eliminated, DNR has proposed a plan consisting of conservation strategies based on today's knowledge and an intent to conduct research to further the knowledge. The purpose of much of the proposed research is to develop an understanding of how to enhance timber production in a manner that ensures efficacy of the conservation commitments of the HCP.

DNR agrees that some late-seral stage forest should be retained for research purposes, and DNR set aside 12 late-seral stage research areas totalling approximately 2,000 acres. These sites will continue to serve a research function under the HCP. These areas are in addition to approximately 72,000 acres in NAPs and NRCAs, many of which contain late-seral stage forest.

With regards to research funding, the draft HCP (p. V.7) states, "DNR shall request from the legislature at least $1 million per year for HCP research until the Priority 1 projects are completed."

1. OESF

Summary: Washington DOE, WDFW, NWIFC, Point No Point Treaty Council, Muckleshoot Indian Tribe, Port of Port Angeles, Bogle & Gates (a consultant to Washington State University), WEC, NCASI, a timber company, and a local organization commented on the OESF. Washington DOE stated that the focus of the OESF on answering questions related to restoring and maintaining riparian ecosystem integrity with ongoing forest management is conceptually extremely valuable. WDFW suggested that experimentation in old-growth habitat in the OESF is reasonable but DNR should proceed with caution. NWIFC commented a transition from the zoned to unzoned forest should be considered to reduce the possibility of forest fragmentation. The Point No Point Treaty Council supports the research objective of the OESF. The Muckleshoot Indian Tribe asked that information gathered in the OESF be used to modify management activities in the other planning units. Bogle & Gates (a consultant to Washington State University) described the OESF as a "forest ecology theme park" and wants to know how much it will cost and what will be the trusts' share of that cost. WEC urged DNR not to sacrifice conservation in the name of research and to make the information gathered in the OESF the challange. The Northwest Forestry Association believes that the OESF places habitat protection before beneficiary support and that it has an overly prescriptive plan which abrogates the entire reason for the OESF. The Port of Port Angeles hopes DNR will allow experimentation in the OESF that will enhance benefits to the trusts. A timber company hopes DNR will lead the way in demonstrating forest practices that provide adequate salmon habitat and allow timber harvest. A local organization thinks that the impacts of recreational use on long-term health of the forest should be studied in the OESF.

Response: It is DNR's intention that information gathered in the OESF will be used to modify management activities on DNR-managed land outside the OESF where the new knowledge is applicable. DNR intends to ensure that future modifications to conservation strategies will preserve their original intent. The goal of the OESF is to learn how to integrate production and conservation across the landscape. DNR fully expects that the information gained through experimentation will enhance benefits to the trusts. DNR will make the information gathered in the OESF widely available. (See draft HCP, p. IV.73.) DNR does not concur that the OESF plan is overly prescriptive. The forest management and fish and wildlife conservation measures described for the OESF are working hypotheses and will be modified through a program of monitoring and adaptive management.

DNR considered an alternative that was described as a transition from a zoned forest to an unzoned forest (DEIS, p. 2-35). The reasons for eliminating this alternative from the set of reasonable alternatives is presented in the DEIS, p. 2-35 to 2-36.

Research costs are those committed to in the draft HCP (p. V.7).

The impacts of recreational use on long-term health of the forest are not currently a high priority for research in the OESF.

C. MONITORING/REPORTING

Summary: The USEPA, Washington DOE, WDFW, Metropolitan King County Council, NWIFC, Point No Point Treaty Council, Muckleshoot Indian Tribe, Squaxin Island Tribe, Tulalip Tribes, Bogle & Gates (a consultant to Washington State University), the National Audubon Society, Northwest Forestry Association, WEC, Washington Native Plant Society, Washington Wilderness Coalition, Washington Chapter of the Wildlife Society, three local environmental organizations, and 60 individuals commented on various aspects of monitoring (fifty-one individuals used identical form letters). The majority of comments emphasized the importance of an adequate monitoring program. The plurality of comments, including those from USEPA, Washington DOE, WDFW, Metropolitan King County Council, NWIFC, Point No Point Treaty Council, Squaxin Island Tribe, and Tulalip Tribes, said the results of monitoring must be linked to changes in management, (i.e. adaptive management). USEPA stated that the monitoring section was the weakest part of the draft HCP. Absent a monitoring plan, they were unable to evaluate whether the overall HCP objectives are achievable. Washington DOE believes that Alternative B should meet most water-quality needs if it is implemented with adaptive management. Several comments, including those of WDFW and the Squaxin Island Tribe, recommended that validation monitoring not be limited to the OESF. The NWIFC requested validation monitoring for juvenile salmon rearing habitat, effectiveness and validation monitoring as part of the interim murrelet strategy, validation monitoring for spotted owl dispersal habitat, and the opportunity to review the monitoring plan. The Northwest Forestry Association also suggested that validation monitoring be conducted for salmon. Both the NWIFC and Point No Point Treaty Council questioned the validity of implementation monitoring that does not involve field work and said, along with the Muckleshoot Indian Tribe, that more detail is needed in the monitoring program. NWIFC and Squaxin Island Tribe questioned the lack of criteria for effectiveness, (i.e., the desired habitat conditions for salmon).

Point No Point Treaty Council and Squaxin Island Tribe asked to be involved in the review of data collected through monitoring. Several comments, including those from the Squaxin Island Tribe and WEC, suggested an oversight committee or scientific review board to evaluate monitoring data. WEC also suggested that a disinterested expert panel oversee the monitoring plans. The Washington Native Plant society wants monitoring of listed and candidate plant species. Several comments said that incentives to insure that DNR conducts adequate monitoring, such as a reduction in habitat protection if it is shown that conservation objectives have been exceeded, should be built into the HCP. The National Audubon Society asserted that the draft HCP gives no assurance that funding will be available for monitoring. An individual suggested that a trust fund be established to support monitoring in the future. The Northwest Forestry Association questioned the cost of the "open-ended" monitoring program, and Bogle & Gates (a consultant to Washington State University) asked about the expected cost of the monitoring program.

Response: DNR's obligation is to USFWS and NMFS. This does not preclude DNR from continuing ongoing working relationships with the tribe and the public. All HCPs must include a monitoring plan and assurance of adequate funding. The Services must find that these components are adequately provided or an ITP cannot be issued.

Monitoring and adaptive management are implicit in the riparian conservation strategy. According to the draft HCP, management in the riparian buffer must "maintain or restore the quality of salmonid habitat. During periodic reviews of the HCP, DNR will be required to demonstrate to the Services that it has kept this commitment. Considering the geographic scale of DNR's HCP, convincing evidence can only be obtained through a statistically valid monitoring program. Because of the trust mandate, DNR has an incentive to determine how to manage the riparian buffer for commodity production, but riparian ecosystem management must "maintain or restore the quality of salmonid habitat." This establishes a situation which calls for adaptive management.

The draft HCP has been modified to incorporate field surveys into implementation monitoring. Such monitoring will be primarily accomplished through DNR's planning and tracking system and geographic information system, but statistically valid sampling of management activities will be conducted to evaluate the reliability of information stored in these databases.

The reasons for not conducting validation monitoring on salmon are presented in the draft HCP, p. IV.65 and p. V.2. These reasons include, the watershed-level effects of forestry and non-forestry activities involving other land ownerships, the effects of salmon fisheries and hatcheries, and natural at-sea effects. Effectiveness and validation monitoring may be part of the long-term murrelet strategy. The reasons for not conducting validation monitoring for spotted owl dispersal habitat are presented in the spotted owl comment category in this section.

DNR has chosen not to specify performance standards or habitat standards for the management of riparian areas. DNR's objective is to manage riparian ecosystems so that important elements of salmonid habitat (large woody debris, sediments, detrital nutrients, and shade) are within the natural range of variability for functional habitat. For some habitat elements, in particular large woody debris and detrital nutrients, the natural range of variability or the minimum requirements for functional salmonid habitat are poorly understood. DNR anticipates that through monitoring and adaptive management our understanding will evolve to the point where scientifically credible performance standards can be specified.

There are no take prohibitions for federally listed plant species on nonfederal lands. Therefore, USFWS does not issue incidental take permits for plants, and the HCP is not required to monitor plant populations. However, the Services through the Section 7 consultation process must ensure that the action of issuing an ITP will not jeopardize any federally listed plant species. For that reason, the Services encourage applicants to consider listed and sensitive plant species during the HCP development.

Under Section 10 of the ESA, one criterion for the issuance of an ITP is that adequate funding for the plan be provided. The same criterion will be applied for unlisted species agreements. This provides assurance that funding will be available for monitoring.

State legislative authority would be required for establishing a trust fund to support monitoring.

VIII. IMPLEMENTATION ISSUES

Summary: The Services and DNR received comments from four individuals, the Hoh Indian Tribe, Prosecuting Attorney Bradley Andersen on behalf of Skamania County, the Washington State Association of Counties, NWIFC, WEC, the Black Hills and Skagit Audubon Societies, the Northwest Ecosystem Alliance, Sierra Club Cascade Chapter, Rivers Council of Washington, the Wildlife Society, The Mountaineers, and two local groups regarding general concerns on implementation. The Hoh Tribe questioned whether short term protection losses could occur without long-term gains. Skamania County wrote the HCP should be the product of "hard-nosed negotiations." Several individuals and groups including The Mountaineers, Sierra Club, and Rivers Council asserted the IA contained too many inequities favoring DNR's needs at the expense of species. These same individuals and groups wrote that the agreement must present a fair balance in needs between DNR and the public resource. The Northwest Ecosystem Alliance and another local group wrote that the agreement prevents further public involvement or citizen suit. Skagit Audubon Society wrote that the agreement would discourage research and monitoring. Black Hills Audubon wrote that an Incidental Take Permit should not be granted on the basis of such weak commitments. NWIFC stated the provision in the IA barring citizen lawsuits may violate the ESA. WEC wrote that even though IA Section 21 allows for periodic comprehensive reviews, it does not state the method of review or how policy may be affected.

Response: Over the term of implementation, the effects of take must be mitigated to the maximum extent practicable. The possibility that take occurring early in the permit term might not be adequately mitigated upon early termination could arise, creating a "mitigation debt" owed by DNR. However, adequate mitigation is a permit condition with an underlying contractual obligation on the part of the applicant. As a result, early termination resulting in a "mitigation debt" would have to be remedied by DNR, most liklely through the continuation of certain HCP provisions and permit conditions.

Modifications have occurred during the review period to address the needs of all parties and to respond to public input. The draft IA circulated for review had not been negotiated prior to publication. The IA has since been redrafted and changes in the IA are presented in Appendix 4 of this document. The Services concur with commentors that the agreement should reflect a balance of the needs of all parties and the resources involved.

The Services cannot, by contract, abrogate the statutory right concerning public comment and participationof the public to be involved in, or challenge thier actions. Accordingly, the Services note that nothing in the IA or requested ITP limits or affects the public's rights and recourse under the ESA or any other statute; language in Section 30.6 of the IA now acknowledges the rights of the public under the ESA.

A. LENGTH OF PLAN/PERMIT

Summary: The Services and DNR received comments on the length of the proposed plan from several groups, including 14 from individual commentors. Squaxin Island Tribe, Clallam County, American Rivers, The Mountaineers, Environmental Resource Center, and the 14 individuals all asserted 100 years was too long. Squaxin Island Tribe suggested a 50-year agreement allowing incremental increasing protection. Another commentor suggested that the HCP run 20 years. WEC commented that a plan where benefits only begin to be incurred after 50 years of implementation is inappropriate.

Response: HCP term length is generally decided as a matter of the purposes and needs of the applicant who engages in this voluntary process. Another major factor that affects the length of the term is the expected period of time contemplated as necessary to adequately mitigate for the amount of take that might occur. As of the time of publication of the IA, the precise term of the agreement sought had not been determined by the applicant. Nonetheless, a 100-year term is not extraordinary in view of the amount of take that is sought. The Services note that the Murray Pacific Corporation HCP and All-Species Amendment is for 100 years, the Plum Creek 2-Phase HCP could run as long as 100 years, the Weyerhauser Millicoma HCP could run 80 years, and the Oregon Department of Forestry Elliott State Forest HCP will run 60 years as to spotted owls. Following these examples, the possibility of DNR's HCP spanning 100 years is not extraordinary.

DNR and the Services have modified the term of the permit. The Implementation Agreement now calls for a 70-year term with provisions for up to three, 10-year extensions. Such extensions could occur at DNR's option if commitments of the HCP are met at year 70, or at the Service's option if commitments have not been met at year 70.

B. TRANSFERS OF LANDS, SUCCESSORS AND ASSIGNS

Summary: Nine commentors wrote or testified on this topic, including one individual. WDFW questioned the effects of DNR dispositions where the HCP would not be implemented by the new owner. Clallam County wrote about transfers to the federal government. Rivers Council, Sierra Club Cascades Chapter, The Mountaineers, and two local groups asserted transfers should be allowed only where the HCP provisions are maintained by the new owner. Washington Forest Protection Association wrote that an HCP should not encumber land exchanges.

Response: The manner in which HCP lands are disposed of by DNR during the permit term will depend on each transaction. Nonetheless, Section 17.4 of the IA now provides for mitigation if the cumulative impact of the land disposition would have a significant adverse effect on a species.

C. FUNDING

Summary: WDFW asked if DNR will move funds around to cover budget shortfalls and asked for more details on how adequate funding for the HCP will be provided. WEC questioned whether DNR can make the assurance that funding to implement the HCP will be available. One individul asked what happens in the event DNR is not funded by the State Legislature.

Response: Under Section 10 of the ESA, one criterion for the issuance of an ITP is that adequate funding for the plan be provided. The Implementation Agreement contains a provision which would allow the Services to suspend the permit should insufficient funding be provided to implement the HCP. To issue an ITP, the Services must be assured the applicant will adequately fund implementation of the proposed HCP.

D. PHASE-IN IMPLEMENTATION

Summary: Bogle & Gates (a consultant to Washington State University) stated that the paucity of long-term management activities specified under the plan, combined with the absence of meaningful time frames for such action, make it almost impossible for decision makers to assess the environmental impacts of the HCP. A local organization stated that for the plan to succeed, the decision making structure must be designed such that scientists and other ecosystem managers have significant authority in making harvest and management decisions and that this process should be clearly delineated in the documents.

Response: The plan does contain a number of provisions for future plans to be developed once data is obtained. Although the exact nature of the provisions which will result cannot be stated, the Service believes that by maintaining the ability to participate in the development of these plans, it maintains the ability to ensure the best available data is used in a responsible manner to develop sound conservation strategies. Likewise, DNR will ensure that the development of these strategies will be consistent with its trust responsibilities. By postponing components of the planning process both DNR and the Services are ensuring that commitments will not be made until effective and efficient strategies can be developed, which should benefit the trust and wildlife species.

E. LIABILITY

Summary: The Sierra Club and Society for Conservation Biology commented violations could be blamed on an agent and that DNR would not be held liable. Another environmental group stated the penalty for DNR "violating" the HCP is too weak.

Response: Section 16.3 of the IA provides that DNR shall not be liable for the unauthorized acts of agents, contractors, licensees, etc. As for penalties for "violation" of the HCP, all applicable statutory and regulatory penalties remain in effect, including the Services' ability to suspend or revoke the permit.

F. PERMIT ENFORCEMENT, SUSPENSION, OR REVOCATION

Summary: Five environmental organizations and one individual commented on this subject. Black Hills Audubon Chapter wrote that the agreement must be enforceable. Washington Wilderness Coalition and WEC wrote that the ITP should be conditioned on fulfilling monitoring requirements. Society for Conservation Biology wrote that the permit should be suspended for violations of the agreement. Finally, Rivers Council questioned how the agreement will be enforced. An individual requested increased public involvement in enforcement.

Response: Nothing in the process of issuing an ITP abrogates the duty of the Services to enforce the ESA. Permit enforcement will be carried out as a matter of programmatic responsibility and through the use of compliance monitoring, site inspection, remote sensing and aerial imagery, and other emerging techniques. Violations of the agreement can result in suspension or revocation of the permit and as otherwise provided in federal permitting regulations. Nothing in the proposal prevents interested members of the public from apprising the Services of compliance issues.

G. UNLISTED-SPECIES AGREEMENT

Summary: The Services and DNR received 14 comments, including four from individuals, discussing the proposed unlisted species agreement. NWIFC commented the process for adding unlisted species is "disturbing" and "unfair" and needs to be changed. NWIFC suggested delaying addition of newly listed species until critical habitat is designated and a recovery plan for each newly listed species is finalized. Point No Point Treaty Council wrote that DNR should bear the burden of proving the HCP adequately addresses the needs of newly listed species. The Council also wrote, that DNR should bear the burden of proving that extraordinary circumstances do not exist (as opposed to the allocation of the burden to the Service of proving that extraordinary circumstances do exist). Sierra Club Cascade Chapter, Rivers Council of Washington, and two individuals wrote that no permit should be allowed for species not listed in the HCP or for which little is known. The Mountaineers, Northwest Ecosystem Alliance, Environmental Resource Center, and two individuals asserted DNR must be made responsible for further mitigation if it becomes necessary. Washington Wilderness Coalition commented the HCP should afford more protection to candidate species.

Response: The Services respectfully disagree that presently unlisted species that become listed during the permit term should be eligible for addition to the permit only after a recovery plan and designation of critical habitat for that species are completed. There is no basis in the ESA for this suggestion. The Services note, for example, that there is no current recovery plan for the owl, the murrelet has only a draft recovery plan, and no critical habitat has been designated for grizzlies, wolves, eagles, or falcons. None of these currently listed species would be eligible for coverage in an Incidental Take Permit under the commentor's suggestion. The unlisted species process proposed in the underlying agreement was analyzed in the DEIS and revisited in this document. Those provisions capture an agreement that was subject to extensive negotiation and refining so that it best implemented the intent of Congress as embodied in the ESA, as stated in H.R. CONF. REP. No. 835, 97 Cong, 2d Sess, 30 (1982) and as restated by the Departments of the Interior and Commerce in the No Surprises Policy of August 1994.

The HCP proposes a habitat-based aproach to conservation for all species, including those species that are currently unknown. The primary assumption of the unlisted species conservation strategy is that if adequate amounts of habitat of sufficient quality are provided, these species will persist. The question is whether the combination of the described protective measures, natural diversity within the habitats on DNR-managed lands, and the diversity of treatments to be implemented under the HCP would provide a sufficient amount of habitat. The Service will provide further discussion of the HCP

effects and mitigation in its Section 10 findings document prior to a decision on permit issuance or approval of the Implemention Agreement.

H. DEPARTMENT OF THE INTERIOR and DEPARTMENT OF COMMERCE ASSURANCES POLICY

Summary: Two individuals commented that DNR should bear the burden of meeting stricter future ESA regulations. One individual commented DNR should bear the burden of funding further protection if it becomes necessary. WEC asserts that Section 12 of the IA violates the ESA and constitution.

Response: When Congress amended the ESA to include Section 10, they intended that the Federal Government give long-term assurances to landowners that engage the Section 10 process (H.R. CONF. REP. No. 835, 97 Cong, 2d Sess, 30 (1982). Congress expressed its intent that landowners operating under an approved plan be assured that the landowner not be required to provide further mitigation in the form of compensation or other lands except under extraordinary circumstances (see comment category Extraordinary Circumstances on p. 3-157 in this section). The Interior and Commerce Departments recently reiterated this commitment to landowner assurances in the so-called "No Surprises Policy" (USDI/USDC, 1994). In the No Surprises policy, the Secretaries provided that the government would bear the burden of proving that circumstances have arisen necessitating a revisiting of the mitigation measures in a previously approved plan. The present agreement faithfully integrates this policy. Should extraordinary circumstances arise and no other source of the necessary mitigation be available, the Services will indeed be able to request further mitigation from DNR. As to comments regarding the IA, please see above. The IA has since been redrafted.

I. LEVEL OF CERTAINTY/UNCERTAINTY

Summary: The Services received eight comments, including two from individuals, generally addressing certainty. Washington Hardwoods Commission and Green Crow (a forest products company) commented on harvest level certainty. The Washington Wilderness Coalition, Sierra Club Cascades Chapter, and Rivers Council of Washington criticized the apparent imbalance between certainty for harvest levels and certainty for resource protection. Bogle & Gates (a consultant toWashington State University) asserted the DEIS and draft HCP are overwhelmingly uncertain to enable decision making. Two individuals wrote the Services should err in favor of resource protection.

Response: Certainty is a value that all parties to the Section 10 process seek for their respective interests. The Services are aware of the appearance that one resource may appear to gain a higher level of certainty than another, such as the appearance that an HCP proponent receives more certainty than the species for which they are seeking a permit to take. Appearances aside, certainty in the Section 10 process is necessarily a two-way street. As presented in the DEIS, greater certainty is derived for fish and wildlife resources as well as timber management under the proposal than would occur without it. This is especially true for presently unlisted species dependent on habitats on DNR-managed land that would not receive any beneficial or prescriptive attention under the No Action alternative, but would under the HCP because of the range of habitats that are addressed. For response to harvest certainty, please see Harvest Levels topic.

1. Unforeseen Circumstances

Summary: Ten commentors, including four individuals, provided comments on unforeseen circumstances. National Audubon Society, Sierra Club Cascades Chapter, The Mountaineers, WEC, and one individual all suggested DNR should be required to provide more mitigation if unforeseen circumstances arise. One individual asked what happens in the event DNR is not funded by the State Legislature. Three other individuals wrote that the process for increasing mitigation should be made easier.

Response: ESA implementing regulations provide that a proposed conservation plan must specify "[w]hat steps the applicant will take to monitor, minimize and mitigate such impacts, the funding that will be available to implement such steps, and the procedures to be used to deal with unforeseen circumstances..." (50 CFR 17.22(b)(1)(iii)(B) and 50 CFR 17.32(b)(1)(iii)(C)(2)). In addition, before issuing the permit, the Service must find, among other things, that "the applicant will ensure that...procedures to deal with unforeseen circumstances will be provided..." (50 CFR 17.22(b)(2)(iii) and 50 CFR 17.32(b)(2)(iii)). Unforeseen Circumstances have been defined as circumstances that may change over time, generating pressure to reconsider the mitigation commitments in an HCP (USDI and USDC 1994 -- No Surprises Policy). (See Appendix 6 of this document for a reproduction of the No Surprises Policy.)

The HCP provides procedures to deal with Unforeseen Circumstances. First, many components of the HCP rely on adaptive planning in response to research and monitoring. As such, the HCP is intended to minimize the possibility of unforeseen circumstances arising. Second, in enacting Section 10(a)(1)(B) of the ESA, Congress intended that permittees receive long-term assurances that terms of an approved plan would be adhered to by the federal government and that further mitigation requirements would only be imposed in accord with terms of the approved plan. Reiterating this intent, the Secretaries of the Interior and Commerce established the "No Surprises" policy entitled "Assuring Certainty for Private Landowners in Endangered Species Act Habitat Conservation Planning" to provide guidance in negotiating unforeseen circumstances provisions in HCPs. Consistent with this policy the Services may initiate Unforeseen Circumstances Consultation regarding the underlying circumstances.

In the event DNR has not appropriated sufficient funding to implement the HCP, the Services, under the Implementation Agreement, may suspend or revoke the permit.

2. Extraordinary Circumstances

Summary: Nine commentors, including three individuals, wrote regarding extraordinary circumstances. WDFW asked whether finding extraordinary circumstances affects Section 24.3 of the IA. NWIFC commented that the IA was drafted to preclude the Services' ability to invoke extraordinary circumstances. The Point No Point Treaty Council wrote that DNR should have to fund further mitigation, even under extraordinary circumstances. Washington Wilderness

Coalition wrote that DNR should have to adapt management to account for new information. WEC wrote that there is a lack of consequences for a finding of extraordinary circumstances, especially regarding unlisted species; that IA Section 24.3 makes no sense because, by definition, mitigation for unforeseen circumstances (sic) will involve additional or different land use restrictions; and that in effect, the provisions of Sections 23 and 24 of the IA define any land use restriction beyond those provided for in the HCP as a regulatory taking.

Response: Several writers based their comments regarding extraordinary circumstances on the draft IA circulated with the review package. The draft IA was prepared by DNR counsel without negotiation and revision prior to publication and therefore did not capture the extraordinary circumstances concept as the Services have been implementing it with other landowners operating under HCPs in this region.

As alluded to above, Congress intended for HCP proponents to receive the government's assurance that the terms of an approved agreement would be upheld except where doing so would lead to significant negative effects on the affected species' population. The IA was redrafted to capture this intent, and the changes appear in Appendix 4 of this document.

J. CONTINGENCIES

Summary: The Services received 17 comments on contingencies, including six from individuals. Nearly all comments on this topic reflected a similar concern. In summary, the concern was the HCP lacked any possibility for improvement through time to deal with any number of contingencies such as species delisting, failure of the protection strategy, and incorporation of new information.

Response: The HCP contains a number of provisions to allow change. First, there are places where flexibility has been incorporated into the HCP. In addition, either party may propose an amendment at any time. Adaptive-management provisions allow certain components of the HCP to be upgraded whenever necessary as a result of information that was unavailable previously or which indicates that the mitigation objectives are not being met. Also, the Service may require a redistribution of mitigation in the case of extraordinary circumstances. Similarly, DNR may propose an amendment if a species is downlisted or new information presents opportunities for more effective mitigation at a lower cost.

1. Level of Flexibility

Summary: WDFW, City of Port Angeles, and the Port of Port Angeles commented that flexibility needs to be incorporated into the HCP in order to adapt management actions resulting from research and experimentation.

Response: The flexibility sought by the commentors already exists in the HCP. For example, details regarding flexiblility may be found in the draft HCP in Chapter V and those portions of Chapter IV covering owls, murrelets, riparian areas, and other

resources. As to adaptive management, see the heading Adaptive-Management Techniques in this section on the following page.

2. Amendments

Summary: WEC suggested HCP amendments be attended to by a Supplemental Environmental Impact Statement and a 60-day public comment period. In public hearing, the Environmental Resource Center asserted that the HCP is unrealistic in not allowing other species to come under HCP protection for the next 100 years.

Response: Each amendment would be assessed as to whether it warranted treatment for public review purposes under NEPA. The Services will consider a variety of factors in making that decision and, if NEPA is warranted, will decide on the appropriate forum for such review (categorical exclusion, Environmental Assessment, or Environmental Impact Statement). For instance, minor changes in the way mitigation is provided that do not alter the amount or effectiveness of mitigation nor the amount of take may not require public review. With regard to the Environmental Resource Center's response, the Service believes this commentor is suggesting that newly listed species should be granted additional protection, where necessary, to ensure they are adequately addressed. Prior to adding a newly listed species to the permit, the Service would complete a Section 7 consultation. Depending on the outcome of that consultation, and other responsibilities of the Services, additional conditions may be necessary in order for that species to be added to the permit.

3. Adaptive-Management Techniques

Summary: The USEPA commented that more information was needed concerning proposed adaptive-management techniques and programmatic monitoring. WDFW, Point No Point Treaty Council, and the City of Port Angeles asked if there is a mechanism to incorporate new research into current practices. Washington DOE commented that Alternative B would be adequate if an adaptive-management techique mechanism is in place. The Squaxin Island Tribe, NWIFC, Whidbey and Black Hills Audubon, Sierra Club Cascade Chapter, Puget Sound Chapter of the Society for Conservation Biology, and three individuals commented that the HCP should require incorporation of new information from monitoring into management practices. The Wildlife Society mentioned the need for credible monitoring. Tahoma Audubon Society suggested establishing a Scientific Advisory Board to review and implement research findings.

Response: The HCP includes provisions for adaptive management in a number of areas that are defined in the Implementation Agreement. The riparian management strategy provides specific mechanisms that would include Service participation in developing site-specific treatments, input into the monitoring that would be used as feedback for adaptive-management purposes, and objectives to be met as mitigation. The northern spotted owl habitat definitions would also be subject to adaptive management and would be updated as new information became available.

K. TERMINATION CLAUSE

Summary: The Hoh Tribe and NWIFC expressed similar comments regarding the possible need for DNR to continue complying with the HCP to adequately mitigate for past incidental take, should DNR terminate early. NWIFC and one individual commented that the language does not clearly define additional mitigation requirements in the event of early termination as described in the IA. Washington State Association of Counties supports the 30-day opt-out provision. Seven individuals and WEC, Washington Wilderness Coalition, and another group wrote that the terms should apply equally to both parties. Green Crow wrote that post-termination mitigation requirements would be so costly that termination is not a viable possibility. Several individuals criticized the ability of DNR to terminate on 30-days notice.

Response: Section 27.0 of the IA provides for potential mitigation in the event of termination. As to those comments regarding perceived unfairness of the terms of the agreement, as discussed above, the IA was prepared by DNR and published with the HCP without review and revision by the Services. Negotiation of the underlying agreement has resulted in a redraft of the IA. At this time, it is premature to predict the cost of any continuing mitigation requirement that might be incurred by DNR if it terminates early; there is not a basis for making any such prediction.

IX. RELATIONSHIPS TO OTHER LAND MANAGEMENT

Summary: WDFW requested that DNR consider WDFW ownerships similar to Federal designations (Congressional Reserves, LSRs, MLSRs, AMAs) where spotted owls are targeted in WDFW land-management plans. At the Seattle public hearing, an individual representing WEC discussed three reasons why it is inappropriate to compare DNR's HCP with private landowners' HCPs: (1) DNR can not sacrifice future income for present income, private landowners can; (2) DNR manages a much larger area than any private land owner and therefore has a greater responsibility to ensure that cumulative effects are not riskier to species; and, (3) DNR has a responsibility to be on the "cutting edge" of scientific forestry. The Washington State Association of Counties provided a preliminary determination that the draft HCP was compatible with local planning goals and objectives. The conservation group American Rivers stated their concern that implementation of the HCP would affect the success of their watershed restoration efforts and requested larger riparian buffers. One individual noted the committments of the HCP, when added to the current regulations of the Olympic National Park, Olympic National Forest, Coastal Marine Sanctuary, Scenic Coastal Corridor, and the Proposed Straits Marine Sanctuary, would over-regulate the residents of the Olympic Peninsula. Another individual asked DNR not to consider bio-region approaches; adding adjacent state lands to federal no-management lands only exacerbates the problems of fire, disease, pest, and economic loss. One individual remarked how flying over or driving through Washington illustrated the amount of timber harvest and lack of replanting across the landscape. One commentor expressed his belief that DNR-managed lands should be managed to provide ecological protection for water, fish, recreation, and wildlife since private lands cannot or will not provide them. Another individual felt that in order to influence private landowners to propose HCPs of their own, DNR's HCP should include stronger mitigation measures and eventually serve as a model plan.

Response: WDFW does not maintain control over the surface rights on all their lands. The timber rights to much of the lands in question are held by private parties and, as such, no gaurantee of continued maintenance for owls is provided. DNR may be different than other nonfederal entities, but they clearly are a nonfederal entity and are appropriately treated as such in regard to the proposed HCP. The Service and DNR acknowledge the preliminary determination made by the Washington State Association of Counties. The Service is not familiar with the American Rivers' watershed restoration project, but it believes DNR's HCP riparian management measures should significantly contribute to the restoration of healthy aquatic and riparian systems. Regarding over-regulation on the Olympic Peninsula, the Services note that DNR has voluntarily applied for an ITP in an effort to reduce the regulatory burden associated with current and future listed species and associated constraints on management. The HCP should provide DNR with greater latitude in management of its resources. Additionally, few of the lands covered by the HCP will be unavailable for management. DNR maintains the ability to manage its lands in response to the occurrence or threat of such catastrophic events. The Service agrees that the Washington landscape has been heavily impacted by logging. However, in most places, it is not a result of lack of replanting. Replanting is mandated by State regulations, has been a common practice for a number of years and the potential for natural reforestation is very high. Some areas not properly replanted did revert to alder as a result of past harvest actions. The major factor is the length of time required for a clear-cut to develop into a mature stand of conifer. The Service also notes the difficulty in detecting replanting attempts from an airplane or car. The Service agrees that DNR has a responsibility to protect the natural resources listed by the commentor; however, the Service also believes this is a responsibility of other nonfederal landowners.

A. RELATIONSHIP TO MANAGEMENT ON FEDERAL LANDS

Summary: The Tulalip Tribes commented DNR should not rely on federal lands and management practices to protect spotted owls and other species. Skamania County inquired if they can receive HCP "credit" for timber land transferred to the U.S. Government under the Columbia River Gorge National Scenic Area Act. The Port of Port Angeles noted that past harvest limits were arbitrarily excessive, but if DNR were to consider the owl sites on federal lands, DNR could increase harvest levels over time. Bogle & Gates (a consultant to Washington State University) commented that DNR is not compelled to provide habitat because the habitat on federal lands has not yet reached its maximum potential. The Puget Sound Chapter of the Society for Conservation Biology noted DNR could better arrange potential owl habitat to support populations on federal lands by reducing the edge-to-area ratio. The Northwest Biodiversity Center commented that DNR has the responsibility of assuring the survival of many invertebrates because DNR-managed lands are located at relatively low elevations (compared to U.S. Forest Service or National Park forest lands), forest invertebrate faunas typically are more diverse in the lowlands, and a much smaller percentage of late successional forest remains at low elevations. NCASI questioned the assumption that having combined federal/state owl cluster areas with more than 25 pairs would provide more assurance against extinction than supporting owl clusters with 5-10 pairs. Two individuals commented that the passage of the Timber Salvage Rider increased DNR's responsibilities to preserve spotted owl habitat. One individual stated federal lands are enough for habitat protection and DNR-managed lands are not needed for habitat

protection. Conversely, another individual stated DNR's HCP should stand on it own merits and not rely on federal lands. A conservation biology student noted that connectivity to link similar habitat types on federal and private lands is essential.

Response: The Service notes, from a biological standpoint, that ownership matters less than whether the appropriate level of conservation is provided. Where sufficient conservation is provided on federal lands, it may not be required on nonfederal lands. Unfortunately, this is seldom the case. Even under the President's Northwest Forest Plan, many areas designated as Late Successional Reserve have been heavily impacted by past logging. Some LSRs will take decades to recover. Much of the federal land occurs at high elevations and, therefore, cannot substitute for the lower-elevation nonfederal habitats.

The focus of DNR's owl strategy is to support the President's Northwest Forest Plan's effort to conserve owls. The intent is to focus conservation where it is both most needed and most effective so as to derive the most conservation benefit with the least impact to DNR's trustees. Regarding the comment from Bogle & Gates (a consultant to Washington State University), the Service notes that this is the very reason the nonfederal lands are needed until federal habitats can be provided in sufficient amount. The owl strategy of maintaining 500-acre patches within a landscape providing 50 percent of the land as foraging habitat was designed specifically to reduce the effects of fragmentation. At landscape levels of 50 percent or more, patches tend to become larger and more connected (Lehmkuhl and Raphael 1993). Most available scientific literature suggests that owl clusters of 20 or more pairs are needed to support viable populations.

While several timber sales have been authorized by Section 2001 of the 1995 Rescissions Act (P.L. 104-19), the Services do not believe that the biological integrity of the President's Northwest Forest Plan has been significantly compromised as a result. The President's Northwest Forest Plan calls for an extensive system of Late-Successional Reserves, protection of riparian reserves, the maintenance of dispersal habitat throughout federal lands, and a monitoring program aimed at ensuring the effectiveness and validity of the plan.

Timber sales harvested pursuant to P.L. 104-19 are not expected to seriously affect the role of the President's Northwest Forest Plan as the foundation for conserving late-successional forest species. The majority of the timber sales released by Section 2001(k) of P.L. 104-19 were located in Oregon. Most of the 2001(k) sales that occurred in Washington were previously consulted on under the Endangered Species Act for spotted owls and, from the owl's perspective, were considered harvested when the Service completed Section 7 consultation for spotted owls under the President's Northwest Forest Plan. Therefore, harvest of the 2001(k) sales in Washington has caused few impacts to northern spotted owls that were not previously considered by the Service.

HCPs are most functional when they complement the other conservation efforts being conducted. The President's Northwest Forest Plan is the foundation upon which many other plans have been built. It is impossible for other land-management plans, including DNR's, to stand on their own merit. If federal lands no longer provided conservation

benefits for many species, such as the northern spotted owl, DNR-managed lands could not prevent the extinction of the owl. However, this does not mean that many DNR-managed lands are not indispensible for the continued maintenance of owl clusters. The Service agrees with the comment regarding the need for connectivity.

B. FEDERAL LANDS TAKE BURDEN

Summary: The SDS Lumber Company discussed their findings that the amount of habitat on federal lands has been underestimated and that a proper analysis of federal lands should be completed prior to determining the level of protection on nonfederal lands.

Response: The Service notes that it has received similar comments specific to the Klickitat region in other areas. While in some places habitat amounts may be underestimated, in others they are overestimated. Much existing habitat will also remain or become unusable due to its isolated location on the landscape. The Service is carefully assessing the necessary contributions of habitat on nonfederal lands across the state.

C. LANDSCAPE-ASSESSMENT PROCESSES (WSA, BASELINES, THRESHOLDS)

Summary: Washington DOE expressed their intent to work with DNR to develop TMDL priorities for impaired streams along the coastal area of the OESF.

Response: For the purposes of simplifying the analysis, two assumptions were used by DNR in the HCP to calculate the distribution of salmonids within six planning units. These general assumptions are appropriate, given the purpose of the analysis; the results are presented in Tables III.11, 12, and 13 of the draft HCP. The stated intention was to display the magnitude of the potential impact that DNR forest management may have on salmonids. Other assumptions would not likely change the overall percentages. The HCP is a process which addresses many of the same concerns as the TMDL process under the Clean Water Act. The HCP is not designed to provide exemption from the Clean Water Act; however, the Services believe HCPs in general provide an excellent foundation upon which to build. In most cases, TMDL concerns should be able to be resolved with a minimum of additional effort. The Service appreciates the intent of Washington DOE.

X. THIRD-PARTY INVOLVEMENT

A. TREATY RIGHTS AND THE FEDERAL TRUST RESPONSIBILITY

Summary: The Muckleshoot Indian Tribe, NWIFC, Point No Point Treaty Council, Squaxin Island Tribe, Tulalip Tribes, and theYakama Indian Nation all provided comments on the federal government's Trust Responsibility to Indian Tribes regarding certain resources. Similar comments were provided by each of the commentors regarding the responsibility of the federal government to consider the effects of any proposal on resources to which the Tribes have certain rights preserved in treaty. Individually, the Tribes and NWIFC asserted that because their rights regarding resources such as salmon are preserved by Treaty rights, and since the proposed action may affect the amount of such resources available to the Tribes, ESA Section 10 permit issuance criteria are superseded by treaty rights. In this regard, the Squaxin Island Tribe wrote that their comments were being provided per their treaty rights,

not in consideration of the ESA. The Squaxin Island Tribe wrote that the HCP must protect treaty resources. Point No Point Treaty Council wrote that DNR also has a duty to uphold the treaty-protected rights of the Tribes. The Muckleshoot Indian Tribe and NWIFC wrote that the EIS must consider and analyze the effects of the HCP on treaty resources. The Tulalip Tribes requested documentation that the HCP will be consistent with the general trust responsibilities to the Tribes as described in Secretarial Order No 3175, issued by the Secretary of the Interior.

Response: The Services acknowledge the government's Trust Responsibility to the Tribes regarding treaty-protected resources that are affected by the proposed action. The Services have considered the effects of the proposed action on all species addressed in the HCP. Included in the comparison of effects to those species is the comparative analysis of effects to those species that are also covered by treaty rights. The analyses of these species/resources of concern to the tribes, therefore, appear in Chapter 4, Sections 4.2, 4.3, 4.4, 4.5, 4.8, 4.9 and 4.11 of the DEIS.

The Services believe that the proposed HCP would increase the overall amount of protection these resources would receive compared to proceeding under present Forest Practices Rules, as would occur in the absence of implementing the proposed HCP. For example, the proposed HCP provides for larger buffers in areas that influence factors that contribute to fully functioning riparian areas and, hence, fish habitat. Again, these areas get much greater protection under the proposed action than the protection they would receive without the HCP. Current state regulations would provide smaller buffers on fish-bearing streams and little if any buffering of perennial or intermittent streams. Furthermore, the measures proposed under the HCP that would have beneficial effects on fish habitat quality would begin upon approval of the HCP, rather than waiting until, such time as federal regulations are promulgated in response to a listing decision.

Nothing in the proposed HCP, IA, or ITP is intended to limit the Services' responsibilities to Native Americans. Consistent with Secretarial Order No. 3175, dated November 8, 1993, and the President's May 4, 1994 memorandum regarding Government-to-Government Relations with Native American Tribal Governments, the Services have consulted, and are continuing to consult, with the affected Tribes regarding this issue.

The Services acknowledge, but disagree with, the comment made by some Tribal reviewers and their representatives that the responsibilities of the federal government owed to Indian Tribes under the federal Trust Doctrine supersede Section 10 issuance criteria. The HCP process and the federal government's trust responsibilities to the Tribes are compatible. Although an ITP authorizes take, an HCP would not be approved that does not adequately minimize and mitigate the effects of the potential take. Accordingly, and as mentioned above, the effects analysis concerning the trust resources mentioned has been conducted, and the Services believe, based on that analysis, that the resources would be beneficially affected. The Services have discussed their rationale for this impression, with the interested Tribes and their representatives at the June 12, 1996 consultation that occurred at NWIFC. The Services are obligated to document certain findings when their actions are negatively affecting Treaty rights. In this instance, the Services' action is expected to result in improved conditions for salmon and is not expected to negatively affect this Treaty resource.

B. TRUST RESPONSIBILITY TO TRIBES (in section 3.3 only)

XI. TRUST BENEFICIARIES

Summary: A state representative, the Squaxin Island Tribe, the Yakama Indian Nation, Bogle & Gates (a consultant to Washington State University), a Clallam County commissioner, a Metropolitan King County Council member, a Skamania County elected official, the Washington State Association of Counties, the City of Port Angeles, the Washington State office of the National Audubon Society, the Washington State chapter of the League of Women Voters, WEC, The Mountaineers, the Northwest Forestry Association, the Washington Contract Loggers Association, one local environmental organization, a lumber company, and 24 individuals made general comments pertaining to trust beneficiaries and DNR's fiduciary responsibilities.

Seven commentors supported the conservation efforts of the HCP, saying: management should simultaneously benefit the trust beneficiaries and wildlife; the HCP seems to provide predictability and sustainability in revenues; the HCP would double one county's income; DNR-managed forests as a funding source are the best way to safeguard the environment; undivided loyalty to trust beneficiaries does not excuse the state from following the law; and the HCP is the only course that complies with the trust mandate. Thirteen commentors wanted more conservation, with comments that included: (1) Omitting east-side aquatic resources will hinder DNR's ability to meet trust obligations; (2) Find other alternatives to funding schools; (3) Conservation should take precedence; (4) Don't destroy the forests to fund schools; (5) It is short-sighted to maximize short-term revenue, which would bring production down eventually, thereby violating the trust mandate; (6) Conscientious management will ensure productivity for the trusts; (7) Trust obligation is not limited to the current generation; (8) The trust mandate should not be misinterpreted too narrowly and in a short-term context; (9) Loss of a healthy ecosystem would lead to a decline in DNR's ability to provide funding to state schools; and, (10) DNR-managed lands are not for special interest groups but to support all equally, benefitting wildlife as well as beneficiaries. Five commentors wanted less conservation, with comments that included: (1) There are no roadblocks to timber management; (2) Wildlife conservation should not subjugate legislated objectives; (3) The HCP is a grave injustice to the beneficiaries; (4) The HCP fails to meet the trust mandate and the "paramount duty" provision of state law; (5) The only job of trust lands is to produce income; and, (6) The HCP emphasizes recovery of endangered species over trust responsibilities.

Commentors raised several concerns, including: (1) Wanting assurance that the county assets are managed in the best interests of the county citizens; (2) Suggesting each county should be treated as a separate trust; (3) DNR has a wider public interest than just being responsible to the beneficiaries; (4) Public assets of natural resources cannot be obliterated to benefit trusts; (5) Manage for both wildlife and the trusts; (6) The trusts can benefit from wise stewardship; (7) Disappointment that the University of Washington is opposed; (8) No non-sustainable short-term plans; and, (9) Consider what is best for the trusts. One commentor called for additional economic analysis and provided examples to consider. Four commentors called for other sources of support for the beneficiaries. Questions raised by commentors included: Are

Alternatives B and C too expensive? and, Would the Board of Natural Resources be part of any changes?

Response: DNR's HCP is expected to increase certainty, stability, and flexibility in trust land management and conservation of wildlife habitat by providing greater certainty regarding federal wildlife regulations, greater stability in harvest levels and resulting revenues, and greater flexibility in operations. The section titled Trust Duties in Chapter II of the draft HCP provides more detail on DNR's trust mandate and how the HCP would allow the department to better meet its trust responsibilities. Finding other funding sources for the trust beneficiaries is beyond the scope of this project. The Board of Natural Resources will be involved in changes to the HCP from the draft to the final. If the HCP is approved and adopted, the Board would remain involved in the implementation process at a policy level, according to their legislated responsibilities. DNR does not believe Alternative B to be expensive, given today's costs of owl and murrelet surveys. Additionally, Alternative B will reduce the risk of violating the Endangered Species Act and will provide protections if additional species are listed in the future.

A. MAXIMUM BENEFIT FOR TRUST

Summary: The Squaxin Island Tribe, the Washington State Association of Counties, the Port of Port Angeles, the Washington Hardwoods Commission, WEC, the Northwest Forestry Association, three timber companies, one local forest commodity organization, and two individuals commented on the maximum benefit for the trusts.

Three commentors called for more conservation, saying (in essence): (1) It would be cheaper to have no harvest in the areas designated as minimal harvest in the riparian management zone; (2) It is short-sighted and irresponsible to advocate maximizing revenue; and, (3) Trust lands should be managed to benefit equally present and long-term recipients of proceeds. Four commentors called for less conservation, with two saying riparian management zones should maximize revenues to beneficiaries. One commentor said the goal for spotted owls in the OESF is greater than federal requirements, which violates trust responsibilities, and another commentor said the difference between current practice and what is proposed for riparian areas has a direct bearing on the stumpage value available to the trusts. Five commentors raised concerns such as: (1) Maximum income should be balanced between long and short term; (2) The certainty the HCP offers is that trust revenue will be lost; (3) DNR is mandated to produce the most substantial support possible over the long term (two commentors); and, (4) Trust beneficiaries should have public interest at heart enough to not take positions just for short-term profit. One commentor stated that although DNR's mandate is to maximize revenue to trust beneficiaries and not to protect the hardwoods industry, hardwoods represent sizeable income to the beneficiaries.

Response: Chapters I and II of the draft HCP discuss DNR's trust responsibilities as trust manager, including a discussion of providing the most substantial support possible over the long term, undivided loyalty, prudent management, as well as the need to follow laws that have general applicability, including the Endangered Species Act.

B. OBLIGATION TO FUTURE GENERATIONS

Summary: The Port of Port Angeles, WEC, the Washington Wilderness Coalition, the Washington chapter of the League of Women Voters, three local environmental organizations, an independent forester, another local organization, and 12 individuals commented on the obligation to future generations.

One commentor supported the conservation plan, saying it benefits long-term productivity. Eight commentors call for more conservation, saying: (1) DNR cannot satisfy its fiduciary responsibilities unless it manages the lands in ways that maintain healthy, productive forests for future beneficiaries; (2) Our children will judge whether we conserved enough today; (3) Endangered species need to be preserved for future generations; (4) DNR is obligated to present and future generations to protect biodiversity and ecological functions; (5) DNR and the Board of Natural Resources need to remember that trust obligations are for not only the present, but the future as well; (6) Managing in a more ecologically sound manner will allow DNR to better fulfill its legal responsibilities to present and future beneficiaries (two commentors); and, (7) A perpetual trust demands intergenerational equity. Concerns raised by commentors include: (1) If future trust recipients are to benefit, experimentation and scientific data must be used to the benefit and not detriment of the trust; (2) A 100-year commitment does not manage the lands for future generations; (3) Revenue must be assured in perpetuity; (4) The long-term sustainability of trust lands are at stake; (5) Maintain productive, hardy forests into the future; (6) Need to put more emphasis on future uses, not just short-term immediate use; and, (7) will the HCP ensure hardwood forest productivity for future generations? Two commentors said the lands are managed for present and future beneficiaries. Another said not to favor either present or future beneficiaries. A fourth commentor said the trust mandate is prudent, ecological management to preserve the trust for future beneficiaries. A fifth commentor said the trust lands were established to provide revenue for education of children. One commentor was pleased that the HCP cover letter acknowledged the necessity of protecting the long-term health of the forest and the ecosystem in order to preserve the productivity of the trusts in perpetuity.

Response: The HCP will allow increased flexibility in management operations and will keep options open for future sources of income from trust lands. To preserve future options, DNR must avoid actions that are likely to have a negative impact on long-term productivity of trust lands. These were important considerations for DNR as a manager of perpetual trusts. Implementation of the HCP, no matter how long the commitment, will allow for changes as new information is learned that can benefit future generations.

C. PRUDENT PERSON DOCTRINE

Summary: A state representative, a Metropolitan King County Council member, a Skamania County elected official, the City of Port Angeles, the Port of Port Angeles, the Washington chapter of the National Audubon Society, WEC, The Mountaineers, and nine individuals provided comments on the prudent person doctrine.

Four commentors supported the conservation plan, saying: (1) The HCP should reduce the risk for future federal listings of endangered and threatened species; (2) The HCP provides certainty to the trust land managers while benefiting the public by protecting water, fish, and wildlife; and, (3) The stated purposes and goals of the HCP were agreed to. Eight

commentors wanted more conservation, saying: (1) The prudent person doctrine includes long-term preservation of the state's forest ecosystem and endangered species (four commentors); (2) Public resources, including water, fish, and wildlife, should be protected; (3) It is not prudent to clearcut 96 percent of the forest; (4) DNR is obliged to manage the trusts in compliance with the law, including the Endangered Species Act; and, (5) The prudent manager provides additional protection to assets such as wildlife. One commentor wanted less conservation, saying the trust estate needs to be preserved. Concerns raised by commentors included: (1) The state should carefully consider the impacts of a 100-year contract with the federal government; (2) Would a prudent private trustee blend all separate trust assets into one pool and still fulfill fiduciary obligations to each of the various trust beneficiaries? (3) Public resources including water, fish, and wildlife, must be protected; (4) All applicable environmental laws must be followed; (5) In financial terms, the principal (trust lands) must be prudently managed to continue to produce interest indefinitely; and, (6) the trust mandate calls for prudent, ecological management to preserve the trust for future beneficiaries.

Response: The section titled Trust Duties in Chapter II of the draft HCP discusses the prudent person doctrine of trust land management and how the HCP is expected to allow DNR to better fulfill its duties as a prudent trust manager in several ways. Among these are providing greater certainty and stability in complying with the Endangered Species Act while producing substantial long-term income for trust beneficiaries, allowing more predictable timber sales levels, ensuring future productivity of trust lands, keeping options open for future sources of income from trust lands, increasing management flexibility, and reducing the risk of loss to the trusts.

D. USE OF REGULATORY MINIMUMS

Summary: The Washington State Association of Counties stated that state and federal laws and policies should be met, but not exceeded.

Response: The HCP is an alternative method of complying with the Endangered Species Act. In addition, issuance of the ITP will reduce the risk of non-compliance.

E. OTHER DNR AGREEMENTS

Summary: The Muckleshoot Indian Tribe, a Clallam County commissioner, and one individual commented on other DNR agreements. One commentor said the HCP lacks discussion of court-mandated obligations to the Treaty Tribes. Another commentor said that since the Hoh Agreement was signed in 1993, there have been no timber sales (other than thinning and salvage) in the Hoh-Clearwater block. A third commentor said DNR should no longer sell timber to companies that clearcut.

Response: DNR is required to adhere to state and federal laws, including laws regarding Tribal rights. This requirement will continue under the HCP. DNR's authority to enter into agreements to further the interests of the trusts is important to meeting site-specific management needs.

F. PROJECTED HARVEST & REVENUE

Summary: One state representative, Bogle & Gates (a consultant to Washington State University), a Clallam County commissioner, a Stevens County commissioner, the Washington State Association of Counties, the City of Port Angeles, the Port of Port Angeles, the Washington Hardwoods Commission, the Northwest Forestry Association, the Washington Contract Loggers Association, two wood products companies, an independent forester, a local organization, and seven individuals commented on projected harvest and revenue calculations.

One commentor wanted more conservation, saying the degree of cutting could not be sustained. Another commentor wrote the DEIS lacks cost comparisons. Three said the analysis was incomplete, calling for analysis to support the projected harvest levels, and the costs were underestimated while the revenues were overestimated. Several commentors made requests for additional information, and one commentor suggested another comparison study. Two commentors did not believe the harvest projections, and one said the Olympic Experimental State Forest riparian strategies were not included. Concerns raised by commentors included: (1) meeting the projected harvest levels; (2) the necessity for more information and analysis; (3) the inadequacy of the economic analysis; and (4) the need for better analysis of impacts on hardwoods.

Response: The comparison of projected harvest levels and sales revenues under the HCP and the No Action alternative was outside the scope of the environmental review process. However, DNR's methods for making this comparison were reviewed by Rebecca Tuttle Baldwin, an outside independent expert in resource economics and environmental analysis, for Foster Wheeler Environmental corporation. She found the assumptions and methodology to be appropriate. A sensitivity analysis was subsequently done by these entities to provide additional information for the Board of Natural Resources, the policy-making body that will ultimately decide whether the HCP is in the interests of the trusts. In addition, Foster Wheeler performed a decision analysis that looked at the likely occurrence of future regulatory constraints that would govern DNR forest land management.

XII. PUBLIC INVOLVEMENT

Summary: Five organizations and five individuals provided comments on public involvement. NWIFC has concerns that the monitoring plan does not require review or consultation by the Tribes, public or other stakeholders. A general request was made that Tribal staff be involved in development of any implementation or monitoring plan. NWIFC commented that there is no provision in the IA to provide additional public comment and review should additional species be included in the HCP. The Squaxin Tribe would like clarification of the implementation proceedings of this plan with the Tribes. GBA Forestry, Inc. asked for a formal agreement between DNR and Washington Hardwoods Commission to allow the commission to participate in future policy decisions affecting the hardwood resource. Washington Hardwoods Commission also requested the ability to provide input on implementation of the HCP. Three individuals asserted that the public should have the right to comment on any major amendments. Another person asked for public comment and peer review of the as-yet incomplete conservation plan for murrelets. One person asked for another public hearing on the HCP after the FEIS is complete, but before it is submitted for final

approval. Metropolitan King County Council thanked DNR for additional clarifications, information, and an ongoing forum for discussion.

Response: Public-involvement concerns regarding coordination of implementation with the Tribes will be taken up by DNR with the Tribes directly. Additionally, the Services will continue to discuss implementation with the Tribes in compliance with the Services' Trust responsibilities to the Tribes. As mentioned above, all amendments to the permit and HCP will be subject to the appropriate level of public review and involvement. The matter of subsequent agreements between DNR and private entities seeking access to policy making is outside the scope of this action and should be taken up with DNR directly. Public hearings following release of the FEIS are not required. Any future peer review will be conducted where required and according to the Services' policy on peer review. Compliments regarding the public process conducted so far, are noted.

A. PUBLIC INPUT

Summary: The Squaxin Island Tribe, NWIFC, the Washington Hardwoods Commission, the Society for Conservation Biology, The Mountaineers, an independent forester, and three individuals commented on public input.

Seven commentors wanted more conservation, saying: (1) The IA should have a provision for public input on adding previously unlisted species; (2) A science advisory board should participate in periodic plan reviews to provide public access to review of monitoring and research; (3) The long-term marbled murrelet conservation strategy should go through the NEPA and/or SEPA process, including a 60-day comment period; and, (4) The public should be able to comment on future amendments to the HCP (two commentors) involving more than $500,000 in 1996 dollars in timber or nontimber values (one commentor). Concerns raised by commentors included: (1) The long-term marbled murrelet conservation strategy should go through public and/or peer review; (2) A formal agreement should establish a mechanism for the Washington Hardwoods Commission to participate; (3) The hardwoods industry questioned whether it will have input into policy and implementation; and (4) There should be another public hearing before the legislators are involved.

Response: Amendments will go through NEPA review, as well as SEPA review, when and if appropriate. The issue at the time will determine the level of NEPA/SEPA response and public review. However, DNR and the Services will continue their informal workings with all stakeholders. The Services will analyze all amendments beyond minor corrections and edits to determine the need for, and the appropriate level of, NEPA compliance.

B. COORDINATION

1. Tribes

Summary: The Hoh Indian Tribe, the Lower Elwha S'Klallam Tribe, the Muckleshoot Indian Tribe, the Point No Point Treaty Council, the Squaxin Island Tribe, the Tulalip Tribes, and NWIFC provided comments on coordination with the Tribes.

Five commentors wanted more conservation, saying: (1) the Tribes expect to be consulted and participate in implementation of the HCP (four commentors), including research

proposals impacting Treaty rights and the site-specific riparian management process; (2) The Squaxin Island Tribe cannot fully support the HCP without a formal understanding as to the relationship between the Tribe and DNR; and (3) the Tulalip Tribes requested government-to-government meetings with the Services to address policy and process issues, and with the Services and DNR to resolve technical issues. Concerns raised included involvement in implementation and status reviews of the plan (two commentors) and USFWS working with the Muckleshoot Tribe to develop an implementation plan before issuing the FEIS. The Hoh Tribe stated that it understands and appreciates that its agreements with DNR will be carried out under the HCP.

Response: The Services will continue to coordinate with the Tribes according to the federal trust relationship previously discussed under trust responsibilities to Tribes. DNR is committed to the intent of the Washington State Centennial Accord and the department's tribal policy to consider the joint needs of the Tribes, as well as the responsibilities of the state to provide for the trust beneficiaries. DNR and the Services will also continue to participate in the long-standing Timber, Fish, and Wildlife process with the Tribes. In addition, DNR's Regions will be administering the HCP at the local level, which will allow the Tribes to work directly with the local managers.

2. Adjacent Land Manager Coordination

Summary: NCASI recommended coordinating research projects for the spotted owl in the OESF with projects across the owl's geographic range.

Response: DNR is involved with others in ongoing cooperative research projects. The HCP has the potential for joint research with others, including the Olympic Natural Resource Center. However, this is not a commitment or requirement of the HCP. DNR will encourage the publication of research results from projects undertaken in the OESF or elsewhere on state trust lands covered by the HCP.

XIII. NEPA/SEPA COMMENTS

Summary: The USEPA commented the DEIS represents a commendable effort. The Hoh Tribe asked if SEPA would still prevail on state lands. Bogle & Gates (a consultant to Washington State University) asked if DNR would initiate the EIS process for each new plan and guideline. The Black Hills and Tahoma Audubon chapters, Northwest Ecosystem Alliance, and one individual commented NEPA should be repeated when DNR completes its long-term murrelet plan.

Response: The Services and DNR thank those commentors that complimented the environmental document. None of the document comprising the application affect DNR's continuing legal requirement to comply with SEPA. The DEIS was prepared to serve simultaneously as an NEPA document for the proposed action of issuing an ITP and as a programmatic SEPA document for the Board of Natural Resources proposed action of adopting an HCP to support the issuance of an ITP. An appropriate level of analysis, review, and comment will occur for all major amendments to the proposed action.

A. RANGE OF ALTERNATIVES

Summary: Washington DOE and five individuals commented either Alternative B or C was acceptable. WDOE encouraged adoption of Alternative C. Two individuals asserted that modifications for greater species protection would be necessary for Alternative B to be acceptable. The Point No Point Treaty Council, Squaxin Island Tribe, Yakama Indian Nation, Rivers Council of Washington, Sierra Club Cascade Chapter, Washington Wilderness Coalition, The Mountaineers, Skagit and Whidbey Audubon chapters, and four other individuals supported Alternative C. One individual would support C only if incidental take is not allowed. Nine commentors supported Alternative A, and two individuals supported Alternative B. NWIFC commented that all alternatives should include the entire range of the northern spotted owl and an alternative proposing a transition from a zoned to an unzoned management strategy in the OESF should have been analyzed. Bogle & Gates (a consultant to Washington State University) commented at least three of the alternatives not analyzed in detail were reasonable and should have been analyzed in detail. Green Crow, a forest products company, and another individual suggested DNR use the Forest Resources Plan as an alternative. Another individual asked that all three alternatives be rejected and a new alternative presented which is in compliance with the ESA. One individual requested a comparison between Alternatives B and C. Another commentor wrote that current Forest Practice Rules and Regulations should have been analyzed as an alternative.

Response: The Services note all comments suggesting the choice of a preferred alternative. The Services have not identified a preferred alternative at this time. As for comments suggesting that all alternatives should address the entire range of the owl, as opposed to the presently analyzed plan area, please see responses in topics regarding the design of the plan area.

As for comments regarding the alternatives not analyzed in detail, the DEIS rigorously explores and objectively evaluates all reasonable alternatives and briefly discusses the reasons underlying the decision not to analyze certain alternatives in detail (40 CFR 1502.14 (a)). The Services are not required to analyze alternatives in detail that do not comport with the Purpose and Need stated in Chapter 1 of the DEIS. The Council on Environmental Quality (CEQ) has written, "[t]here is no need to disregard the Applicant's purposes and needs and the common sense realities of a given situation in the development of alternatives" (Federal Register, 48 FR 34263). Further, the Services adhere to the sentiments expressed by the court in Resident in Protest--I35 v. Dole, 583 F. Supp. 660-61 (D. Minn., 1984): "A reasonable alternative is one which would effectuate the purposes of the project. If an alternative does not implement the purposes of the project it certainly is not reasonable and no purpose is served by requiring a detailed discussion of its environmental effects since the alternative would never be adopted." Based on its analysis that certain alternatives considered would not effectuate the purpose and needs stated in the DEIS, DNR appropriately informed the Services it would not implement those alternatives if analyzed and selected. Using the common sense approach suggested in CEQ's guidance and in Residents, the Services and DNR eliminated certain alternatives from detailed analysis.

The suggestion that the Services analyze an alternative based on "splitting the difference" between the proposed HCP Alternative and the No Action alternative is an arbitrary suggestion in view of how the action alternatived were developed. The alternatives and HCP

prescriptions that were analyzed in detail were developed through reliance on current science and best available information applicable to habitat management in the context of commodity production. The Services must avoid arbitrariness in implementing the Section 10 process.

Aspects of the Forest Resource Plan that are currently a part of DNR management and operations under the present regime of regulations are incorporated into the description of the No Action alternative. The FPRs have been incorporated into the description of the No Action alternative to the extent that current agency forest practices guide current operations and management. However, as discussed elsewhere in this section, an alternative based entirely on implementing forest practices minimums would not have enabled issuance of the requested ITP.

All three alternatives considered "comply" with the ESA. The question of whether any of the Action proposals enables the Services to make the findings stated in ESA Section 10(a)(2)(B) has yet to be answered.

NEPA demands analysis of the "net" effects of an action proposal on the human environment. This assessment involves comparing the increment of effects between the various action proposals and the No Action alternative. As a result, the action proposals have not been compared to each other.

B. REASONABLE ALTERNATIVES

Summary:,Bogle & Gates (a consultant to Washington State University) commented that DNR's definition of the No Action alternative implies that there are no other alternatives to an HCP. The Northwest Forestry Association commented that other alternatives to an HCP need to be developed and analyzed.

Response: Environmental documents prepared to analyze ITP issuance have generally described the No Action alternative the same way. Specifically, the No Action alternative represents the regulatory regime with which the applicant would comply in the absence of obtaining an ITP. Generally, for nonfederal forest land managers this means complying with state forestry regulations and complying with the ESA prohibition of the take of listed species. The No Action alternative presented in the DEIS is somewhat different in that DNR has been implementing its own Forest Resource Plan, rather than merely adhering to the prevailing regulatory regime. Accordingly, for DNR, "no action" has been taken to mean "no change" from the present mode of management. Since "no change" in the context of issuing an ITP comports with the definition of no action under NEPA implementing regulations and guidance, the Services utilized this definition of no action in the DEIS.

The Services respectfully disagree that the description of the No Action alternative implies that there are no alternatives to an HCP. DNR does not have to do an HCP as a means of compliance with the ESA. In the absence of acquiring an ITP and implementing an HCP, DNR could continue its present mode of operations. The No Action alternative description takes into account the regulatory environment under which DNR would have to operate without an ITP, nothing more.

C. NO ACTION ALTERNATIVE

Summary: The Washington DOE recommended against selecting the No Action alternative because it does not adequately protect salmon habitat nor address amphibian needs. Bogle & Gates (a consultant to Washington State University) commented the DEIS prejudices decisionmakers against the No-Action alternative because it leads them to the conclusion that one of the action alternatives is the only reasonable choice for managing State land. Bogle & Gates also commented that the No Action alternative does not afford the trust any meaningful degree of certainty. Clallam County, Washington Hardwoods Commission, and Washington Forest Protection Association wrote that the presentation of the No Action alternative was inaccurate and/or did not present the correct baseline for analysis. The Sierra Club Cascade Chapter commented the NoAction alternative does not adequately provide for fish and wildlife, especially those requiring late successional forest conditions. One individual stated the No Action alternative represents a "known violation" of the ESA.

Response: The Services and DNR note Washington DOE's concern for the lack of protection for certain species in the No Action alternative. Regarding Bogle & Gates' comments, the DEIS fulfills a basic NEPA role by analyzing in detail the increment of effects to a wide range of resources between no action (not issuing an ITP, not implementing an HCP) and the two action alternatives. The document makes no assessment of the propriety of any choice for management of State lands. In fact, the Services have purposefully deferred identifying the preferred and environmentally preferred alternatives in the DEIS.

The Services acknowledge the commentor's assessment that the No Action alterative probably provides the state's land managers with the lowest degree of planning certainty of the proposals analyzed.

The No Action alternative provides the baseline NEPA demands for analysis of an HCP proposal. The action proposal is the issuance of the ITP. The No Action alternative, then, is not issuing an ITP. No HCP would be implemented and no take of listed species would be permitted. DNR would be subject to management restrictions for currently listed species and regulations promulgated after future species listings without the benefit of an agreement providing a mechanism for adding those species to the requested permit. DNR would be required to engage measures to avoid take of listed species.

The Services provisionally agree with the assessment that the No Action alternative does not adequately provide for fish and wildlife species dependent on late-successional forests. The Services are not certain what the commenter meant by a "known violation" of the ESA. The Services disagree that operating under no action would violate the ESA. As described above, and elaborated in the EIS, under the No Action alternative DNR would have to comply with individual species take prohibitions as well as other applicable forest practices rules and regulations.

D. COMMENT PERIOD LENGTH

Summary: Skamania County commented the comment period was inadequate to review the DEIS, HCP, and IA. Skamania County reserved their ability to submit additional comments in the future. The Mountaineers, Wildlife Society, and Northwest Biodiversity Center, Merrill

& Ring and Northwest Forestry Association, and four individuals all suggested the period for review was too short.

Response: The HCP has been available for public review since March 1996. The DEIS was available for review for a 60-day period, exceeding the statutory review period length and comporting with Department of the Interior policy.

E. ADEQUACY OF DOCUMENTS

Summary: The Hoh Tribe requested a comparison of the OESF proposal with current state policy. The Muckleshoot Indian Tribe requested the draft HCP and DEIS be evaluated in relation to SEPA to address site-specific issues and cumulative effects. The Tulalip Tribes stated the Tribes need more input in the DEIS. Point No Point Treaty Council asked that the DEIS evaluate treaty resources under each alternative. Clallam County Commissioner Phillip Kitchell wrote that a report by Lippke, Sessions, and Carey should be used to provide "accurate information" to the Board of Natural Resources . One commentor was impressed by the effort and thoroughness of the DEIS, another felt that the DEIS doesn't fully describe the impacts of the HCP. A third individual requested a clearer comparison of Alternatives B and C. Bogle & Gates (a consultant to Washington State University) wrote that the environmental document does not provide sufficient information to allow informed decision making by the responsible officials. Black Hills and National Audubon Societies, Rivers Council of Washington, and the Sierra Club Cascade Chapter suggested an enhanced all-species analysis. The Wildlife Society commented a population viability analysis for spotted owls affected by take is necessary. The Washington Hardwood Commission and GBA Forestry , Inc. stated that the impact to hardwood habitats and harvest rates needs to be clearly defined under each alternative.

Response: The No Action alternative describes that scenario in which DNR continues to operate without an ITP. The No Action alternative is intended to reflect DNR's present mode of operating. Therefore, the comparison of the OESF action proposal to the No Action alternative provides the comparison that the Hoh Tribe seeks.

The DEIS fulfills the Services' NEPA documentary responsibility as well as DNR's SEPA responsibility. Since the environmental documents are programmatic in scope, site-specific issues are not analyzed. On the other hand, cumulative effects of the proposed action (ITP issuance) are considered in the DEIS.

The issue of treaty resources is addressed under the topic heading Trust Responsibilities and Treaty Resources in this section of the FEIS. The Services caution readers that here, we are referring to the Trust Responsibility owed by the federal government to Indian Tribes regarding treaty resources.

The Services are unaware of whether the Board of Natural Resources has made use of the Lippke report. In evaluating the impacts of the proposed action on the human environment, the Services and DNR are constrained to make use of the environmental documents described in those statutes and therefore relied on the DEIS, as presented.

As for comparing Alternatives B and C, NEPA requires a presentation of net impacts of a proposed action. Net effects are described in the DEIS by comparing the action alternatives to the baseline of effects expected under the No Action alternative. Environmental documents typically compare a range of reasonable action alternatives to a no action alternative. This comparison was presented in the DEIS. Furthermore, the DEIS presents information that has been typically required for decision making by responsible officials on other HCP proposals for forested land in the Pacific Northwest.

The use of habitat-based associations to assess the effects of the proposed action on certain unlisted species follows the approach used in previous HCPs that address unlisted species. An in-depth analysis covering effects of permitting the take of owls based on jeopardy parameters (whether the proposal appreciably reduces the likelihood the species will survive and recover in the wild) is to be presented in the USFWS' Section 7 Biological Opinion. The harvest projections that were generated to conduct several of the analyses presented in the DEIS did not differentiate species.

F. SUPPLEMENTAL EIS

Summary: Bogle & Gates (a consultant to Washington State University) asked whether future negotiations with federal agencies would require supplemental EISs. WEC commented that a Supplemental EIS (SEIS) should be prepared when the long-term murrelet plan is complete.

Response: The Services note that a SEIS shall be prepared if the agency makes substantial changes in the proposed action that are relevant to environmental concerns or there are significant new circumstances or information relevant to environmental concerns (40 CFR 1508.25). At this time, neither of these two criteria has been triggered, and no need for a SEIS has arisen to date. Negotiations regarding the HCP proposal have ensued following the receipt and review of public comment. The HCP has been finalized in accord with these discussions. Subsequently the FEIS was prepared in compliance with the agencies' responsibilities under NEPA and SEPA. As mentioned above, all major amendments will be subject to the appropriate level of analysis, review, and comment.

G. SCIENTIFIC CREDIBILITY

Summary: Five organizations and two individuals provided comments on scientific credibility. The Muckleshoot Tribe commented that there is no technical basis for the separate recommendations for the OESF. NWIFC stated that much of the HCP lacks credibility. The Tulalip Tribes repeatedly questioned the scientific foundation for the technical issues on which they commented. Bogle & Gates (a consultant to Washington State University) commented that speculative, unfounded statements are not scientific and mislead the decision maker, especially regarding riparian and wetland management under the No Action alternative. WEC commented the HCP should be based on the best available science. One individual wrote the HCP is deceptive and self serving. Another individual commented the document contains numerous contradictions, distortions, and conclusions which disregard existing science.

Response: The OESF warrants a different approach than the other planning units because of its geologic, climatic, and experimental nature. The HCP's foundation in science began with

the creation of a science team and continued through discussion and incorporation of the best available scientific information. This approach was applied to each topic scrutinized by the Services and DNR technical staff.

H. CUMULATIVE IMPACTS

Summary: WEC noted that because the HCP encompasses a large area, cumulative effects to species would be great if the HCP provides only marginal protection. WEC also wrote that, DNR, as a state agency, has a higher obligation to protect species than a private landowner. The Muckleshoot Indian Tribe wrote the analysis of salmonid impacts fails to consider impacts from other sources.

Response: NEPA requires the Services to analyze the cumulative effects of the proposed action. Cumulative effects are defined in NEPA regulations as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). The required analysis appears in Section 4.11 of the DEIS.

This proposal involves the issuance of a permit to allow take of species listed under the ESA. For such a permit to be issued, the applicant must propose a plan designed to adequately mitigate the effects of take. The present HCP is an example of such a plan. Mitigation is provided, not just for the species which might be taken but also for effects on many other aspects of the human environment. In this regard, the Services view implementing an adequate HCP as providing many beneficial effects, as opposed to adverse effects, on the human environment. Therefore, an HCP proponent makes little or no contribution to overall cumulative effects, especially when compared to other landowners in the vicinity that are managing to lower standards. The bottom line remains -- other landowners continue to make the same level of contribution to cumulative impacts, while the HCP proponent implements improved management, thus lowering overall cumulative effects compared to what might occur in the absence of the proposed HCP.

Concerning the assertion that DNR has a higher reponsibility to fish and wildlife conservation than other nonfederal landowners, no distinction is made in ESA Section 10 regarding the stature of the landowner when considering the criteria for permit issuance, and no such prejudice has been accorded DNR in the present process.

XIV. APPROVAL/DISAPPROVAL

A. SECTION 7 CONSULTATION

Summary: The Muckleshoot Indian Tribe stated that the HCP and DEIS are incomplete without a cumulative effects analysis that considers the relationship of DNR's HCP to other plans and actions for areas that are adjacent to DNR's HCP planning areas.

One individual expressed his belief that the Service should solicit public comments on draft biological opinions and provide public access to all documents used in all consultations. Another individual provided a detailed analysis of why the owl provisions of the draft HCP

violate section 7 of the ESA. He determined that: (1) The HCP did not use the best available scientific data; (2)The HCP and EIS did not accurately depict the "impact that would result from such taking"; (3)The HCP would appreciably reduce the likelihood of the survival and recovery of the species in the wild; (4) The HCP does not minimize or "to the maximum extent practicable" mitigate any and all impacts that may occur upon the endangered species and its critical habitat; and, (5) Other reasonable and prudent alternatives are available which would provide a greater benefit consistent with conserving the species or its critical habitat.

Response: This analysis will be conducted in the USFWS' Section 7 Biological Opinion for listed species. Future federal actions are not considered during Section 7 consultation. However, reasonably foreseeable federal actions are included in cumulative analyses conducted for NEPA purposes. A complete cumulative analysis was included in the DEIS.

The Services do not usually seek public input on draft biological opinions but do rely on professional judgement of its scientific experts. In addition, all documents and information used in the consultation are available to the public upon request. DNR utilized a science team composed of some of the most knowledgeable scientists in their fields and utilized their recommendations for a majority of the conservation strategies. The Services will utilize the best data available in conducting its consultation. The HCP did depict the impact that would result from such taking, but the Services will make an independant finding in this regard, as well as whether the taking would result in jeopardy. The Service notes that whether the take has been minimized and mitigated to the maximum extent practicable is a Section 10 finding and refers the reader to those responses. Similarly, the Service notes that an analysis of other alternatives is required as a component of an HCP and for NEPA purposes, but is not a Section 7 requirement unless necessary to avoid jeopardy.

1. Impact of Take (Also refer to Section 7 Consultation, above.)

Summary: WDFW proposed a take schedule to reduce the amount and impact of take of northern spotted owls. Several commentors made various assertions regarding the amount of take for owls; these varied from 81 to 187 sites.

Response: The Service will complete a thorough assessment of estimated take, as well as the impact of that take, for each listed species with the potential to be affected by permit issuance and HCP implementation. The Services agree that prioritizing owl sites in order of importance and scheduling take would be an effective manner to provide additional conservation at little or no cost to DNR and its trusts. The Services will continue to provide technical assistance in this regard throughout the first decade of implementation.

2. Critical Habitat

Summary: Washington State Representative Mark Schoesler, 9th District, asked for clarification of the ramifications of an HCP creating a federal nexus: Could this trigger consideration of critical habitat designations? One individual commented that because of uncertainty and lack of knowledge, more than the minimum amount of habitat necessary for species survival should be maintained for their benefit. The NWIFC stated that under the provisions of the unlisted species agreement there is no assurance that the management standards put into place by DNR pursuant to the HCP would be consistent with critical habitat designations for the newly listed species. This failure to require

amendment of management practices in light of new knowledge is especially significant when both DNR and regulatory agencies acknowledge a limited understanding of species' habitat needs. Bogle & Gates (a consultant to Washington State University) wrote that excluding critical habitat designation from the HCP area may prove unlawful. Bogle & Gates point to 16 U.S.C. § 1536(a)(4), which requires federal agencies to ensure that their actions do not result in destruction or adverse modification of critical habitat. It may prove very difficult to argue that any habitat modification under an HCP is not adverse. Consequently, subsequent exemptions of HCP lands from already designated critical habitat will be vulnerable to legal challenge. Bogle & Gates also note that the no adverse modification standard is more stringent than the jeopardy standard.

Response: The Service has designated critical habitat for owls and murrelets within western Washington. The adequacy of those designations was addressed at the time. For additional information regarding marbled murrelet critical habitat, refer to the May 24, 1996, Federal Register (61 FR 26225). For additional information regarding northern spotted owl critical habitat, refer to the January 15, 1992, Federal Register (57 FR 1796).

The HCP will be assessed in the Section 7 consultation for effects the HCP will have on critical habitat and critical habitat constituent elements. If the proposed HCP would result in adverse modification, the permit would not be issued and the HCP would not be implemented. However, such analysis will assess the value of habitats to be harvested or otherwise impacted as well as the conservation benefits to be derived from the HCP. Lastly, the NWIFC is correct. Once approved, the unlisted species agreement may result in a species being added to the permit based upon an HCP which is not consistent with the designation of critical habitat which might follow that future listing. However, the conservation benefits which may be derived from such unlisted species agreements may cumulatively preclude the need for future listing or designation of critical habitat. Designation of critical habitat can be based upon a number of factors which include threats to the subject habitat and economic impacts. Habitats provided under an HCP would be subject to a different (most likely lower) level of threat than other lands and might be precluded from designation from the outset.

3. Jeopardy Level

Summary: One individual commented that because of uncertainty and lack of knowledge, more than the minimum of habitat necessary for species survival should be maintained for their benefit. One commentor said the measurement standard for jeopardy should be clarified.

Response: The Services agree with the first commentor. Regarding the second comment, the jeopardy "standard" is clearly stated in the implementing regulations. It's applicability is more difficult to translate from a conceptual definition to specific levels of biological impact for a given species.

B. SECTION 10 ISSUANCE CRITERIA

Summary: The Services received comments from two Tribal groups, three conservation organizations, and two individuals on issuance criteria. The Tulalip Tribes and Point No Point Treaty Council wrote that ITP issuance criteria are superseded by the Government's

Trust Doctrine related responsibilities regarding resources covered by treaty. The Northwest Ecosystem Alliance believed the HCP does not adequately protect listed or unlisted species and that all alternatives violate the ESA. The Washington Native Plant Society wrote that the HCP needs to consider plants in order to meet the requirement of the ESA, Section 10(a)(1)(b). The Mountaineers wrote the proposed HCP Alternative violates the ESA because it puts more than 40 percent of the known and projected spotted owl sites at risk. One commentor wrote the HCP was not in compliance with the ESA. Another individual commented recovery for threatened and endangered species is an issuance criteria.

Response: Incidental Take Issuance Criteria are stated in ESA Section 10(a)(2)(B) at 50 CFR 17.22(b)(2) and 50 CFR 17.32(b)(2). They are incorporated here by reference. Many of the comments provided during the public review process included assertions that the HCP proposals "violated" or at least did not meet the Issuance Criteria. A decision has yet to be made in this regard. The decision to issue a permit as requested depends inextricably on the permit applicant meeting the criteria stated. To issue an ITP, the responsible official will have to find:

- Take is incidental. (Defined as -- incidental to and not the purpose of the carrying out of an otherwise lawful activity.

- The effects of Take are minimized and mitigated to the maximum extent practicable. (The applicant would, to the maximum extent practicable, minimize and mitigate the impacts of such taking.)

- Adequate funding is assured. (The Applicant would ensure that adequate funding for the HCP would be provided. The implementing regulations add: "and procedures to deal with unforeseen circumstances would be provided." The handling of unforeseen circumstances in the present proposed action is founded on written policy of the Departments of the Interior and Commerce. Unforeseen circumstances are discussed on page 3-158.)

- There is no jeopardy. (The taking would not appreciably reduce the likelihood of the survival and recovery of the species in the wild. This is a restatement of the jeopardy sandard also found in ESA Section 7.)

- Other measures will be implemented. (The Services must be assured that other measures will be implemented.)

The Services agree that the federal government's Trust Responsibility to the Tribes requires the federal government to consider and analyze the effects on certain resources that may be impacted by the proposed action. Responses to comments on that specific topic are provided elsewhere in this appendix. Nothing in this proposed plan is intended to limit or diminish the legal obligation and responsibility of the Services as agencies of the federal government.

The Services disagree with the interpretation that the context of relations under the Federal Trust Responsibility alters the criteria on which permits are issued. The Services believe the goals of ESA Section 10 and the Trust responsibilty owed the tribes by the federal government are compatible. The Tribes should be assured, as was presented to member Tribes at the

NWIFC Conference Center on June 12, 1996, that the Services have become acutely aware of the concerns of the Tribes regarding treaty resources. In that regard, the Services will comply with their responsibility under the federal Trust Doctrine to consider the effects of this and every action proposal on treaty-covered resources and continue to consult with the Tribes on these issues.

1. Incidental Take

Summary: The Services received one comment relating to incidental take as a permit issuance criteria. The Northwest Forestry Association asked that the Sweet Home Chapter of Communities for a Greater Oregon v. Babbitt decision as it applies to take in this HCP should be included in the document.

Response: Incidental Take is defined as take incidental to and not the purpose of the carrying out of an otherwise lawful activity (ESA Section 10(a)(2)(B), 50 CFR 17.22(b)(2) and 17.32(b)(2)). The Sweet Home case did not address incidental take. The Sweet Home case addressed the definition of prohibited "take" as suggested in the comment. The Sweet Home case upheld the ability of the Secretary of the Interior to issue regulations, such as the one that defines take of listed species. Accordingly, the Supreme Court of the United States upheld the present definition of take as that term is defined in ESA Section 3(18) and its accompanying regulations in 50 CFR 13 and 17.

2. Minimize and Mitigate

Summary: NWIFC questioned whether DNR could terminate the agreement early without adequately mitigating take that has occurred to that point in time. Northwest Ecosystem Alliance, WEC, and one individual wrote the HCP does not satisfy this issuance criterion. Washington Wilderness Coalition commented that Alternative C represents the greatest mitigation of the impacts of taking. A local group commented that Alternative B does not offer sufficient mitigation to justify issuance of an ITP.

Response: The question of an HCP proponent terminating early after incurring a "mitigation debt" has been raised for other HCPs. Pursuant to the IA, early termination by DNR is subject to the permit condition requiring that any past incidental take has been sufficiently mitigated by compensation measures implemented prior to termination. While the matter may be referred to Alternative Dispute Resolution, the Services may, at any time, utilize remedies available to enforce this permit condition. Such remedies may include enforcing provisions of the HCP until the subject mitigation debt is paid. As to the suggestions that the proposal does not minimize and mitigate the effects of take to the maximum extent practicable, a determination has yet to be made. The Services will assess each species, or group of species, or habitat type, to ensure that the impacts of take are minimized and mitigated to the maximum extent practicable prior to issuing any permit or entering into any unlisted species agreement.

3. Funding

Summary: WDFW asked if DNR will move funds around to cover budget shortfalls and for more details on how adequate funding for the HCP will be provided. WEC questions whether DNR can make the assurance that funding to implement the HCP will be available.

Response: Funding is discussed in the Implementation Agreement. To issue an ITP, the Services must be assured the applicant will adequately fund implementation of the proposed HCP. In the event that DNR is not appropriated sufficient funds to implement the HCP, the IA provides that the Services may suspend or revoke the permit.

4. Jeopardy

Summary: One individual commented that because of uncertainty and lack of knowledge, more than the minimum of habitat necessary for species survival should be maintained for their benefit. One commentor wrote that the measurement standard for jeopardy should be clarified.

Response: The jeopardy standard is defined in both Section 7 and Section 10 of the ESA and restated in the response to comments on ESA Section 10 Permit Issuance Criteria topic, (Section XIV B, above). No permit will be issued for a species that would be jeopardized by the proposed action.

C. DNR DECISION CRITERIA

Summary: State Representative Schoesser, the Washington State Association of Counties, Bogle & Gates (a consultant to Washington State University), Northwest Forestry Association, Washington Hardwoods Commission, The Mountaineers, two wood products companies, and five individuals commented on various aspects of the decision process. The state legislator stated that it is vitally important that questions and concerns from trust beneficiaries, elected officials, key stakeholders, and citizens are answered and abated before a final decision is made. The Washington State Association of Counties said that the HCP should meet the objectives of predictability and continuity. Bogle & Gates claimed that the Draft EIS did not provide adequate information for decision makers and was biased against Alternative A. An individual stated that the draft HCP lacked flexibility, and another individual said that the draft HCP offers certainty. A wood products company asserted that the information necessary to justify the decision, such as economic impacts to beneficiaries and benefits to fish of wider riparian buffers, is not yet available. The Washington Hardwoods Commission and another wood products company asked that other studies be considered before a decision is made. The Mountaineers suggested, given the complexity of the undertaking, it is good idea to delay approval in order to carefully consider the whole process. An individual urged that the Board of Natural Resources not to delay its decision, but to make the decision on the basis of what is known at this time. One individual expressed concern about what parties or interest groups might influence the Board in their decision.

Response: The decision process has been, and will continue to be, in compliance with the requirements of NEPA and SEPA and other state laws and regulations which govern decisions made by the Board of Natural Resources. Two important reasons for these laws and regulations are: (1) open disclosue and dissemination of information regarding government actions affecting public resources; and, (2) citizen participation in the decision making process. DNR and the Services have provided many means (public meetings, public hearings, solicitation of public comments, and meetings of the Board of Natural Resources) for citizens, including elected officials and stakeholders, to ask questions and state their concerns. Special requests for information have been responded to by DNR and/or the Services. DNR has already published a preliminary draft HCP, a draft HCP, and a Draft EIS, and has made other

documents available to the public at meetings of the Board. Members of DNR's HCP management team have met with trust beneficiaries and stakeholders to answer their questions and address their concerns.

DNR believes that its HCP and Implementation Agreement provide predictability, continuity, flexibility, and certainty. These qualities are the foremost reasons motiviating DNR and other land managers in Washington state to enter into contractual agreements with the Services. These qualities are important factors that the Board will consider when making its decision.

DNR and the Services do not agree that the Draft EIS did not provide adequate information for decision makers and was biased against Alternative A. All important potential environmental, economic and social effects of the alternatives were addressed in the Draft EIS. The effects of the alternatives on revenue to the trusts were reported in a separate document that was distributed at a Board meeting and is available to the public. Such a report is not appropriate for an EIS. To eliminate potential biases, whenever possible the comparision of alternatives in the Draft EIS and reports to the trusts was based on an objective quantitative analysis of the alternatives.

Admittedly, there is much that scientists do not know about the management of ecosystems. Decisions regarding the management of natural resources are often difficult and complex and often must be made with imprecise or incomplete knowledge. DNR and the Services have collected the best available relevant scientific information to develop and assess DNR's HCP. The Board is carefully considering the information presented to them.

XV. MISCELLANEOUS COMMENTS

A. HCP LANGUAGE, LOOPHOLES, VAGARIES, AND TYPOGRAPHICAL ERRORS

Summary: Bogle & Gates (a consultant to Washington State University), the Muckleshoot Indian Tribe, NWIFC, Sierra Club Cascade Chapter, Environmental Resource Center, the National Audubon Society and two chapters, the Rivers Council of Washington, and nine individuals wrote that the HCP is compromised by non-committal language and/or "loopholes." Northwest Forestry Association commented that language such as "we hypothesize" or "it is difficult to predict" needs clarification, that quantifiable estimates of silvicultural practices should be made for the OESF, and that silvicultural/operational research is necessary to achieve biological goals. NWIFC recommended rewriting the portion of Chapter V of the draft HCP regarding research. They stated the research objectives, as currently written, are vague and a bit redundant. The Clallam County Commissioner suggested replacing the words "Nolan Creek" with "Goodman Creek" in the title of the "Hoh Agreement" on page IV.115 of the draft HCP. WEC said that vague language should not count as mitigation. The Washington Forest Protection Association suggested changing the word "extraction" to "production". An individual also provided lengthy editorial comments. An individual member of the Blue Ribbon Coalition suggested the first sentence of the Public Use subsection on page IV.171 of the draft HCP, should refer to DNR management of "public lands".

Response: Clarifying language has been added to Chapter V of the draft HCP. Some research objectives have been reworded to provide additional clarity. Restructuring the title of the "Hoh Agreement", as the commentor suggests, is not warranted as it would be incorrect.

During the course of preparation of the FEIS, the Services and DNR have focused their attention on addressing substantive issues, but agree that typographical errors and ambiguity can create difficulties with comprehensibility of any written material. Where possible, the Services have corrected errors and provided less ambiguous language. The document writers believe the descriptions of certain lands in the document by the designations used therein is standard and does not warrant revision.

With respect to commentors suggesting commitments have been vaguely or ambiguously described in the DEIS, the Services note the HCP applicants desire certain amounts of flexiblity with respect to the commitments they make in HCPs. However, commentors should be assured that all commitments made in an HCP are contractual and compliance with these commitments are conditions for permit issuance. Accordingly, noncompliance with those commitments can result in permit suspension or revocation or any of the other remedies provided in the ESA and its implementing regulations. Finally, as to any activity described as applicable, it is entirely at the discretion of the applicant (for example, as to placement, timing, and amount of mitigation) and will not be considered by the Services in assessing the application nor in making findings under Section 10(a)(2)(B) of the ESA.

B. STATE REGULATIONS

Summary: The Washington State Association of Counties, Northwest Forestry Association, Washington Forest Protection Association, Washington Hardwoods Commission, seven other representatives of the timber industry, and nine individuals presented concerns related to state regulations. The majority of comments pertained to Washington Forest Practices Rules for riparian management zones. The Washington State Association of Counties stated that one objective of the HCP should be "minimum Forest Practice Board regulations." Northwest Forestry Association suggested that Washington Forest Practices Rules be considered as an alternative. The Washington Hardwoods Commission, Washington Forest Protection Association, and several other representatives of the timber industry stated that the Forest Practices Rules provide adequate protection for fish and wildlife and requested that DNR not increase the level of protection in its HCP. Several representatives of the timber industry were concerned that the riparian conservation strategy described in the draft HCP might influence the Washington Forest Practices Rules and lead to stricter requirements for the protection of riparian areas on private land. One individual asked that funding be increased for enforcement of regulations, and another suggested that DNR switch to cooperative best management practices. Northwest Ecosystem Alliance said that the draft HCP fails to meet state requirements to "ensure the continued long-term existence, distribution and protection of listed species."

Response: The HCP is the principle document supporting DNR's application for incidental take permits and unlisted species agreements. The Services can issue incidental take permits and unlisted species agreements if, and only if, the HCP satisfies the criteria listed in Section 10 of the ESA. Early in the development of DNR's HCP, the Services informed DNR that an HCP Alternative premised entirely on minimum practices described in the current Washington

Forest Practices Regulations would be insufficient to enable the findings necessary for ITP issuance and unlisted species agreements.

It is the responsibility of the Washington Forest Practics Board to determine what regulations are necessary to afford protection to forest soils, fisheries, wildlife, water quantity and quality, air quality, recreation, and scenic beauty coincident with the maintenance of a viable forest products industry. Funding for the enforcement of forest practices regulations is beyond the scope of the proposed action.

C. WASHINGTON FOREST PRACTICES RULES WATERSHED ANALYSIS

Summary: NCASI and the Washington Forest Protection Association were disappointed that watershed analysis was not used for the draft HCP's riparian conservation strategy. An individual asked that DNR acknowledge that watershed analysis will be performed on almost all DNR-managed lands during the course of the agreement. Bogle & Gates (a consultant to Washington State University) said that a major omission of the draft HCP and Draft EIS was a meaningful analysis of the role of Watershed Analysis under Alternative A.

Response: For some purposes, in particular hydrology, Washington Forest Practices Rules Watershed Analysis is thought to provide adequate protection of public resources. For other purposes, in particular wildlife conservation, the Watershed Analysis process is clearly inadequate. There is no module for wildlife in Washington Forest Practices Rules Watershed Analysis. Regardless, using Watershed Analysis for DNR's HCP was considered impractical because of the long time period necessary to complete analyses of the many WAUs that contain DNR-managed lands in the west-side planning units. For this reason, the use of Watershed Analysis was eliminated from the list of reasonable alternatives, although DNR does commit to participate in Watershed Analysis and adopt the resultant guidelines if they are more constraining that the HCP strategies. This commitment includes participation in priority watersheds identified by NMFS.

D. HCP COMMITMENTS

Summary: NWIFC, Port of Port Angeles, the National Audubon Society, Sierra Club, WEC, Rivers Council of Washington, three local environmental organizations, Bogle & Gates (a consultant to Washington State University), and 59 individuals commented on the commitments of the draft HCP and/or draft IA. Fifty-one individuals used an identical form letter to comment. The most common concern was that some conservation measures in the draft HCP are compromised by such language as "practicable", "economically reasonable", and "consistent with trust obligations." Commentors used such phrases as "noncommittal", "ambiguity", "vague", "loopholes", "double-speak", and "weasel words" to express their concerns.

Response: Where a particular mitigation measure or management prescription is noncommittal, the Services have not relied on that measure in assessing the merits of the HCP. As reflected in the Purpose and Need statement of the draft EIS, DNR has a duty to produce the most substantial support possible over the long term for the trusts. DNR intends to follow the guidelines presented in the HCP, but realizes that inevitably management situations will arise where the guidelines are, for operational reasons, completely impracticable. This could place an unreasonable burden on DNR's management and be

contrary to its trust obligations. Therefore, for some mitigation measures or management prescriptions, DNR must insist on noncommital language to account for such situations. In order to strengthen the commitments of the HCP, the words "economically reasonable" have been replaced with the word "practicable" wherever they appear in the draft HCP.

E. PRESIDENT'S NORTHWEST FOREST PLAN

Summary: American Rivers, Northwest Ecosystem Alliance, and 11 individuals recommended DNR use the standards and guidelines for Riparian Reserves contained in the President's Northwest Forest Plan for its HCP. In particular, these organizations and individuals recommended 300-foot no harvest buffers on all fish-bearing streams. Several individuals characterized the standards and guidelines of the President's Northwest Forest Plan as the minimum essential to protect the original forest ecosystem or the minimum protection as determined by the ESA. One individual said that the standards and guidelines in effect on federal lands are detrimental to the total value of forested land.

Response: The Services believe federal land management plans serve a different role than nonfederal land conservation plans. It is federal policy to be more conservative on federal lands. However, nonfederal lands are very important for some species and conservation must occur on these nonfederal lands as well, if some of these species are to be recovered. It is federal policy to be less conservative, and therefore assume more risk, on nonfederal lands. Thus the Section 10 HCP process allows the incidental take of threatened and endangered species, but the level of incidental take must not preclude recovery of the species addressed in the plan.

F. PROPOSED FEDERAL RULES

Summary: The Muckleshoot Indian Tribe commented the FEIS should include an additional alternative which assesses the impacts that could occur if the USFWS issued a 4(d) rule relieving private landowners from northern spotted owl take restrictions.

Response: The Section 7 consultation report on the issuance of DNR's HCP will include an evaluation of the environmental baseline. If the 4(d) rule for nonfederal landowners is final before DNR's HCP, the effects of the 4(d) rule on the northern spotted owl will be part of the environmental baseline. Also, see responses to comments on the spotted owl on pages 3-62 through 3-105 in this section.

G. DNR's FOREST RESOURCE PLAN

Summary: WDFW, NWIFC, a county commissioner, the Northwest Forestry Association, The Mountaineers, Bogle & Gates (a consultant to Washington State University), and one individual had comments related to DNR's Forest Resource Plan. WDFW asked how the HCP will affect the Forest Resource Plan goal to avoid harvesting stands that are less than 80 years old. Based on the tribal policy presented in the Forest Resource Plan, NWIFC encouraged DNR to consult with tribes when making land-management decisions and to protect treaty resources when it makes those decisions. A county commissioner claimed that DNR policies in excess of current state and federal laws, in conjunction with a Memorandum of Understanding with the Hoh Tribe, have resulted in there being no timber sales in the Hoh-Clearwater Block. The Northwest Forestry Association believes that the draft HCP does not comply with the Forest Resource Plan because the plan provides direction for how to produce

income while protecting fish, water, and wildlife, but the draft HCP only provides direction for how to protect fish, water, and wildlife and makes little pretense of connecting income production with environmental protection. They also suggested that the Forest Resource Plan be further developed for consideration as an HCP alternative. Bogle & Gates, a consultant to Washington State University, suggested that current policies in the Forest Resource Plan, in particular those addressing riparian management zones, wetlands, wildlife habitat, endangered species, landscape planning, and applied research and monitoring form the basis for an adequate HCP, and it is difficult for them to identify any clear advantage of Alternative A over Alternative B. One individual stated that the Forest Practices Rules and DNR policies provide adequate protection for fish and wildlife and requested that DNR not increase the level of protection until these rules and policies prove to be inadequate.

Response: The Forest Resource Plan (p. 18-19) says that in western Washington the average rotation age will be 60 years and may range from 45 years to 100 years.

DNR and the Board of Natural Resources intend for their actions to be consistent with the policies, including the tribal policy, presented in the Forest Resource Plan. In fact, the HCP is an alternative means of implementing certain policies within the plan.

DNR's draft HCP is completely consistent with DNR's Forest Resource Plan. The Forest Resource Plan is a policy document. It was approved in 1992, but has yet to be fully implemented. Implementation of the Forest Resource Plan policies requires the development of specific management guidelines. Important to understanding DNR's need for increased regulatory certainty, the Forest Resource Plan is thoroughly inadequate for issuance of an ITP or unlisted species agreement. It does not contain the degree of management guidance required by the Services for an HCP.

H. FEMAT AND RECORD OF DECISION

Summary: Five individuals and two conservation organizations expressed their belief that the 1994 President's Northwest Forest Plan Record of Decision contains the minimum standards that should be used in DNR's HCP. Another three individuals specifically stated that the "no cut" buffers in the President's Northwest Forest Plan should be used in DNR's HCP. One individual pointed out that the HCP should incorporate the Forest Plan ROD for specialized forest products (poles, rails, landscape transplants, mushrooms, fruits, berries, and medicinal forest products). The Northwest Ecosystem Alliance stated that the buffers developed by the Scientific Analysis Team or some other scientifically defensible buffers that provide riparian protection should be incorporated into the HCP. One individual commented federal regulations are proving detrimental to the total value of forested lands.

Response: The Services note the Forest Ecoysystem Management Assessment Team (FEMAT) report and, subsequently, the issuance of the Record of Decision for the President's Northwest Forest Plan do not mandate prescriptive treatment on nonfederal lands. The President's Northwest Forest Plan Standards and guidelines were developed to address forest management on the covered federal lands. The Services do note that the timing of the release of the Scientific Analysis Team report, and its use in FEMAT, usually links it to FEMAT. The Service again notes that the HCP and associated application for an ITP are voluntary actions conducted by DNR to seek relief from restrictive regulations. The promulgation of

federal regulations and their impact on nonfederal lands within the State of Washington are beyond the scope of this project.

I. REMARKS REGARDING DNR HISTORY

Summary: Several individuals criticized past DNR management for harvesting too much old-growth forest, degrading wetlands, failing to act with a long-term vision, or not properly balancing resource protection and income for the trusts. Three individuals said that DNR has harvested 96 percent of its forests. One individual said that had the HCP been done earlier, the past disruption to timber harvest might have been avoided. One individual claimed that the financial return to the trusts has decreased substantially since Jennifer Belcher became Commissioner of Public Lands.

Response: DNR has a duty to produce the most substantial support possible over the long term to the trusts within the context of all state and federal regulations. DNR's forest management has, to the best of its ability, always complied with all state and federal regulations. Unfortunately, regulations intended to protect public resources are often reactive to destruction that has already occurred. The reactive nature of regulations is due, in part, to a lack of accurate predictive models that explain the impacts of management on fish, wildlife, and ecosytems. Only ten years ago, scientific understanding of how regional and landscape-scale forest management affects fish and wildlife populations was only rudimentary. As we come to a fuller understanding of these complex ecological processes, we will come to strike the proper balance between the production of commodities and the protection of ecosystems. Finding ways to strike this balance is the main mission of the OESF.

To satisfy its trust obligations, DNR must manage trust lands to generate revenue while complying with all state and federal regulations. DNR has harvested a large proportion of DNR-managed lands, but not 96 percent of the forest. These commentors erroneously arrived at this number because they misinterpreted information given on p. I.2 of the draft HCP. The draft HCP states, "of the 1,580,000 acres of DNR-managed lands covered by the HCP, approximately 1,520,000 acres are in timber production." Lands in timber production, or on-base lands, have not necessarily been harvested. Figure I.1 on p. I.3 of the draft HCP shows the age distibution of forest stands on DNR-managed lands. Approximately 10 percent are older than 100 years.

A large decrease in revenue occurred shortly after the federal listing of the spotted owl as a threatened species in 1990. Other short falls in timber harvest can be attributed to the federal listing of the marbled murrelet. Income from DNR-managed lands has increased since 1992. In fact, income from DNR-managed forest lands in 1995 was one of the largest amounts ever.

XVI. THE HCP PROCESS

A. HABITAT CONSERVATION PLANS

Summary: The HCP concept is supported by State Representative Mark Schoesler, the Elwha/Clallam Tribe, the Tulalip Tribes, the Muckleshoot Indian Tribe, Skamania County, Washington State Association of Counties, National Audubon Society and six chapters, WEC, Washington Native Plant Society, League of Women Voters, Northwest Biodiversity Center, The Mountaineers, GBA Forestry, Inland Wood Specialties, Washington Hardwoods

Commission, Western Hardwoods Association, Merrill & Ring, the Washington Forest Protection Association, Port of Port Angeles, an individual member of the Blue Ribbon Coalition, and 14 other individuals. On the other hand, American Rivers, the Environmental Resource Center, a professor at the University of Montana, and eight individuals commented the HCP is granting an exemption from ESA requirements for the next 100 years. Three individuals stated their belief that incidental take should not be allowed.

Response: The Services acknowledge the support expressed for the HCP process. The Services' disagree that approval of an HCP constitutes an exemption from the ESA. As expressed repeatedly herein, the ESA provides for the preparation of HCPs in Section 10. The Services ability to grant permission for incidental take was authorized under the 1982 amendments to the ESA. It is beyond the scope of the presently proposed action to determine whether the authorization of incidental take should be a part of the ESA.

B. PROPERTY RIGHTS

Summary: Stevens County Commissioner Anderson wrote that the HCP represents a "taking." Commissioner Anderson also commented that the ESA is a federal statute with application only in the District of Columbia and other Territories under federal jurisdiction, to the exclusion of all other lands.

Response: No factual or legal basis supports the notion that the HCP constitutes a "taking" of private property for a public purpose under the Fifth Amendment to the Constitution of the United States. The assertion that the ESA has no application outside of the District of Columbia or other jurisdictional protectorates of the federal government has no foundation in law or fact.

C. THE HCP AND OTHER ASPECTS OF THE ESA

Summary: Stevens County Commissioner Anderson and another individual commentor asserted that the ESA is currently under review and will be modified, suggesting that this may influence the validity of the HCP. Another individual commented the HCP and DEIS are not in compliance with ESA, Section 3, among others. One individual wrote DNR is not complying with the ESA and the HCP should at minimum comply with the standards in the "1994 Forest Compromise Plan and Record of Decision." Another individual wrote there must be a better policy for protecting owls than owl circles. The Washington Native Plant Society suggested that DNR should retain protective measures for plant species that were candidates for listing in the September, 1993 Federal Register notice. One commentor warned against doing anything that would weaken the protections of the ESA.

Response: The Services recognize that Congress must periodically reauthorize the ESA. However, the Services disagree that any amount of controversy surrounding this legislative process might "invalidate" any proposed or completed HCP. The proposed HCP is a long-term agreement that provides assurances for its duration against the possiblity that changing regulations could adveresly impact DNR's land management. The Services note that over the duration of the requested permit, regulations are as likely to become <u>more restrictive</u> as less restrictive. It is this regulatory uncertainty that several other HCP proponents have proferred as underlying their need to prepare an HCP under ESA Section 10 (e.g., Murray-Pacific HCP Amendment, Weyerhaueser Millicoma, ODF Elliott State Forest, Plum Creek Timber

Company). Therefore, a nonfederal landowner gains a greater amount of certainty for its planning and management under an HCP than by waiting for the machinations of Congress.

ESA Section 3 is a definition section. The Services disagree that this HCP proposal is out of compliance with any of the definitions contained in ESA Section 3. As for the comment regarding the "Forest Compromise Plan," the Services believe the commentor was referring to the 1994 Record of Decision for the President's Northwest Forest Plan and respond that the President's Northwest Forest Plan was meant to apply to the management of federal forest land in the range of the northern spotted owl. In fact, that set of planning documents recognized that nonfederal forest land in the range of the northern spotted owl would make different contributions to habitat conservation, and the completion and approval of HCPs was part of that vision.

The Services believe that in the absence of any better proposal, the use of owl circles is the best way to track owl home ranges to avoid unauthorized take. The Services do agree that there are different possible approaches as exemplified in the President's Northwest Forest Plan (which makes use of circles) and other previously approved HCPs which address the northern spotted owl.

The Services note that because this plan is proposed as an all-species habitat-based approach, all species of plants, listed and unlisted, are addressed by the HCP where they occur in habitats that are present on DNR-managed land that is protected under the proposed plan. The Services note that nonfederal land is usually not required to have a role in contributing to the conservation of listed plants unless such is required by state law and no such Washington State law exists. Furthermore, the proposal exceeds the No Action alternative in addressing plants.

Finally, the HCP process is enabled under the ESA itself and therefore cannot undermine the ESA.

((THIS PAGE INTENTIONALLY LEFT BLANK))