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1. Introduction

The state of Washington has developed the Forest Practices Habitat Conservation Plan (FPHCP) in response to the federally threatened and endangered status of certain fish species. Developing the FPHCP is one of the implementation measures resulting from the 1999 Forests and Fish Report, the forestry module of a larger comprehensive statewide effort to protect aquatic species, their habitats and water quality.

The FPHCP is characterized as a "programmatic" habitat conservation plan. Unlike most habitat conservation plans, which cover a defined land base and ownership, the FPHCP is linked to Washington's Forest Practices program, which regulates forest practices activities on primarily non-Federal and non-tribal forestlands in the state. Forest practices activities on these lands must comply with the state's Forest Practices Act (chapter 76.09 RCW) and rules (title 222 WAC). The purpose of the FPHCP is to assure those conducting forest practice activities, covered by or subject to the Forest Practices program, that they will also be in compliance with the Endangered Species Act (ESA) for covered threatened and endangered species. Therefore the term "assurances" is used throughout this document.

The Forests and Fish Report (FFR) was a multi-stakeholder effort that utilized the best available science to guide the direction of aquatic species protection. Completion of the FFR includes obtaining an incidental take permit from each of the Federal agencies responsible for implementation of the ESA. The state is seeking these assurances through the development of the FPHCP as a major step towards achieving the goals of the FFR. The FFR has four goals:

1) To provide compliance with the Endangered Species Act for aquatic and riparian-dependent species on non-Federal forestlands;

2) To restore and maintain riparian habitat on non-Federal forestlands to support a harvestable supply of fish;

3) To meet the requirements of the Clean Water Act for water quality on non-Federal forestlands; and

4) To keep the timber industry economically viable in the state of Washington.

These goals remain the goals of the FPHCP as they relate to the regulation of forest practices on non-Federal and non-tribal forestlands.

The Federal Endangered Species Act (Section 10 (a)(1)(B)) allows applicants—in this case Washington State—to submit a habitat conservation plan to the Services detailing how species included in the plan will be protected. Once the habitat conservation plan is reviewed and approved, a permit may be issued that allows for the incidental take of a listed species while conducting otherwise lawful covered activities. In addition, unlisted

species may be included in the plan and if, at some time in the future, they become listed, incidental take will be provided for these species. Throughout the remainder of this document, the term "covered species" refers to all listed and unlisted species included in the FPHCP.

The FPHCP includes the following elements:

- The Executive Summary that gives a general overview of the elements of the FPHCP.
- A Statement of Purpose that outlines the intent of the FPHCP; a description of the relationship of the Clean Water Act (CWA) and ESA to federal assurances, including the requirements for an Incidental Take Permit under the ESA; and a discussion of the forest practices activities, lands and species covered by the FPHCP. Also included is a discussion of species not covered by the FPHCP (Chapter 1).
- The context of the plan, including important milestones in the history of forest practices regulation in Washington State and how they relate to the FPHCP, a discussion of the mosaic of other salmon recovery plans and efforts in Washington and a description of the Federal and state laws that impact natural resource protection in Washington (Chapter 2).
- A description of the life history and habitat requirements of the fish and riparian-dependent amphibian species covered by the FPHCP, their distribution and status within Washington and the environmental factors that affect the species (Chapter 3).
- A description of the two primary components of the FPHCP—
    1. The administrative framework that supports forest practices program development, implementation and refinement, and that defines the roles of the diverse group of participants who work together to accomplish the goals of the program.
    2. The laws, rules and guidance that represent the protection measures for aquatic resources (Chapter 4).
- A review of the other alternatives considered for achieving the aquatic resource protection goals of the FFR, how they were developed and the reasons for not selecting these alternatives (Chapter 5). A complete discussion of all the alternatives, including the Services proposed action, can be found in the Environmental Impact Statement (EIS) that accompanies the FPHCP.

1-1 Statement of purpose

As indicated earlier, one goal of the FFR was to provide compliance with the ESA for aquatic and riparian-dependent species on non-Federal and non-tribal forestlands. To achieve this goal, the state of Washington has prepared the FPHCP as a means of

complying with the requirements of the ESA. The state has applied to the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) and the United States Fish and Wildlife Service (USFWS)—collectively referred to as the Services—for permits that authorize the incidental take of covered species listed as threatened or endangered under the ESA. If approved, take authorization comes in the form of a permit issued individually by each of the Services, commonly referred to as an "Incidental Take Permit." The permit would also provide for the incidental take of covered, unlisted species in the event that they become listed during the duration of the permit.

Given the broad geographic range of forestlands subject to the state's Forest Practices Act and rules, the large number of landowners involved, the multiple species included and regulatory nature of the planning effort, the state has developed the FPHCP as a programmatic plan. In a programmatic plan, protection for covered species is most often provided through regulatory and administrative requirements. Whereas most habitat conservation plans approved to date represent direct agreements between the Services and an individual landowner, the programmatic nature of the FPHCP links forest landowners to the Services through the state of Washington's Forest Practices program.

Washington's 2001 forest practices rules revisions were developed to improve riparian habitat function and increase protection for aquatic species while maintaining a viable forest products industry on approximately 9.3 million acres of forestland. These rules are a product of the FFR, a science-based plan for protecting water quality and aquatic habitat on non-Federal and non-tribal forestland in the state. Stakeholder groups, including Federal agencies, state agencies, treaty tribes, counties, family forest landowners and large forest landowners produced the report jointly. The state legislature adopted the report in 1999 and directed the Forest Practices Board to develop rules consistent with the report (RCW 77.85.180). The legislature took this action with the understanding that the governor, or his/her designee, would obtain assurances from the Federal agencies to the effect that compliance with the forest practices rules as amended and implementation of the recommendations in the Forests and Fish Report will satisfy Federal requirements under the Endangered Species Act and the Clean Water Act (RCW 77.85.190 (1), (3)). The legislature also stipulated a June 30, 2005, deadline for obtaining assurances under the Endangered Species Act (RCW 77.85.190(4)).

In a letter dated January 8, 2003, the governor requested that the Commissioner of Public Lands act as his designee to obtain assurances from the Federal agencies. The Commissioner of Public Lands, as the governor's designee, is working with the USFWS, NOAA Fisheries, and the Environmental Protection Agency (EPA) to complete the implementation of the FFR by seeking assurances under the Endangered Species Act and the Clean Water Act. Both assurances under the ESA and CWA are intended to recognize that the Forest Practices program and rules effectively meet Federal ESA and CWA requirements.

One of the state's primary goals in obtaining assurances from the Federal agencies is relief from any claim that forest practices subject to the state forest practices rules could be the basis of an alleged "take" of any covered threatened or endangered aquatic species.

Another objective is to provide a regulatory climate and structure more likely to keep landowners from converting forestlands to other uses that would be less desirable for salmon recovery. The landmark FFR and the subsequent revised forest practices rules are a substantial step forward in contributing to public resource protection in Washington. Achieving assurances from the Federal agencies will demonstrate how state and Federal laws can work together to achieve public resource protection while maintaining economic viability for forest landowners.

1-2 Endangered Species Act and assurances

Passed in 1973, the Endangered Species Act provides for the designation and protection of invertebrates, wildlife, fish and plant species that are in danger of becoming extinct and provides a means to conserve the ecosystems on which such species depend.

The ESA defines an endangered species as any species that is in danger of becoming extinct throughout all or a significant portion of its range (16 U.S.C. § 1532(6)). A threatened species is one that is likely to become endangered in the foreseeable future (16 U.S.C. § 1532(20)). Section 9 of the ESA makes it unlawful to "take" a species that is listed as endangered without a permit from the secretary of the Department of the Interior (DOI) or the Department of Commerce (DOC). The term "take" under the ESA is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 U.S.C. § 1532 (19)) any species listed as endangered under the ESA. The take prohibitions can be extended to species listed as threatened by Federal regulation (16 U.S.C. § 1538(a)). USFWS, under DOI, and NOAA Fisheries, in DOC, share responsibility in administering the ESA. Generally, USFWS is responsible for terrestrial and freshwater aquatic species while NOAA Fisheries is responsible for marine mammals, anadromous fish and other marine species.

The state of Washington is seeking assurances under the ESA through the development of the FPHCP and the subsequent issuance of Incidental Take Permits, under Section 10 of the ESA, from each of the Services.

Alternatively, the state of Washington can seek assurances through a limit from ESA take prohibitions as outlined in the 4(d) rule adopted by NOAA Fisheries (65 FR 42422, July 10, 2000, 50 CFR § 223.203). This rule prohibits take of threatened salmon and steelhead in 14 Evolutionarily Significant Units (ESU), including areas in Washington. Along with establishing take prohibitions, the rule provides that certain specified activities or conservation plans may qualify for a limit from the rule's take prohibition provided that such activities or programs qualify for one of 13 categories known as "limits." Limit 13 of this rule applies to forest management activities in Washington. Before a take limit could become effective, NOAA Fisheries must find that the state forest practices regulations include the regulatory elements of the Forests and Fish Report (NMFS 2003). NOAA Fisheries must also find that the regulations are consistent with the conservation of listed salmonids' habitat by contributing to the attainment and maintenance of properly functioning conditions. The forestry take limit does not cover forest chemical applications, requires implementation of the non-regulatory elements of FFR and contains a process for approval of alternate plans.

The Northwest Regional Administrator can provide NOAA Fisheries' findings in a response letter to the submittal, and may either approve or disapprove the submittal. Before NOAA Fisheries issues an approving letter or makes the included findings, notification must be given in the *Federal Register* for public review with a 30-day (minimum) comment period. The 4(d) process currently only applies to threatened salmonids under NOAA Fisheries jurisdiction. A 4(d) rule Limit 13 approval would remain in place unless NOAA Fisheries at some time in the future finds the forest practices regulations inadequate. Threatened bull trout would not be covered by the 4(d) process unless USFWS promulgates a 4(d) rule for bull trout.

1-2.1 Forest Practices Habitat Conservation Plan

The state of Washington has initiated a process seeking coverage for incidental take, under Section 10 of the ESA. This process requires preparation of a conservation plan that must satisfy requirements under this section of the ESA. A habitat conservation plan under Section 10 must include the following (16 U.S.C. 1539(a)(2)(A)):

- The impact which will likely result from the take;
- What steps the applicant will take to monitor, minimize and mitigate such impacts; the funding available to implement such steps; and as well as the procedures to be used to deal with changed and unforeseen circumstances;
- What alternative actions to such taking the applicant considered and the reasons why such alternatives are not being utilized; and
- Other measures that the secretary of the Interior and/or Commerce may require as being necessary or appropriate for purposes of the plan.

1-2.2 Issuance Criteria

HABITAT CONSERVATION PLAN

When the Services determine that all criteria for a habitat conservation plan have been met, and after an opportunity for public comment, an Incidental Take Permit (ITP) must be issued if the applicant meets the following criteria (16 U.S.C. 1539(a)(2)(B)):

1) The taking will be incidental;
2) The applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking;
3) The applicant will ensure that adequate funding for the plan will be provided;
4) The taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and
5) Such measures that the secretaries of the Interior and Commerce may require as being necessary or appropriate for the purposes of the plan will be met.

An ITP allows a permit holder to conduct otherwise lawful covered activities in the presence of listed species without being liable for the criminal or civil penalties that may

result from an unauthorized taking described in Section 9 of the ESA provided activities comply with the permit.

SECTION 7 CONSULTATION

Section 7(a)(2) of the ESA requires all Federal agencies "in consultation with and with the assistance of the Secretary" to ensure that "any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification" of designated critical habitat. The Section 7 implementing regulations (50 CFR Part 402) require, among other things, analysis of the direct and indirect effects of a proposed action, the cumulative effects of other activities on listed species and effects of the action on critical habitat, if applicable. For the FPHCP, effects on covered, unlisted species must be analyzed and a statement of incidental take must be provided for all covered (listed and unlisted) species. Consultation under Section 7 of the ESA is the Federal agency's responsibility, not the applicant's. However, the EIS and the state's HCP are designed to assist the Services consultation process by addressing these issues.

1-2.3 Term of the Plan

The state of Washington is seeking incidental take permits, from both Services, for a term of 50 years. The FPHCP is based on Washington's Forest Practices program and consists of two parts: an administrative framework and protection measures, as described in Chapter 5. It relies, in part, on an effective Adaptive Management program (See Section 4a-4). The purpose of the Adaptive Management program is to produce technical information and science-based recommendations to assist the Forest Practices Board (the Board) in determining if and when it is necessary or advisable to adjust forest practices rules and guidance in order to achieve program goals, resource objectives and performance targets (see below). As a result, a successful Adaptive Management program is essential to ensuring the ongoing development and implementation of measures that effectively conserve the habitats of species covered under the FPHCP.

FPHCP PERFORMANCE GOALS, RESOURCE OBJECTIVES AND PERFORMANCE TARGETS

- In addition to the FFR goals listed above, the FFR established **performance goals** that were later adopted in rule (WAC 222-12-045 (2)(a)) as the focus of the Adaptive Management program (described in Section 4a-4). This rule states that forest practices, either singularly or cumulatively, are intended to be conducted in a manner that will not significantly impair the capacity of aquatic habitat to:

  1. Support harvestable levels of salmonids,

  2. Support the long-term viability of other covered species, and

  3. Meet or exceed water quality standards (including protection of designated uses, narrative and numeric criteria, and antidegradation).

- **Resource objectives**, while qualitative, are more specific and are tied to environmental variables potentially affected by forest practices, including water temperature, large woody debris, sediment and hydrology. Resource objectives are contained in Schedule L-1 (Appendix N).

- **Performance targets** are specific, quantitative measures that define attainable target forest conditions and processes. They are tied to the same environmental variables listed above and are also found in Schedule L-1 (Appendix N).

FUNDING

Few other regulatory programs in the state of Washington have received the financial backing the Forest Practices program has received since new rules were adopted in 1999. This is due to the revised rules and program, based on the Forests and Fish Report, being adopted as the state's Forestry Module in its overall salmon recovery strategy, and the broad support the program has received from stakeholders to the process.

Since 1999, almost $59 million in Federal and state funding has been appropriated for adaptive management, rule enforcement, mapping for unstable slopes, protection of archaeological and cultural resources in riparian areas, providing technical assistance to forest landowners to implement new rules, new information management systems, verification of compliance with rule requirements, and other activities (See Figure 1.1, next page).

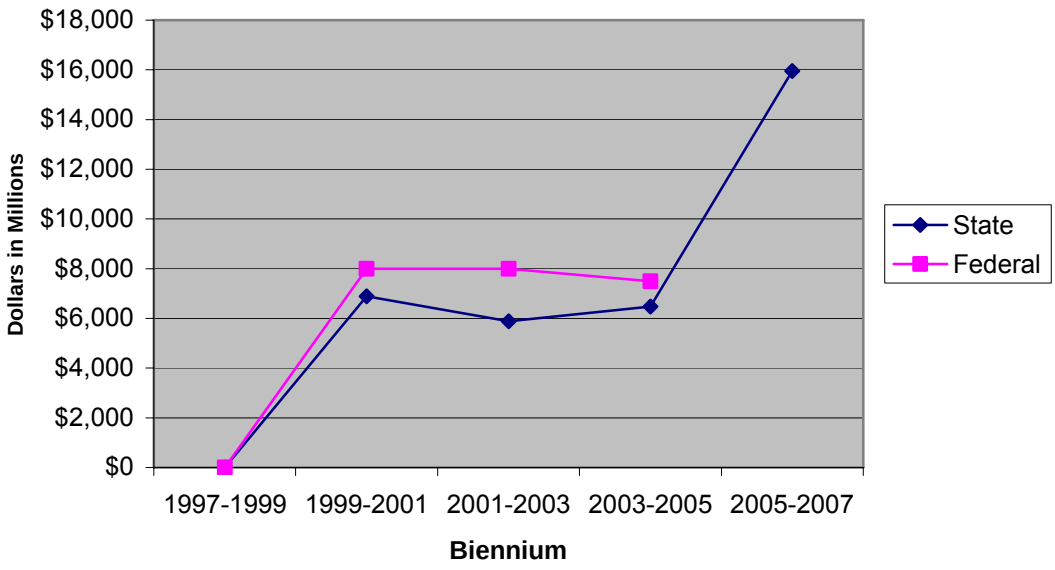
The money appropriated does not include in-kind contributions associated with stakeholder participation in Adaptive Management program, forgone landowner revenue associated with more stringent regulations and direct landowner expenditures on complying with the regulations, such as upgrading and abandoning forest roads. According to the Washington Forest Protection Association (WFPA), that cost is estimated to be approximately $200 million (as of November 2005) forgone and spent by landowners each year (WFPA, pers. comm., October 2005).

Given the level of support by stakeholders and the importance of the program to the state's overall salmon recovery strategy, continued legislative funding support is strongly anticipated. The state and Forests and Fish stakeholders have and will continue to work with the legislature and other funding sources to ensure adequate funding is available to implement the program and fulfill the commitments in the FPHCP, the Implementation Agreement and the Permits.

DNR shall submit to the Washington State Legislature, on at least a biennial basis, an agency operating and capital budget necessary to implement the program and enforce the rules described in the FPHCP, as well as fulfill other obligations under the Incidental Take Permits (ITP) and Implementation Agreement (IA). Failure to secure adequate funding shall be grounds for suspension or partial suspension of the ITP.

Figure 1.1 Appropriations for Forests & Fish 1999-2005

as of November 2005



REPORTING

Reports describing FPHCP implementation status will be prepared and submitted to the Services annually. In addition, five-year review reports, which summarize all annual reports prepared to date, will be submitted to the Services. The first annual report will be submitted one year following receipt of the ITP and every year thereafter throughout the life of the ITP. Likewise, five-year review reports will be submitted every five years throughout the life of the ITP.

The primary focus for these reports will be the monitoring and research activities carried out by the Adaptive Management program (Section 4a-4.1); however, DNR will also report on compliance monitoring activities (Section 4a-3.1.3). Any substantive changes to the forest practices administrative or regulatory program will be included in these reports. Table 1.1 displays the program elements, examples of the projects/tasks included in each element as well as the report format and frequency. In general, each report will contain narrative status summaries for each program element, as well as summary data from completed projects. Information or data more specific than that contained within the reports can be supplied upon request. Field visits to project sites can also be arranged upon request.

These and other commitments related to FPHCP implementation are included in the Implementation Agreement (Appendix A).

Table 1.1 FPHCP Reporting Elements

Program Element	Types of Projects/Tasks	Reporting Information	Reporting Frequency
Compliance Monitoring	Type F RMZ compliance, road construction & maintenance compliance, fish passage compliance, Type N RMZ compliance	Summary reports and/or raw data	Annual or upon request by the Services
Effectiveness & Validation Monitoring	Type F and Type N prescription effectiveness, CMZ validation and effectiveness, road effectiveness, mass wasting effectiveness, fish passage effectiveness	Summary reports and/or raw data	Annual or upon request by the Services
Extensive Monitoring	Type F and Type N RMZ status and trends, fish passage status and trends	Summary reports and/or raw data	Annual or upon request by the Services
Intensive Monitoring	Type F aquatic habitat biotic and Type N downstream water quality/fish response, mass wasting validation, roads validation and sediment cumulative effects	Summary reports and/or raw data	Annual or upon request by the Services
Rule Implementation Tools	Stream typing model, sensitive site ID, Type Np initiation point, DFC validation, Eastside temperature nomograph, unstable landform ID	Summary reports and/or raw data	Annual or upon request by the Services
Administrative & Regulatory Program Updates	Statute, rule, funding updates; 20 acre exempt activities; landowner/tribal meetings and process improvements pursuant to WAC 222-20-120; RMAPs status; annual legislative reports; other administrative actions, etc.	Summary reports	Annual or upon request by the Services

1-2.4 Unforeseen Circumstances and No Surprises

UNFORESEEN CIRCUMSTANCES

The legislative history of the ESA addresses the desirability and need to address "unforeseen circumstances" during the term of an Incidental Take Permit; that is, unforeseen circumstances which might result in a substantial and adverse change in the status of a covered species, increase the level of incidental take or jeopardize a listed species while the permit is valid. Planning for and becoming contractually bound to a method for dealing with some unforeseen future event is not easy. However, the uncertainty and unknown cost of dealing with an unforeseen occurrence or an event of unknowable dimensions happening at some unknown time cannot be allowed to curtail all human activity affecting the environment and/or forestall helpful efforts to protect threatened or endangered species.

NO SURPRISES

Provided that the state has complied with its obligations under the HCP, the IA, and the Permits, the Services may require the state to provide mitigation beyond that provided for in the HCP only in accordance with the "no surprises" regulations at 50 C.F.R. §§ 17.22(b)(5), 17.32(b)(5), 222.307(g).

The FPHCP relies on the state's Forest Practice program as the primary measures to minimize and mitigate any take being authorized, and such state programs are authorized by state law and subject to change only in the manner provided by the state's constitution and other applicable state law. Therefore, the state's officials cannot commit through the HCP, the Permits, the IA or otherwise to alter such state programs in any manner not authorized by the state's constitution and applicable state law. If the Services determine that current or future Federal "No Surprises" provisions would require suspension or termination of the HCP and Permits unless changes are made in state laws, rules, or administrative policies, the Services will notify the state and allow a reasonable time for the state to consider making such changes. If the state determines not to make changes the Services consider necessary for the HCP and Permits to remain in effect, the state shall so notify the Services.

1-2.5 Changed Circumstances

The FPHCP covers the state of Washington's Forest Practices regulatory program as it relates to aquatic resources under likely circumstances. The state of Washington and the Services foresee that circumstances could change during the term of the FPHCP, by reason of such natural events as wildfire, winds, floods, disease/pest outbreaks or listing of a new species. The Washington State Legislature gives authority to the Board to adopt forest practices rules, but the legislature restricted the Board's authority to adopt any new

rules covering aquatic resources.[1] Therefore, responses to changed circumstances will be addressed as appropriate through the existing Forest Practices program and administrative processes, including the Adaptive Management program. The state of Washington and the Services, along with potentially affected landowner(s), will consult with each other as soon as possible once a changed circumstance has been identified. The objective of such consultation will be to identify a mutually agreeable course of action to address the changed circumstances. If agreement cannot be reached, the Adaptive Management program includes a dispute resolution process (IA at 12.3.1, WAC 222-12-045(2)(h)). Specifically, the Adaptive Management program will be called upon to determine, through review of the prevailing science, appropriate courses of action to respond to them. Chapter 4 of the FPHCP, specifically Sections 4a-1 and 4a-4, describe the Adaptive Management program participants and how the program functions. The ITPs will authorize the incidental take of covered species under ordinary circumstances, as well as changed circumstances, so long as the state of Washington is operating in compliance with the FPHCP, the IA, and the ITPs.

Flooding and Landslides

Two types of changed circumstances already addressed by the rules in the FPHCP are flooding, and potentially unstable slopes or landforms. The effects of flooding on forest practices during the 50-year HCP/ITP duration are minimized and mitigated by rules that prohibit harvest with channel migration zones (CMZs) or bankfull widths of streams, and the requirement to provide riparian buffers outside the CMZs (WAC 222-30). The effects of forest practices on potentially unstable slopes or landforms are minimized by rules (WAC 222-10-030; WAC 222-16-050) that require evaluation by a qualified expert and may require mitigation if determined that the forest practice would have a probable significant adverse impact on an unstable slope or landform. WAC 222-10-30 requires, in part, specific mitigation measures or conditions designed to avoid accelerating rates and magnitudes of mass wasting that could deliver sediment or debris to a public resource. The WAC defines public resources to include water, fish and wildlife.

Climate Change

The state acknowledges that the effects of global climate change may have an effect on riparian and aquatic resources, including covered species and their habitat, over the life of the FPHCP and the 50-year ITPs. Although the manifestations of global climate change on covered species on FPHCP covered lands are reasonable to anticipate, the magnitude or effects cannot be specifically predicted or planned for in advance of HCP implementation. However, the FPHCP's Adaptive Management program addresses aquatic resource functional elements that could be affected by climate change, i.e., stream temperature and hydrology, through the CMER Workplan (FPHCP Appendix H) which provides for researching, evaluating, and adapting to the effects of covered activities on the functional elements of aquatic and riparian habitat. Although a cause and effect relationship would be speculative and can't reasonably be planned for, the Adaptive

[1] RCW 76.09.370(6) After the board has adopted permanent rules under subsection (2) of this section, changes to those rules and any new rules covering aquatic resources may be adopted by the board but only if the changes or new rules are consistent with recommendations resulting from the scientifically based adaptive management process established by a rule of the board. Any new rules or changes under this subsection need not be based upon the recommendations of the adaptive management process if: (a) The board is required to adopt or modify rules by the final order of any court having jurisdiction thereof; or (b) future state legislation directs the board to adopt or modify the rules.

Management program is designed to address the effects of change in stream temperature and hydrology over time.

Disease and Pest Outbreak

The state acknowledges that disease and/or a pest outbreak may occur during the 50-year permit term, and that these events may have an affect on riparian and aquatic resources, including covered species and their habitat. Although it is reasonable to anticipate that disease or pest outbreaks may be manifested on the landscape and affect covered species on FPHCP covered lands during the permit term, the magnitude or effects of future events can not be specifically predicted or planned for in advance of implementation of the FPHCP. In addition to incorporating CMER-initiated research investigating the effectiveness of the forest practices rules, the FPHCP's Adaptive Management program is designed to also incorporate relevant data from "outside" sources. Information related to disease and pest outbreaks, including their effects on covered species, will be addressed through the Adaptive Management program if and when they occur. Although it is uncertain when, where and how disease and pest outbreaks may occur, the Adaptive Management program is designed to address the effects of changing environmental conditions. Exotic diseases and pest (not native to Washington) outbreaks are not considered changed circumstances.

Wildfires and Wind Storms

The types of changed circumstances that are likely to occur on the forested landscapes covered by the FPHCP that have not been directly addressed by the forest practices rules and can be reasonably be anticipated or planned for during the implementation of the FPHCP are wildfires and wind storms. While wildfires are more common and have a fire return interval less than 50 years (the duration of the FPHCP/ITP) east of the Cascade crest, they are substantially less likely to occur within a 50-year time interval west of the Cascade crest. Conversely, wind-throw events of a magnitude likely to affect the function of riparian habitat are more likely to occur west of the Cascades than east of the crest within a 50-year time interval. Therefore, changed circumstances include windthrow events west of the Cascade crest and wildfire events east of the Cascade crest. However, for both these types of naturally-occurring events the rates and magnitudes could vary across the landscape. Thus, the Board cannot reasonably plan specific responses in advance.

Addressing changed circumstances related to naturally occurring events of wildfires or wind storms may require establishing a threshold, such as acres of riparian habitat or stream miles affected, whereby the Board could request the Adaptive Management program to provide resource effect information to determine if actions need to be taken. Since this information is not readily available, the state agrees to collect and provide the best scientific data available to the Services within 180 days of permit issuance. These data are expected to inform the parties about the frequency, magnitude, distribution and potential effects of such events likely to occur within the 50-year permit period, and provide the basis for the parties to develop appropriate thresholds that will define when a changed circumstance in the case of wildfires or windstorms has occurred.

New Listings of Species Not Covered by the ITP:

If a species that is present or potentially present in the FPHCP area becomes listed under the ESA, the Services will determine if there is a potential for incidental take of the

species to occur while conducting forest management activities covered by the FPHCP. If so, the state can choose to adopt rules that ensure incidental take of the species will be avoided, and/or request the Services to add the newly listed species to the ITP in accordance with the provisions in the IA and FPHCP, and in compliance with the provisions of Section 10 of the ESA. If the state chooses to pursue incidental take coverage for the species by amending the FPHCP or by preparing a separate HCP, the parties (state of Washington, USFWS, and NOAA Fisheries) will enter into discussions to develop necessary and appropriate forest practices rules to meet ESA Section 10(a) requirements for incidental take coverage. All parties will endeavor to develop mutually acceptable mitigation measures and secure incidental take coverage prior to final listing of the species. In determining adequate mitigation for the species, the Services will fully consider conservation benefits to the species that have accrued from the time the original ITP was signed and the FPHCP was first implemented, although it is recognized that additional mitigation measures may be necessary to satisfy the requirements of the ESA.

1-3 Clean Water Act and assurances

Clean water is a critical component of healthy aquatic habitat and is vital to the protection of threatened and endangered aquatic species. The EPA and the Washington Department of Ecology (Ecology) anticipate that the forest practices rules will achieve steady progress in improving water quality in the short term and help to meet water quality standards in the longer term.

One of the purposes of the Forest Practices Act is to "achieve compliance with all applicable requirements of Federal and state law with respect to non-point sources of water pollution from forest practices" (RCW 76.09.010(2)(g)). The legislature intended that the forest practices rules consistent with the FFR would fully satisfy the requirements of the CWA with respect to non-point sources of pollution attributable to forest practices (RCW 77.85.180(2)). To ensure this is achieved and the relationship between the Forest Practices Act and the CWA is sound, the Board must reach agreement with Ecology's director (or the director's designee on the Board) before adopting forest practices rules pertaining to water quality protection (RCW 76.09.040(1)).

The strategy to gain assurances under the CWA includes EPA and Ecology recognizing the Forest Practices Act, the FFR, and the forest practices rules as the best management practices used to address non-point sources of pollution that result from forest practices. The Forest Practices Act, the FFR, and the forest practices rules will be included in the various procedures, policies, guidance, plans and reports that Ecology, as the State Water Pollution Control Agency, conducts and develops as part of its efforts to comply with the CWA. The strategy also recognizes the importance of an effective monitoring, adaptive management and enforcement program necessary to maintaining the assurances (FPHCP Section 2.3.6).

1-4 Activities covered by the plan

For the purposes of the FPHCP, "covered activities" include forest practices activities occurring on covered lands (Chapter 1, Section 1.5) within the state of Washington that are subject to the Forest Practices Act (RCW 76.09). The Forest Practices Act and rules define forest practices as "any activity conducted on or directly pertaining to forestland and related to growing, harvesting, or processing timber" (WAC 222-16-010). Activities include, for example, road and trail construction, road maintenance and abandonment, final and intermediate harvesting, pre-commercial thinning, reforestation, salvage of trees, and brush control. Because these activities have the potential to alter the habitats on which aquatic and riparian species depend, they have been designated as activities that are covered by the FPHCP.

The following is a summary of covered forest practices activities that occur on lands covered by the FPHCP:

TIMBER HARVESTING

Timber harvesting is the cutting and felling of trees, the limbing and bucking of trees into logs and the transporting of logs to a landing or loading area (otherwise known as log yarding). Logs may be yarded using ground-based equipment, cable systems, helicopters, balloons or other means. Operations include both intermediate and final harvests. Intermediate harvests are thinnings that may be performed once or more during the life of the forest stand. Final harvests are those that are followed by reforestation to regenerate a new forest stand.

ROAD CONSTRUCTION

Road construction is the act of creating a corridor to facilitate vehicular travel on forestland. Road construction typically involves excavating and depositing soil or rock to form a road prism; establishing ditches, culverts and waterbars to manage surface water; and installing culverts, bridges or fords across typed waters. Road construction includes the widening, realignment or modification of existing road prisms.

ROAD MAINTENANCE AND ABANDONMENT

Road maintenance is work performed to promote safe and efficient vehicular travel while minimizing negative resource impacts such as sediment delivery and hydrologic alterations. Road maintenance activities typically include surfacing, grading, erosion control, brush control, ditch clearing and drainage structure repair or replacement.

Road abandonment is work performed to prevent ongoing and future negative resource impacts by eliminating vehicular traffic and restoring the road corridor to a more natural condition. Road abandonment activities typically include controlling erosion, reestablishing hydrologic flowpaths, removing water crossing structures and associated fill materials, and preventing travel by four-wheel-drive vehicles.

REFORESTATION

Reforestation is the act of regenerating a forest stand following final harvesting. Reforestation, with the use of trees developed through common nursery practices, can be accomplished by either natural or artificial means.

SITE PREPARATION

Site preparation is work performed to prepare a harvested area for reforestation. Site preparation activities typically include piling and/or burning of slash and debris, lopping and scattering of slash and debris, and mechanical scarification.

ADAPTIVE MANAGEMENT – RESEARCH AND MONITORING

All forest practices activities described above must be conducted in accordance with the administrative requirements and protection measures described in Chapter 4 of the FPHCP. However, in order to better understand the effects of forest practices on aquatic resources and achieve the goals of the Adaptive Management program (Chapter 4), research and monitoring projects involving forest practices that deviate from standards established in the Forest Practices Act and rules are sometimes implemented. The FPHCP covers these research and monitoring projects and their associated forest practices activities.

Experimental study designs that are both more and less operationally restrictive than forest practices rules will help researchers and policymakers assess how effectively current protection measures meet established resource objectives. Because these projects will affect a small fraction of lands covered by the FPHCP (<1 percent), adverse impacts to covered species and their habitats are expected to be negligible.

The Adaptive Management program's multi-stakeholder Cooperative Monitoring, Evaluation and Research (CMER) Committee will oversee development of all experimental study designs. In most cases, study designs undergo an independent scientific peer review administered by the Adaptive Management program's Scientific Review Committee (SRC). The SRC is comprised of individuals who have experience in scientific research and who have no affiliation with the CMER Committee. Finally, as for all CMER projects, the Forest Practices Board must review and approve each research and monitoring project, including those in which forest practices deviate from established standards. More information on research and monitoring experimental designs can be found in the CMER Work Plan (Appendix H).

NON-COVERED ACTIVITIES / LANDS

Forest practices do not include forest species seed orchard operations, intensive forest nursery operations and preparatory work such as marking trees, surveying and flagging roads, and removing or harvesting incidental vegetation from forestlands, such as berries, ferns, greenery, mistletoe, herbs, mushrooms and other products that cannot normally be expected to result in damage to forest soils, timber or public resources (WAC 222-16-010). Furthermore, the application of forest chemicals—pesticides, herbicides and fertilizers (WAC 222-38) is not a covered activity.

Forest practices that are conducted in compliance with a federally approved Incidental Take Permit, incidental take statement, unlisted species agreement, candidate conservation agreement or other cooperative or conservation agreement are exempt from forest practices rules related to aquatic resources provided that: 1) the rule pertains to a species considered an aquatic resource and the species is covered by one of the aforementioned agreements, and 2) the primary risks to public resources addressed by the forest practices rules (i.e., sediment delivery to waters from roads, harvesting or mass wasting, chemical contamination of waters, inadequate recruitment of large woody debris or delivery of thermal energy to waters) are also addressed in the agreement (WAC 222-12-041). As a result, lands managed under such Federal authorizations are not considered "covered lands" under the FPHCP (See Section 1-5).

1-5 Lands covered by the plan

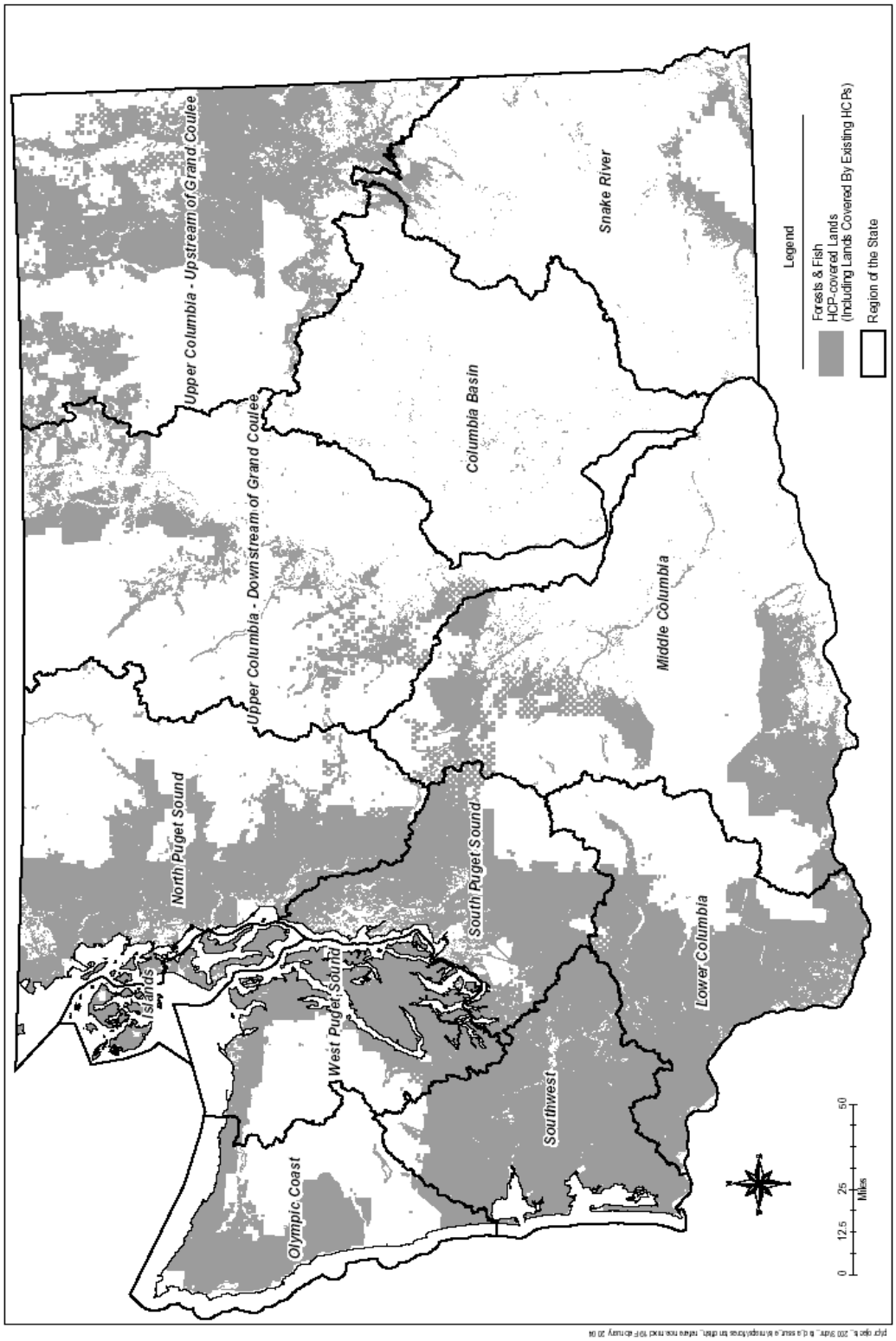
The FPHCP covers approximately 9.3 million acres of forestland in Washington, about 6.1 million acres of which are located west of the crest of the Cascade Range, and approximately 3.2 million acres are in eastern Washington. Ownership patterns range from individuals and families who own small forest parcels to large holdings owned and/or managed by private corporations and public agencies.

Covered lands are forestlands within the state of Washington subject to the Washington Forest Practices Act, chapter 76.09 RCW. Forestland means "all land which is capable of supporting a merchantable stand of timber and is not being actively used for a use which is incompatible with timber growing" (RCW 76.09.010(9)). For purposes of road maintenance and abandonment planning and implementation for small forest landowners, "forestland" does not include residential home sites, cropfields, orchards, vineyards, pastures, feedlots, fish pens and land that contains facilities necessary for the production, preparation or sale of crops, fruit, dairy products, fish and livestock.

Approximately 9.3 million acres of forestlands are covered lands; this primarily includes private and state forestlands, although local government forestlands are also covered by the FPHCP. Forestlands covered by existing federally approved habitat conservation plans are generally not considered part of FPHCP covered lands (WAC 222-12-041). However, there are two exceptions. One is the Boise Cascade single-species habitat conservation plan that encompasses 620 acres and provides coverage for the Northern Spotted owl, but does not include coverage for aquatic species. The other is approximately 228,000 acres of DNR managed land on the east side of the Cascade crest. The DNR State Lands HCP provides coverage for terrestrial species in this area, but does not include coverage for aquatic species. The forestland contained within these two areas is considered covered lands under the FPHCP.

The spatial distribution of FPHCP covered lands and their relationship to other forestlands in Washington is illustrated in Figure 1.2. Table 1.2 lists the estimated acreage of all forestlands in the state by planning region and ownership category. Planning regions have been designated in order to group lands covered by the FPHCP that have similar climatic, hydrologic, geologic and vegetative characteristics. These same planning regions are used as the basis for the accompanying EIS.

Figure 1.2 Forestlands in Washington subject to the Forest Practices Act.

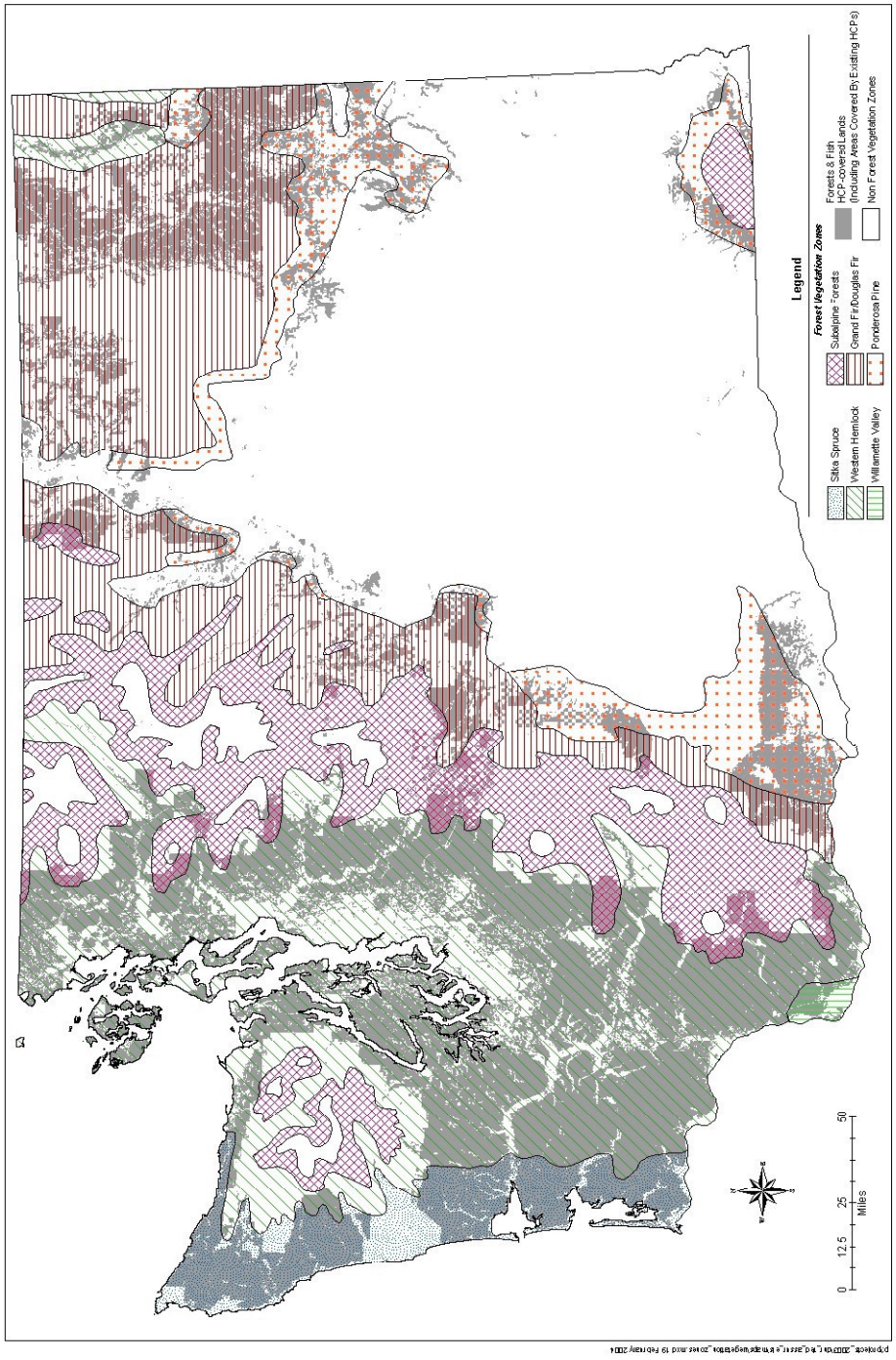


[2]

[2] Lands managed under existing HCPs are shown along with covered lands. These are not part of the FPHCP. See FPHCP Section 1-5 for a detailed description of covered lands.

Due to their wide distribution throughout the state, the lands covered by the FPHCP vary markedly in terms of their physical characteristics. Franklin and Dyrness (1973) identify five forested regions in Washington, each of which includes covered lands (Figure 1.3). The five regions include: 1) the Sitka spruce (*Picea sitchensis*) zone, 2) the western hemlock (*Tsuga heterophylla*) zone, 3) the ponderosa pine (*Pinus ponderosa*) zone, 4) the grand fir (*Abies grandis*) and Douglas-fir (*Pseudotsuga menziesii*) zones and 5) subalpine forests [including the Pacific silver fir (*Abies amabilis*), mountain hemlock (*Tsuga mertensiana*) and subalpine fir (*A. lasiocarpa*) zones (Franklin and Dyrness 1973)].

Figure 1.3 Forested regions of Washington (after Franklin and Dyrness 1973) and lands covered under the Forest Practices Habitat Conservation Plan.



3

[3] Lands managed under existing HCPs are shown along with covered lands. These are not part of the FPHCP. See FPHCP Section 1-5 for a detailed description of covered lands.

Table 1.2 Forestland area (acres) in Washington by Planning Region and Ownership category. Includes forestlands covered under the Forest Practices Habitat Conservation Plan.

	FPHCP - Covered Lands						
Planning Region	**Private**	**State**	**County**	**City**	**Sub-Total**	**Non-Covered[1]**	**TOTAL**
North Puget Sound	1,049,432	53,881	10,063	12,199	1,125,575	2,301,814	3,427,389
South Puget Sound	801,970	45,800	7,245	8,337	863,352	669,092	1,532,444
West Puget Sound	601,410	23,691	226	8,304	633,631	888,567	1,522,198
Islands	153,230	7,224	627	538	161,619	18,661	180,280
Olympic Coast	443,178	5,526	7,526	---	456,230	1,214,841	1,671,071
Southwest	1,429,408	37,602	28,629	10,903	1,506,542	551,305	2,057,847
Lower Columbia	1,277,490	46,134	1,470	---	1,325,094	1,290,622	2,615,716
Middle Columbia	634,549	236,982	20	7	871,558	2,032,870	2,904,428
Snake River	118,329	12,791	130	272	131,522	244,792	376,314
Columbia Basin	11,204	1,481	---	1	12,686	156	12,842
Upper Columbia - Downstream of Grand Coulee Dam	257,561	202,869	29	---	460,459	2,328,503	2,788,962
Upper Columbia – Upstream of Grand Coulee Dam	1,513,344	284,808	5,351	823	1,804,326	2,279,718	4,084,044
TOTAL	8,291,105	730,789	61,316	41,384	9,352,594	13,820,941	23,173,535

1 – Includes forestlands managed by Federal and tribal governments and forestlands managed under existing federally approved habitat conservation plans that cover FFR species.

1-5.1 Sitka Spruce Zone

The Sitka spruce zone stretches the length of the Washington coast and is generally only a few miles wide except where it extends up river valleys (Figure 1.3). The zone is much broader along the western side of the Olympic Peninsula, where an extensive coastal plain exists. The zone typically lies below 500 feet in elevation, although it may be found up to 2,000 feet in elevation where mountains are adjacent to the ocean. Approximately 1 million acres, or 11 percent, of lands covered by the FPHCP lie within the Sitka spruce zone.

The Sitka spruce zone has the mildest climate of any forest region in Washington. Extremes in moisture and temperature are minimal due to the proximity to the ocean. Annual precipitation averages between 80 and 120 inches, most of which falls as rain during the fall and winter months. Dominant tree species include Sitka spruce (*Picea sitchensis*), western hemlock (*Tsuga heterophylla*), western redcedar (*Thuja plicata*), Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*) and Pacific silver fir (*Abies amabilis*). Red alder (*Alnus rubra*) is common on disturbed sites, and shore pine (*Pinus contorta*) is common along the ocean.

1-5.2 Western Hemlock Zone

The western hemlock zone is the most extensive forest region in western Washington. The region is famous for its sub-climax forests of Douglas-fir and climax forests of western hemlock and western redcedar. The zone extends from British Columbia south through the Olympic Peninsula, Coast Ranges, Puget Trough and Cascade physiographic provinces (Figure 1.3). In the Cascade mountains, the western hemlock zone is found at elevations from sea level to 2,200 feet in the north and from 400 to 3,000 feet in the south. The zone lies between 500 and 1,800 feet elevation on the western slopes of the Olympic Mountains but ranges from sea level to 3,700 feet elevation on the drier eastern slopes. The western hemlock zone encompasses the largest proportion of covered lands at 4.9 million acres, or 54 percent of the total covered lands area.

The western hemlock zone has a wet, mild marine climate. Because the zone lies farther from the ocean, temperature and moisture extremes are greater than in the Sitka spruce zone. Within the zone, climatic variation is high due to differences in latitude, elevation and location with respect to mountain ranges. Annual precipitation ranges from 60 to 120 inches, most of which falls as rain during the fall and winter months.

Douglas-fir, western hemlock, and western redcedar are the dominant tree species. Pacific silver fir is common near the upper elevation limits and even well within the western hemlock zone in the North Cascade and Olympic Mountains. Grand fir, Sitka spruce and western white pine (*Pinus monticola*) occur sporadically. Red alder and bigleaf maple (*Acer macrophyllum*) are common on disturbed sites while black cottonwood (*Populus trichocarpa*) is common in riparian areas.

1-5.3 Ponderosa Pine Zone

The ponderosa pine zone occupies three areas in Washington: 1) a narrow band (10 to 20 miles wide) along the eastern flanks of the Cascade Range, 2) the Blue Mountains and 3) the Okanogan Highlands (Figure 1.3). The zone lies between 2,000 and 4,000 feet in

elevation along the eastern flanks of the Cascade Range and between 3,000 and 5,000 feet in the Blue Mountains. Lands covered by the FPHCP occur sporadically throughout the ponderosa pine zone, encompassing about 716,000 acres or 8 percent of the total covered lands area.

The ponderosa pine zone is characterized by a short growing season and minimal summer precipitation. Average annual precipitation ranges from 14 to 30 inches, much of which falls as snow during the winter months. Diurnal summer temperatures fluctuate widely, with hot days and cold nights. Winter temperatures are generally low and snow often accumulates to considerable depths.

Ponderosa pine is the climax species and is commonly associated with quaking aspen (*Populus tremuloides*) and lodgepole pine (*Pinus contorta*) throughout the zone. In the Okanogan Highlands, grand fir, Douglas-fir, western larch (*Larix occidentalis*), and western white pine are common associates, while in south-central Washington, Oregon white oak (*Quercus garryana*) is often present.

1-5.4 Douglas-Fir and Grand Fir Zones

The Douglas-fir and grand fir zones are found in eastern Washington and generally lie above the drier ponderosa pine zone but below the subalpine forests. These zones extend north from the Oregon-Washington border along the eastern slopes of the Cascade Range and across north-central and northeastern Washington (Figure 1.3). Together, the Douglas-fir and grand fir zones encompass 2 million acres of covered lands, or 22 percent of the total covered lands area.

The Douglas-fir zone is typically found between 2,000 and 4,300 feet in northeastern Washington. This zone is more mesic than the lower elevation ponderosa pine zone, with cooler temperatures and higher annual precipitation. Douglas-fir, ponderosa pine, lodgepole pine and western larch are the major tree species in the zone.

The grand fir zone usually lies above the Douglas-fir zone and has the most moderate environmental regime of any eastern Washington forest zone. Neither moisture nor temperature conditions are extreme. Precipitation is generally higher and temperatures are generally lower than in lower elevation forest zones. Major tree species in the grand fir zone include grand fir, ponderosa pine, lodgepole pine, western larch and Douglas-fir.

1-5.5 Subalpine Forests

Subalpine forests in Washington include the Pacific silver fir, mountain hemlock and subalpine fir zones (Figure 1.3). The Pacific silver fir zone is the lowest of the three zones and occupies the western slopes of the Cascade Range and all but the drier northeastern slopes of the Olympic Mountains at elevations ranging from 2,000 to 4,300 feet. The mountain hemlock zone is the highest forest zone along the western slopes and crest of the Cascade Range and in the Olympics Mountains. It generally lies between 4,100 and 6,000 feet elevation. This zone extends varying distances east across the Cascade crest until it is gradually replaced by the subalpine fir zone. The subalpine fir zone is common on secondary ranges that extend east from the Cascade crest, in the Okanogan Highlands of north-central Washington and in the Blue Mountains of southeastern Washington. Its lower elevation boundary is generally 4,900 feet in the Cascade Range and 4,200 to 5,600 feet in other areas. Because FPHCP-covered lands

generally lie at lower elevations, the subalpine forest region encompasses 304,000 acres or 3 percent of the total covered lands area, a relatively small proportion of FPHCP-covered lands.

Subalpine forests in Washington have wet, cool climatic regimes. Annual precipitation averages between 55 and 110 inches and is strongly influenced by elevation. Much of the precipitation falls as snow during the fall and winter months. Summers are cool and winters are cold, with snow cover persisting for up to six months, particularly in the mountain hemlock zone.

Typical tree species in the Pacific silver fir zone include Pacific silver fir, western hemlock, noble fir (*Abies procera*), Douglas-fir, western redcedar, and western white pine. The mountain hemlock zone is dominated by mountain hemlock, subalpine fir and lodgepole pine. Subalpine fir, Engelmann spruce (*Picea engelmannii*) and lodgepole pine are the major tree species in the subalpine fir zone.

1-6 Species covered by the plan

The Forest Practices Habitat Conservation Plan provides measures to minimize and mitigate the incidental take of five federally listed fish species that comprise 17 separate aggregations of populations[4] (Table 1.3). Listed fish species include:

- Six aggregations of chinook salmon[5] (*Oncorhynchus tshawytscha*),
- Two aggregations of chum salmon[6] (*O. keta*),
- Two aggregations of sockeye salmon[7] (*O. nerka*),
- Five aggregations of steelhead trout[8] (*O. mykiss*), and
- Two aggregations of bull trout[9] (*Salvelinus confluentus*).

The FPHCP also conserves habitat for unlisted aggregations of these same species, and for 48 other fish and seven amphibian species found in Washington for which the state is seeking unlisted species coverage (Table 1.3). Although fish and water quality protection were primary factors considered in developing the new forest practices rules, wildlife protection—especially for those species closely associated with streams on non-Federal and non-tribal forestland—was also an important consideration. Consequently, in late

[4] As used here, "aggregations of populations" refers to the NOAA Fisheries designation of "evolutionarily significant unit" (ESU) for anadromous fish species and the United States Fish and Wildlife Service designation of "distinct population segment" (DPS) for resident fish species.
[5] Upper Columbia River Spring Run ESU, Puget Sound ESU, Lower Columbia River ESU, Upper Willamette River ESU, Snake River Spring/Summer Run ESU, Snake River Fall Run ESU
[6] Columbia River ESU, Hood Canal Summer Run ESU
[7] Snake River ESU, Ozette Lake ESU
[8] Upper Columbia River ESU, Middle Columbia River ESU, Lower Columbia River ESU, Snake River ESU, Upper Willamette River ESU
[9] Columbia River DPS, Coastal-Puget Sound DPS

1997, the Timber/Fish/Wildlife (TFW) Policy Committee (Section 2.1) asked the Landscape and Wildlife Advisory Group (LWAG) of CMER to:

1) Define riparian-dependent wildlife,

2) Provide a list of those species that are considered riparian-dependent, occurring on non-Federal and non-tribal forestland in Washington,

3) Provide a description of ranges of habitat needs for those species, with consideration given to both stand-level and landscape-level factors, and

4) Provide a scientific methodology for assessing how various riparian management strategies will affect habitat needs for these species, or groups of species.

LWAG compiled information on species from research literature, species experts and available data. Each species was classified by: 1) riparian association—obligate, facultative or other; 2) whether it was a Federal and/or state species of concern; 3) whether it was affected by forest management and 4) habitat/species resiliency—high, medium, low or site-limited. LWAG recommended species with limited distribution be treated as site-specific management issues, rather than in an overall riparian strategy.

Seven amphibian species that occur in Washington were determined to be riparian obligates, to potentially be adversely affected by forest management and to have low or moderate resilience as determined through LWAG's process (Table 1.3). For further information on selection of amphibian species, see 1998 Draft report to the TFW Policy Committee on Habitat Associations of the Riparian-Dependent Amphibians, Reptiles, Birds, Mammals, and Mollusks in Commercial Forest Land of Washington State. A description of the life history, habitat requirements, status, distribution and factors affecting each covered species is included in Chapter 3.

Table 1.3 Species found in Washington State covered by the Forest Practices Habitat Conservation Plan. Includes Federal Endangered Species Act designation (endangered, threatened, unlisted) and agency with jurisdiction.

Common Name	Scientific Name	Federal Agency With Jurisdiction
Endangered Species		
Upper Columbia River spring-run chinook salmon	*Oncorhynchus tshawytscha*	NOAA Fisheries
Snake River sockeye salmon	*O. nerka*	NOAA Fisheries
Upper Columbia River steelhead	*O. mykiss*	NOAA Fisheries
Threatened Species		
Puget Sound chinook salmon	*Oncorhynchus tshawytscha*	NOAA Fisheries
Lower Columbia River chinook salmon	*O. tshawytscha*	NOAA Fisheries
Upper Willamette River chinook salmon	*O. tshawytscha*	NOAA Fisheries
Snake River spring/summer run chinook salmon	*O. tshawytscha*	NOAA Fisheries
Snake River fall run chinook salmon	*O. tshawytscha*	NOAA Fisheries
Columbia River chum salmon	*O. keta*	NOAA Fisheries
Hood Canal summer run chum salmon	*O. keta*	NOAA Fisheries
Ozette Lake sockeye salmon	*O. nerka*	NOAA Fisheries
Lower Columbia River steelhead	*O. mykiss*	NOAA Fisheries
Middle Columbia River steelhead	*O. mykiss*	NOAA Fisheries
Snake River Basin steelhead	*O. mykiss*	NOAA Fisheries
Upper Willamette River steelhead	*O. mykiss*	NOAA Fisheries
Bull Trout (Columbia River DPS)	*Salvelinus confluentus*	USFWS
Bull Trout (Coastal-Puget Sound DPS)	*S. confluentus*	USFWS

Table 1.3 (cont'd) Species covered by the Forest Practices Habitat Conservation Plan. Includes Federal Endangered Species Act designation (endangered, threatened, unlisted) and agency with jurisdiction.

Common Name	Scientific Name	Federal Agency With Jurisdiction
Unlisted Species		
Pink salmon (all ESUs)	*Oncorhynchus gorbuscha*	NOAA Fisheries
Coho salmon (all ESUs)	*O. kisutch*	NOAA Fisheries
Chinook salmon (all unlisted ESUs)	*O. tshawytscha*	NOAA Fisheries
Chum salmon (all unlisted ESUs)	*O. keta*	NOAA Fisheries
Sockeye salmon (all unlisted ESUs)	*O. nerka*	NOAA Fisheries
Kokanee (all unlisted DPSs)	*O. nerka*	USFWS
Steelhead (all unlisted ESUs)	*O. mykiss*	NOAA Fisheries
Rainbow/Interior Redband trout (all unlisted DPSs)	*O. mykiss*	USFWS
Dolly Varden	*Salvelinus malma*	USFWS
Cutthroat trout	*Oncorhynchus clarki*	USFWS
Pacific lamprey	*Lampetra tridentata*	USFWS
River lamprey	*L. ayresi*	USFWS
Western brook lamprey	*L. richardsoni*	USFWS
Pygmy whitefish	*Prosopium coulteri*	USFWS
Mountain whitefish	*P. williamsoni*	USFWS
Olympic mudminnow	*Novumbra hubbsi*	USFWS
Chiselmouth	*Acrocheilus alutaceus*	USFWS
Redside shiner	*Richardsonius balteatus*	USFWS
Longnose dace	*Rhinichthys cataractae*	USFWS
Speckled dace	*R. osculus*	USFWS
Leopard dace	*R .falcatus*	USFWS
Umatilla dace	*R. umatilla*	USFWS
Northern pikeminnow	*Ptychocheilus oregonensis*	USFWS

Table 1.3 (cont'd) Species covered by the Forest Practices Habitat Conservation Plan. Includes Federal Endangered Species Act designation (endangered, threatened, unlisted) and agency with jurisdiction.

Common Name	Scientific Name	Federal Agency With Jurisdiction
Unlisted Species (cont'd)		
Tui chub	*Gila bicolor*	USFWS
Lake chub	*Couesius plumbeus*	USFWS
Peamouth	*Mylocheilus caurinus*	USFWS
Largescale sucker	*Catostomus macrocheilus*	USFWS
Bridgelip sucker	*C. columbianus*	USFWS
Longnose sucker	*C. catostomus*	USFWS
Mountain sucker	*C. platyrhynchus*	USFWS
Salish sucker	*C. carli* (species pending)	USFWS
Three-spine stickleback	*Gasteroseius aculeatus*	USFWS
Sandroller	*Percopsis transmontana*	USFWS
Coastrange sculpin	*Cottus aleuticus*	USFWS
Prickly sculpin	*C. asper*	USFWS
Reticulate sculpin	*C. perplexus*	USFWS
Riffle sculpin	*C. gulosus*	USFWS
Shorthead sculpin	*C. confuses*	USFWS
Torrent sculpin	*C. rhotheus*	USFWS
Slimy sculpin	*C. cognatus*	USFWS
Paiute sculpin	*C. beldingi*	USFWS
Margined sculpin	*C. marginatus*	USFWS
Mottled sculpin	*C. bairdi*	USFWS
Longfin smelt	*Spirinchus thaleichthys*	USFWS
Burbot	*Lota lota*	USFWS
Green sturgeon (marine fish)	*Acipensermedirostris transmontanus*	NOAA Fisheries

Table 1.3 (cont'd) Species covered by the Forest Practices Habitat Conservation Plan. Includes Federal Endangered Species Act designation (endangered, threatened, unlisted) and agency with jurisdiction.

Common Name	Scientific Name	Federal Agency With Jurisdiction
Unlisted Species (cont'd)		
White sturgeon (anadromous marine fish)	*A. transmontanus*	NOAA Fisheries
White sturgeon (freshwater)	*A. transmontanus*	USFWS
Eulachon (marine fish)	*Theleichthys pacificus*	NOAA Fisheries
Shiner perch (marine fish)	*Cymatogaster aggreagata*	NOAA Fisheries
Pacific staghorn sculpin (marine fish)	*Leptocottus armatus*	NOAA Fisheries
Starry flounder (marine fish)	*Platichthys stellatus*	NOAA Fisheries
Surf smelt (marine fish)	*Hypomesus pretiosus*	NOAA Fisheries
Pacific sandlance (marine fish)	*Ammodytes hexapterus*	NOAA Fisheries
Pacific herring (marine fish)	*Clupea pallasii*	NOAA Fisheries
Columbia torrent salamander	*Rhyacotriton kezeri*	USFWS
Cascade torrent salamander	*R. cascadae*	USFWS
Olympic torrent salamander	*R. olympicus*	USFWS
Dunn's salamander	*Plethodon dunni*	USFWS
Van Dyke's salamander	*P. vandykei*	USFWS
Coastal tailed frog	*Ascaphus truei*	USFWS
Rocky Mountain tailed frog	*A. montanus*	USFWS

1-7 Federally listed and candidate species not covered by the plan

In addition to the species covered by the FPHCP (Table 1.3), other federally listed and candidate species are found on FPHCP-covered lands. Table 1.4 includes federally listed and candidate animal species that are not covered by the plan yet are known to occur on FPHCP-covered lands. Specific forest practices occurring within critical habitats of state-designated threatened and endangered species are classified as Class IV-Special require State Environmental Policy Act (SEPA) review and in some cases specific forest practices prescriptions are applied (WAC 222-16-080). Table 1.5 includes federally listed and candidate plant species known to occur on FPHCP-covered lands as well as species thought to be extirpated from covered lands in Washington. An overview of the status, distribution and habitat requirements of these animal and plant species is included below.

1-7.1 Federally Listed and Candidate Animals Not Covered by the Plan

COLUMBIAN WHITE-TAILED DEER

The Columbian white-tailed deer (*Odocoileus virginianus leucurus*) exists in two distinct population segments. The first is found along the lower Columbia River in southwest Washington and northwest Oregon; the second is found along the Umpqua River in Douglas County, Oregon. Both populations were listed as endangered under the Federal Endangered Species Act in 1967. In 2003, USFWS delisted the Umpqua/Douglas County population that is estimated at several thousand animals.

The Lower Columbia population numbers about 700 animals and is distributed throughout the Julia Butler Hansen Columbian White-tailed Deer National Wildlife Refuge, on the Oregon mainland, and on Crims, Lord and Fisher Islands. The islands are located within the Columbia River and are in private ownership or are managed by USFWS or the Washington Departments of Natural Resources and Fish and Wildlife. These lands lie within the Lower Columbia Planning Region (Table 1.4).

Columbian white-tailed deer prefer wet prairie and lightly wooded bottomlands or tidelands along streams and rivers. Woodlands are particularly attractive when interspersed with grasslands and pastures (NatureServe 2003). Major tree species along the Columbia River include Sitka spruce (*Picea sitchensis*), dogwood (*Cornus spp*.), black cottonwood (*Populus trichocarpa*), red alder (*Alnus rubra*), and willow (*Salix spp*.). The main factors affecting the Lower Columbia population are land conversion, timber harvesting, vehicular traffic, poaching and flooding (NatureServe 2003).

Table 1.4 Federally listed and candidate animals in Washington not covered under the Forest Practices Habitat Conservation Plan, including their occurrence on covered lands (as of January 2004).

Species	Federal Status[1]	Planning Regions[2]
Columbia white-tailed deer (*Odocoileus virginianus leucurus*)	E	LC
Woodland caribou (*Rangifer tarandus caribou*)	E	UCUS
Canada lynx (*Lynx canadensis*)	T	NP, UCDS, UCUS
Gray wolf (*Canis lupus*)	T	*
Grizzly bear (*Ursus arctos horribilis*)	T	NP, UCDS, UCUS **
Bald eagle (*Haliaeetus leucocephalus*)	T	All regions
Marbled murrelet (*Brachyramphus marmoratus marmoratus*)	T	NP, SP, WP, OC, SW, LC
Northern spotted owl (*Strix occidentalis caurina*)	T	NP, SP, WP, OC, SW, LC, MC, UCDS
Oregon silverspot butterfly (*Speyeria zerene hippolyta*)	T	SW
Columbia spotted frog (*Rana luteiventris*)	C	MC, UCDS, UCUS, SR
Oregon spotted frog (*Rana pretiosa*)	C	MC, SW, SP
Mardon skipper (*Polites mardon*)	C	MC, SP, SW
Mazama pocket gopher (*Thomomys mazama*)	C	SP, WP (WRIA 14), SW (WRIA 23)

* No known populations present, but transient wolves could occur in all regions and recovering populations in Idaho could spread to Washington.

** Population present in Selkirks (UCUS planning region). Recovery areas include parts of NP and UCDS planning regions. Transients may occur in other regions.

1 - Federal Status: E = endangered; T = threatened; C = candidate

2 - Planning Regions: NP = North Puget; WP = West Puget; SP = South Puget; OC = Olympic Coast; SW = Southwest; LC = Lower Columbia; MC = Middle Columbia; UCDS = Upper Columbia downstream of Grand Coulee Dam; UCUS = Upper Columbia upstream of Grand Coulee Dam; SR = Snake River; NA = not present on covered lands

WOODLAND CARIBOU

The woodland caribou (*Rangifer tarandus caribou*) was listed as endangered under the ESA in 1983. Currently, the population includes approximately 41 animals in the Selkirk Mountains of northeastern Washington, northern Idaho, and southeastern British Columbia. This area lies within the Upper Columbia Upstream from Grand Coulee Dam Planning Region (Table 1.4). The animals are generally found above 4,000 feet in elevation in Englemann spruce/subalpine fir and western redcedar/western hemlock forest types (USFWS 1994). Woodland caribou feed almost exclusively on tree-borne lichens. The population is threatened by habitat fragmentation and loss and excessive mortality (USFWS 1994).

CANADA LYNX

The Canada lynx (*Lynx canadensis*) was listed as threatened under the ESA in 2000. There are currently thought to be fewer than 100 individuals in the state (Stinson 2001). In Washington, lynx are primarily associated with subalpine and boreal forest types in the north-central and northeastern parts of the state. These areas lie within the North Puget and both Upper Columbia Planning Regions (Table 1.4). Most lynx habitat is on Federal lands (92 percent) and almost 40 percent is in wilderness, parks and other reserves (Stinson 2001).

Lynx are largely dependent on a single prey species, the snowshoe hare (*Lepus americanus*), but also eat small mammals, birds and carrion. The primary factors affecting populations in Washington include forest management, fire and fire suppression, insect epidemics and management of lynx harvest and habitats in southern British Columbia (Stinson 2001).

GRAY WOLF

The gray wolf (*Canis lupus*) was originally listed as endangered under the ESA in 1967, but is currently listed as threatened in Washington. Although there have been occasional reports of individual wolves in Washington, no documented breeding pairs or packs currently are known to occur in the state (WDFW 1999) (Table 1.4). However, wolves may appear in Washington within the next few years as they disperse from sites where they have recently been reintroduced in central Idaho, Wyoming and Montana. Wolves are highly adaptable and can survive in a variety of habitats, although they prefer relatively flat, open areas such as river valleys and basins (WDFW 1999). Primary prey species for wolves include elk, deer and moose. The main reasons for listing the gray wolf under the ESA include hunting and extirpation efforts in the early- to mid-1900s.

GRIZZLY BEAR

The grizzly bear (*Ursus arctos horribilis*) was listed as threatened under the ESA in 1975. Grizzly bears are rare in Washington, but there is a small population in the Selkirk Mountains (Upper Columbia Upstream of Grand Coulee Dam Planning Region) of northeast Washington (Table 1.3). Grizzly bears have also been documented in the Okanogan Highlands and in the North Cascades (Upper Columbia Downstream of Grand Coulee Dam and North Puget Planning Regions) (Table 1.4). Contiguous, relatively undisturbed mountainous habitat with a high level of topographic and vegetative diversity

is characteristic of most areas where the species exists (USFWS 1993). Direct and indirect human-caused mortality and habitat loss have caused the decline in bear numbers.

BALD EAGLE

The bald eagle (*Haliaeetus leucocephalus*) was listed as threatened under the ESA in 1967. In Washington, eagles inhabit coastal areas and river corridors throughout the state (Table 1.4). In 1998, there were 664 occupied nest sites in the state with some indications that the population has reached its carrying capacity in parts of western Washington (Stinson et al. 2001). Winter populations are higher (3,500 to 4,000 birds) due to an influx of migrants from Alaska and the Canadian provinces.

Past impacts to bald eagle populations include poaching, timber harvesting, reduced salmon runs and the use of the pesticide DDT. The greatest current threat to eagle populations in Washington is the loss of suitable nesting habitat. Eagles prefer to nest in large trees along shorelines but will utilize smaller second-growth trees (Stinson et al. 2001). Conservation of bald eagle nesting habitat is difficult because 80 percent of the land within one-half mile of shorelines is privately owned and contains desirable view property subject to development. The state bald eagle protection rule (WAC 232-12-292) requires a management plan for development, forest practices or other potentially disturbing activities on state and private lands near eagle nests and roosts (Stinson et al. 2001).

MARBLED MURRELET

The marbled murrelet (*Brachyramphus marmoratus*) was listed as threatened under the ESA in 1992. Although marbled murrelets feed primarily on fish and invertebrates in nearshore marine waters, they fly inland to nest on large limbs of mature conifers (USFWS 1997). The main cause of population decline and the primary threat to the bird in Washington is the loss and alteration of nesting habitat (older forests) as a result of timber harvesting. Other threats are mortality associated with gill-net fishing operations off the Washington coast, nest predation, oil spills and stochastic disturbances that result in loss of nesting habitat. In Washington, the murrelet is found in all nearshore marine areas, with the greatest concentrations in northern Puget Sound (Table 1.4). Nesting behavior has been documented more than 50 miles inland, though most nesting behavior occurs within 50 miles of shore throughout the breeding range (USFWS 1997). A majority of marbled murrelet sightings in the North Cascades have been within 39 miles of the coast. In 1993, no more than 5,000 birds were thought to exist in Washington (WDFW 1993).

NORTHERN SPOTTED OWL

The northern spotted owl (*Strix occidentalis caurina*) was listed as threatened under the ESA in 1990. Its range in Washington encompasses the Olympic Mountains, the Willapa Hills and the Cascade Range (both west and east sides) (Table 1.4). Preferred habitat includes structurally complex mature and old-growth coniferous forests with moderate to high canopy closure, a multi-layered, multi-species canopy with large overstory trees, a high incidence of snags or large trees with deformities, large accumulations of fallen trees and other debris, and a well-developed shrub layer. The owl's favored prey is the

northern flying squirrel (*Glaucomys sabrinus*), but it also feeds on a variety of other small mammals. Factors affecting owl populations include the loss of old-growth and late-successional forests due to timber harvesting, catastrophic fires, and spruce budworm outbreaks and competitive interactions with barred owls. Habitat losses can be exacerbated by catastrophic events such as fire, volcanic eruptions and windstorms (USDI 1992b).

OREGON SILVERSPOT BUTTERFLY

The Oregon silverspot butterfly (*Speyeria zerene hippolyta*) was listed as threatened under the ESA in 1980. In Washington, the species is found on the Long Beach peninsula in the Southwest Planning Region (Table 1.4). The butterfly occupies early successional, coastally influenced grassland habitats that contain the caterpillar host plant early blue violet (*Viola adunca*), adult nectar sources and adult courtship areas (USFWS 2001). Soil and climatic conditions, salt-spray or mist, and natural disturbances, such as fire, historically contributed to maintaining low, open grasslands within the species' range by suppressing encroaching trees and shrubs. Invasion by exotic species, natural succession, fire suppression and land development have resulted in habitat loss and modification, and represent the primary threats to the species (USFWS 2001).

COLUMBIA SPOTTED FROG

The Great Basin population of the Columbia spotted frog (*Rana luteiventris*) is currently a candidate species under the ESA. In Washington, the species is found south of the Snake River in the Blue Mountains (DNR 2004) (Table 1.4).

Columbia spotted frogs are associated with clear, slow-moving or ponded surface waters with little shade. Reproducing populations have been found in habitats characterized by springs, floating vegetation and larger bodies of pool water (e.g., oxbows, lakes, stock ponds, beaver ponds, seeps in wet meadows and backwaters) (USFWS 2002a). Primary threats to the species include human-induced changes in hydrology, water quality and wetland integrity. Non-native fish and Bullfrogs (*Rana catesbeiana*) are also a potential threat as is the loss of beaver ponds and associated habitats (DNR 2004).

OREGON SPOTTED FROG

The Oregon spotted frog (*Rana pretiosa*) is currently a candidate species under the ESA. The historical range in Washington is the Puget Trough and the southern portion of the western Cascade mountains. Only four populations are known to exist: two in Thurston County and two in Klickitat County (DNR 2004) (Table 1.4).

Oregon spotted frogs are highly aquatic and rarely found far from water. Populations are typically found in large, shallow wetland systems associated with a stream or stream network. Waters that remain aerobic and do not freeze to the sediments are necessary for winter survival in areas with colder climates. Beaver-impounded systems appear to provide many of the habitat requirements for the species. Primary threats include human-induced changes in hydrology, water quality and wetland integrity. Non-native fish and Bullfrogs are also a potential threat, as is the loss of beaver ponds and associated habitats (DNR 2004).

MARDON SKIPPER

The Mardon skipper (*Polites mardon*) is currently a candidate species under the ESA. In Washington, this small, non-migratory butterfly occurs in the South Puget Sound and southern Cascade mountains (Table 1.4). In the South Puget Sound, the species is found in open, glacial outwash grasslands, while in the southern Cascade mountains, it inhabits small, open grassland sites within ponderosa pine savanna/woodland (USFWS 2002b). Degradation of grassland habitats has been identified as the primary threat to the species, including development, overgrazing, herbicides, the encroachment or invasion of non-native and native vegetation, and succession from grassland to forest (USFWS 2002b).

MAZAMA POCKET GOPHER

The Mazama pocket gopher (*Thomomys mazama*), also known as the western pocket gopher, is currently a candidate species under the ESA. Eight subspecies are recognized in Washington, two of which may be extinct. Of the remaining six subspecies, five may be renamed as one species (USFWS 2002c). In Washington, Mazama pocket gophers are associated with glacial outwash prairies in the western part of the state (Table 1.4). Their diet includes a variety of plant material including leafy vegetation, succulent roots, shoots and tubers. Although as consumers of crop plants they are considered agricultural pests, in natural settings they play an ecological role by aerating soils and stimulating plant growth. In prairie ecosystems, pocket gopher activity is important in maintaining species richness and diversity (USFWS 2002c).

The primary threat to the species is the loss, modification or curtailment of its habitat or range, including fire suppression and associated invasion of prairies by Douglas-fir (USFWS 2002c). Prairie habitat in the South Puget Sound area is one of the most rare habitats in the United States, having been reduced by 90-95 percent over the last 150 years (USFWS 2002c). Most populations of Mazama pocket gophers occur on private lands, although several populations are known to exist on public lands including Olympic National Park, Fort Lewis, Scatter Creek Wildlife Area and lands owned or managed by the Port of Shelton and the City of Tacoma (USFWS 2002c).

1-7.2 Federally Listed and Candidate Plants Not Covered by the Plan

MARSH SANDWORT

Marsh (or swamp) sandwort (*Arenaria paludicola*) was listed as endangered under the ESA in 1993. The species is thought to be extirpated from Washington and is only known to exist in two sites in San Luis Obispo County, California. In Washington, available natural heritage records indicate the plant was historically found in Grays Harbor, King, and San Juan counties (NatureServe 2003) (Table 1.5). The plant inhabits freshwater wetlands and marshes, mostly along the coast, from close to sea level to 1,500 feet in elevation. Threats to existing California populations include changes in hydrology due to well drilling, water uptake by other species, drought, invasion of non-native species, competition, urban and agricultural development and off-road vehicle use.

Table 1.5 Federally listed and candidate plants in Washington not covered under the FPHCP, and their distribution on FPHCP-covered lands (as of January 2004).

Species	Federal Status[1]	Current Distribution[2]	Potential Distribution[3]
Marsh sandwort (*Arenaria paludicola*)	E	N/A[4]	NP, WP, SP, OC, SW
Showy stickseed (*Hackelia venusta*)	E	UCDS	UCDS
Bradshaw's desert-parsley (*Lomatium bradshawii*)	E	LC	LC, SW
Wenatchee Mountains checker-mallow (*Sidalcea oregana* var. *calva*)	E	UCDS	UCDS
Golden paintbrush (*Castilleja levisecta*)	T	SW, IS	LC, SW, SP, NP, WP, IS
Water howellia (*Howellia aquatilis*)	T	SP, SR, UCUS	UCUS, SR, SPS, SW, LC
Nelson's checker-mallow (*Sidalcea nelsoniana*)	T	SW, LC	SW, LC, SPS
Kincaid's lupine (*Lupinus sulphureus* ssp. *kincaidii*)	T	SW	SPS, LC, SW
Spalding's catchfly (*Silene spaldingii*)	T	SR, UCUS, CB	SR, UCUS, CB
Slender moonwort (*Botrychium lineare*)	C	UCUS	UCUS, UCDS

1 – E = endangered; T = threatened; C = candidate

2 – Planning Region(s) in which the species is currently found; NP = North Puget; WP = West Puget; SP = South Puget; OC = Olympic Coast; SW = Southwest; LC = Lower Columbia; MC = Middle Columbia; UCDS = Upper Columbia downstream of Grand Coulee Dam; UCUS = Upper Columbia upstream of Grand Coulee Dam; SR = Snake River

3 – Planning Region(s) in which the species could potentially occur; NP = North Puget; WP = West Puget; SP = South Puget; OC = Olympic Coast; SW = Southwest; LC = Lower Columbia; MC = Middle Columbia; UCDS = Upper Columbia downstream of Grand Coulee Dam; UCUS = Upper Columbia upstream of Grand Coulee Dam; SR = Snake River

4 – Species is extirpated in Washington

SHOWY STICKSEED

Showy stickseed (*Hackelia venusta*) was listed as endangered under the ESA in 2002. The species' range is limited to the Wenatchee Mountains in Chelan County, Washington (Table 1.5). It inhabits dry, loose, granitic sand and crevices in granite or talus from 1,500 to 2,500 feet in elevation. Primary threats to the species include both fire suppression and fire. Fire suppression allows plant succession to proceed resulting in increased competition and slope stabilization. Fire may lead to an increased frequency of landslides that may bury much of the population (DNR 2000).

BRADSHAW'S DESERT-PARSLEY

Bradshaw's desert-parsley (*Lomatium bradshawii*) was listed as endangered under the ESA in 1988. In Washington, the species is endemic to the southern portion of the Puget Trough and currently occurs in only two known locations, both in Clark County (Table 1.5). The species occurs in remnant fragments of once-widespread, low-elevation grasslands and prairies. The habitat type is described as wet, seasonally flooded grasslands and prairies common along streams and rivers. Fires have been important in maintaining plant communities by reducing or eliminating invasion by woody species and by reducing the accumulation of grasses and herbaceous litter. Primary threats include residential and commercial development and associated changes in hydrology and fire suppression (DNR 2000).

WENATCHEE MOUNTAINS CHECKER-MALLOW

Wenatchee Mountains checker-mallow (*Sidalcea oregana*) was listed as endangered under the ESA in 1999. The species' range is limited to an area of approximately 33 square miles, extending south-southeasterly from Leavenworth, Washington (Table 1.5). The plant is most abundant in moist meadows that have surface water or saturated upper soil horizons into early summer. Historically, fire probably played a role in maintaining suitable habitat for the species by improving light and soil moisture conditions and keeping succession in check. Threats to the species include rural residential development, alterations to hydrology, grazing, timber harvesting and a variety of recreational pursuits (DNR 2000).

GOLDEN PAINTBRUSH

Golden paintbrush (*Castilleja levisecta*) was listed as threatened under the ESA in 1997. The plant's historic range extended from the southern tip of Vancouver Island, British Columbia to Linn County, Oregon. In Washington, the species occurs in open grasslands in the Puget Trough (Table 1.5). Golden paintbrush prefers sun and can tolerate partial shade, but will not tolerate a closed canopy. Fire is thought to have played a historic role in maintaining the open prairie habitats occupied by the species. Primary threats include invasion of the plant's habitat by Douglas-fir and the non-native Scot's broom (DNR 2000).

WATER HOWELLIA

Water howellia (*Howellia aquatilis*) was listed as threatened under the ESA in 1994. The species is currently found in California, Montana, Idaho and Washington and was historically present in Oregon. In Washington, water howellia occurs within the Columbia Basin and Puget Trough (Table 1.5). In the Puget Trough, it is found in the western hemlock zone as defined by Franklin and Dyrness (1973) in low elevation wetlands. It occurs mostly in small, vernal ponds, although some ponds may retain water throughout the year. Primary threats to the species include changes in wetland hydrology, an increase in weedy species such as reed canarygrass, invasion by noxious weeds, livestock grazing and timber harvesting on adjacent uplands (DNR 2000).

NELSON'S CHECKER-MALLOW

Nelson's checker-mallow (*Sidalcea nelsoniana*) was listed as threatened under the ESA in 1993. The species occurs from Benton County, Oregon, north to Lewis County, Washington. In Washington, the species is found on the Olympic Peninsula and in the southwest part of the state within the western hemlock zone as defined by Franklin and Dyrness (1973) (Table 1.5). It inhabits streamside areas in meadows and other relatively open areas such as roadsides. It is generally found in areas where prairie or grassland remnants persist, such as along fencerows, drainage ditches and at the edges of plowed fields adjacent to wooded areas. Threats to the species include mowing, plowing, stream channel alteration, recreational activities, fire suppression and roadside spraying (DNR 2000).

KINCAID'S LUPINE

Kincaid's lupine (*Lupinus sulphureus*) was listed as threatened under the ESA in 2000. The plant ranges from Douglas County, Oregon, north to Lewis County, Washington. In Washington, it is currently known in two locations less than a mile apart (Table 1.5). It inhabits native upland prairies and open oak woodlands. These habitats were historically maintained by periodic disturbance including fire. Primary threats to the species include agricultural activities, urban development, roadside maintenance and herbicide application (DNR 2000).

SPALDING'S CATCHFLY

Spalding's catchfly (*Silene spaldingii*) was listed as threatened under the ESA in 2001. Its range includes eastern Washington, northeast Oregon, Idaho and western Montana. In Washington, it is found in the Blue Mountains and Columbia Basin in Asotin, Lincoln, Spokane and Whitman counties (Table 1.5). The plant occurs primarily in open grasslands with a minor shrub component and occasionally with scattered conifers. Fire may have historically played a role in maintaining habitat, particularly on sites that are interspersed with ponderosa pine (*Pinus ponderosa*) forest. Livestock grazing and recreational activities have the potential to further degrade existing habitat (DNR 2000).

SLENDER MOONWORT

Slender (or skinny) moonwort (*Botrychium lineare*) is a candidate species under the ESA. Its range includes Idaho, Montana, California, Oregon, Colorado, Quebec and New Brunswick. In Washington, it is known from only one occurrence in Ferry County in the Okanogan Highlands (Table 1.5). The species is found in deep grass and forbs of meadows, under trees in woods and on shelves of limestone cliffs, mainly at higher elevations. The one known occurrence in Washington is within a western redcedar/Douglas-fir stand on a floodplain adjacent to a stream. The primary threat to the single Washington occurrence is livestock grazing (DNR 2000).