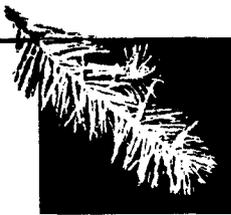


Section 3 - Response to Comments





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## **Section 3. Response to Comments**

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### **3.1 Outline of Comment Categories**

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**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)

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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*

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*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**

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- 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)**

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## **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**

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**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**



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## **3.2 Comment Summaries and Responses**

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### **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

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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 demonstrates that timber harvest will not increase the frequency or

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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.

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**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.

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## **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

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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 demonstrates 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

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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

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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

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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 referred 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",

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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.

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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 led 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  $\leq 30$  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 interstices within the talus is important for movement within the talus of the

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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

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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 maintain 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

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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

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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.

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## 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 address 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

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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.

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**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

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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

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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 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-

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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

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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

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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

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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

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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

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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

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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

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(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

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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”. WEC suggested that DNR adopt the approach employed in the Riparian Function Module of the Washington Forest Practices Watershed

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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).

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#### **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  $\geq 20''$  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

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hollow snags  $\geq 40$  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 dispersal habitat areas that serve to provide some connectivity between non-contiguous federal lands are most notable in the area north of Hwy.

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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.

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**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.

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**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

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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. Furthermore, DNR’s HCP should make an important contribution toward maintaining the geographic distribution of species with small home ranges and support the conservation 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

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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 explanation.

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

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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 hibernacula. 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

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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

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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 explanation 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

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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

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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

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an explanation 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.

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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.

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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

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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

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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

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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

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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.

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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 commentator 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.

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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

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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 commentor's 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.