

1 Introduction to the NFHCP

Laying the Foundation

In 1993, as attention began to be focused on the status of bull trout in the West and the species was being reviewed for federal listing under the Endangered Species Act (ESA), Plum Creek began a comprehensive survey and inventory for bull trout on company lands. This was the first such effort by any nonfederal landowner within the range of the species. More than 1,400 stream kilometers in Montana, Idaho, and Washington were searched between 1993 and 1997 with methodologies that included snorkeling, electro-fishing, and habitat data collection. Data obtained from that effort were shared with state and federal agencies and became the basis for Plum Creek's continued research and watershed analysis efforts. The result of this research was published in the North American Journal of Fisheries Management (Watson and Hillman 1997 [Technical Report #2]), and serves as one of 13 Plum Creek technical reports.

In June 1997, Plum Creek met with the U.S. Fish and Wildlife Service (FWS) to discuss the development of a Habitat Conservation Plan (HCP) for bull trout for Plum Creek lands. This was nearly a year before the FWS listed the species in June 1998. The scope of the HCP was later expanded to address all native salmonid species known or

The Purpose of this Document and How It Works

If a company like Plum Creek believes that its activities may negatively affect the habitat of species that are listed as threatened or endangered under the ESA, they are required to avoid "take" of individuals of the species. Another way of complying with the ESA is to acquire an Incidental Take Permit (ITP) that allows a minor amount of "take" in exchange for conservation for the species as a whole. A necessary part of this voluntary approach is for the company to specify the conservation in a Habitat Conservation Plan (HCP), which must meet a number of legal requirements.

An HCP is written by the applicant (sometimes with the help of the government) and attached to the application for an ITP. The government then evaluates the HCP using a completely separate document, in this case, an Environmental Impact Statement (EIS).

Many of the requirements for an HCP are the same as (or overlap) those for an EIS, requiring much duplication of effort between the two documents. Recognizing this, the government recommended that a combined document be written to avoid repetition and save paper. Plum Creek agreed. Therefore, the larger combined document contains both Plum Creek's Native Fish Habitat Conservation Plan (NFHCP) and the government's EIS.

The majority of Plum Creek's NFHCP is in this part, the back end of Chapter 3 of the combined EIS/NFHCP document, where all of the NFHCP commitments are described. This portion is referred to as the NFHCP. Other required elements of the NFHCP are scattered throughout this combined EIS/NFHCP document (see Table NFHCP1-1 for specific locations).

Because the NFHCP alternative is Plum Creek's proposal, its appearance differs somewhat from the rest of the document, which was prepared primarily by agencies of the federal government (the U.S. Fish and Wildlife Service and the National Marine Fisheries Service).

In the NFHCP, Plum Creek's conservation commitments are shown within full-width text boxes to highlight the specifics of the commitment. The surrounding text provides support for those commitments as well as a discussion of the scientific and managerial rationale used in designing the commitment.

Also, there are partial width shaded sidebar boxes, such as this one, that provide useful sidelights about Plum Creek programs. These are intended for context and to further educate the reader but are not a part of the legal terms of the NFHCP.

suspected to occur in Montana, Idaho, and part of Washington, and is called the Native Fish Habitat Conservation Plan (NFHCP).

Plum Creek was uniquely positioned to initiate an HCP for bull trout and other native salmonids for several reasons. First, Plum Creek is possibly the largest private owner of bull trout habitat within the current range of the species. The nature of Plum Creek’s “checkerboard” ownership with federal lands ensures that the issue of appropriate bull trout management measures would arise in access, land exchange and other matters requiring coordination between owners in such a mixed ownership pattern. Second, Plum Creek had already compiled a significant body of information about the biology and distribution of the species on its lands. Finally, Plum Creek was gaining familiarity with the HCP process in other areas of Plum Creek ownership through initiatives such as Plum Creek’s Central Cascades HCP.

Over the past 2 years, Plum Creek, the FWS and the National Marine Fisheries Service (NMFS; collectively referred to as the “Services”) have examined field conditions, conducted workshops with outside scientists, conducted public meetings, and collaborated in the preparation of this document. Additionally, the Services provided technical assistance to the team of scientists assembled by Plum Creek to prepare 13 peer-reviewed technical reports that addressed many issues ranging from bull trout research to road design and habitat modeling (described in more detail later in this section).

Taken together, the scientific preparation, public involvement, and Plum Creek’s long-term experience with land and forest management laid the foundation for the NFHCP. This HCP is more than merely a “mitigation plan” to compensate for the impact to a listed species or its

The Five Points Policy

The Services have proposed changes to their HCP Handbook to improve HCPs. These improvements are described in the following five points:

Establishing measurable biological goals and objectives. HCPs should include broad biological goals as guiding principles as well as specific objectives as measurable targets for success.

Incorporating adaptive management into an HCP when there are significant biological data gaps or uncertainty. Adaptive management is an approach that allows new science to be incorporated into conservation plans. When an HCP incorporates an adaptive management strategy, the agreement would clearly state the range of possible adjustments and the circumstances under which these adjustments would be triggered. This provides additional flexibility in managing a species in the future. It also allows the applicant to assess the potential economic impacts of the adjustments before agreeing to the HCP.

Developing better monitoring strategies. Monitoring strategies will be improved and made more consistent to better determine whether a permittee is complying with the HCP, whether biological goals and objectives are being met, and whether adaptive management provisions should be triggered.

Increasing public participation in the HCP process. This would provide for comment periods for HCPs greater than those required by regulation to provide the public with greater opportunity to assess, review, and critique plans that have been developed.

Providing guidance on determining duration of incidental take permits. The permit duration should take into account the duration of the applicants activities as well as the biological time frames that are important in determining the survivability of the covered species.

Plum Creek and the Services have worked to insure that the NFHCP reflects the intent of this new guidance.

habitat. It is also a business plan for the company that is based on credible science and is economically viable and operationally feasible.

What is the Native Fish Habitat Conservation Plan?

A Habitat Conservation Plan (HCP) is part of a process outlined by Section 10 of the ESA that involves cooperation between the federal government and a private landowner. The ESA prohibits landowners from “taking” a species listed as threatened or endangered; that is, landowners are prohibited from directly killing an individual or taking away its habitat. There is often legal or scientific uncertainty as to what constitutes a “take” might actually be and this can create uncertainty for landowners that may be counterproductive to conservation efforts. For instance, if a landowner feels that an economic opportunity on the property might be threatened because of the potential for a “take,” there might be a negative incentive that results in withholding valuable information from the government. Therefore, under the HCP program, the federal government offers to work with landowners in a “creative partnership” to develop a conservation plan for their property as a part of issuing them an incidental take permit (ITP) to solve the uncertainty over “take” by granting permission to “take” under specified circumstances.

So why would the federal government want to give permission to “take” a listed species when a law was passed to prohibit it? It is looking for opportunities to increase the success of the greater goal of recovering species as a whole by offering incentives to private landowners to enlist their active participation in recovery efforts. The ITP allows incidental taking of some individuals in exchange for signed conservation commitments that better benefit the listed species as a whole. Those conservation commitments are described in a Habitat Conservation Plan such as this one. The requirements for issuing an ITP are discussed in more detail in Chapter 1 of the EIS.

Landowners may be willing to respond to the government’s offer and voluntarily make long term investments in costly conservation commitments for two reasons. First, the ITP provides legal certainty over the difficult legal issue of “take.” Secondly, the landowner can receive assurances from the government that it will not require additional land or money for the ITP for the life of the permit. This is because of an ESA rule known as “No Surprises.” [“No Surprises” Final Rule for Habitat Conservation Planning and Incidental Take Permitting in 1998 (FR 1998b)]. Plum Creek is interested in both of these incentives because they provide confidence for long term business planning and investments.

The Native Fish Habitat Conservation Plan (NFHCP) is the specific name of this particular HCP. The scope of the NFHCP is described in detail in Chapter 1 of the EIS. It applies to the NFHCP Project Area that includes 1.6 million acres of Plum Creek land in Montana, Idaho, and Washington as well as the access roads leading to those lands upon which Plum Creek has some management responsibility. The EIS evaluates the NFHCP within the context of a 17 million acre Planning Area. As described in the opening sidebar article, the NFHCP and the EIS that evaluates the environmental effects of the NFHCP are combined into one document because they share many elements in common. This portion of the combined document (the latter part of Chapter 3) describes the specific conservation **commitments of the NFHCP**. All of the elements of the NFHCP (i.e., those that would be included in the

NFHCP if it was a stand-alone document) are listed together with their location within the combined EIS/NFHCP document in Table NFHCP1-1.

TABLE NFHCP1-1

Elements of the NFHCP and Their Location within the Combined EIS/NFHCP Document

Required Element of the NFHCP	Location in the Combined Document
A description of the activities covered by the incidental take permit (ITP)	EIS Chapter 2.3.1; NFHCP Section 1
A description of the lands covered by the ITP	EIS Chapter 2.2
A description of the species covered by the ITP	EIS Chapters 1.3.2 and 4.6; NFHCP Section 1
The term of the ITP	EIS Chapter 1.3.2
An evaluation of the impacts on the species covered by the NFHCP and ITP	EIS Chapter 4.6
Measures taken to minimize take and provide conservation for the covered species	The NFHCP (latter part of Chapter 3), described within commitment boxes throughout.
Reporting requirements	NFHCP Section 7
Monitoring requirements	NFHCP Sections 7 and 8
Glossary of terms	EIS Chapter 8
Literature cited	EIS Chapter 7
Measures to ensure adequate funding for the NFHCP	EIS Appendix A—Implementing Agreement
Alternatives to the NFHCP that were considered by Plum Creek and the reasons why they were not selected	EIS Chapters 3.1.2 and 5.3
Other measures that the Services may require as being necessary or appropriate for purposes of the NFHCP.	NFHCP, incorporated as part of the commitments described within the commitment boxes.
Adaptive Management; how new science will be used to update conservation measures, if needed.	NFHCP Section 8
The Implementing Agreement; the legal contract between Plum Creek and the Services	EIS Appendix A
Procedures to deal with unforeseen and changed circumstances	NFHCP Section 8

Covered Species. Covered species (also referred to as Permit species in the EIS) are the species covered by the ITP and subject to its take authorization. Plum Creek’s intent is to acquire ITP coverage and provide conservation for all native salmonids in the Planning Area, whether they are listed under the ESA or not. Although Plum Creek believes its activities would not result in “take,” Plum Creek does acknowledge that some of its management activities can affect fish habitat. The intent of the HCP is to present an ecosystem approach that benefits all native salmonids and other fish and wildlife in the Project Area. However, because the Services require that covered species be listed on the permit individually, the

covered species are listed below and addressed individually in the EIS in both Chapter 1 and Chapter 4.

- Bull trout (*Salvelinus confluentus*)
- Westslope cutthroat (*Oncorhynchus clarki lewisi*)
- Coastal cutthroat, above and below dams (*Oncorhynchus clarki clarki*)
- Redband trout (*Oncorhynchus mykiss*)
- Coastal rainbow trout (*Oncorhynchus mykiss*)
- Three subpopulations of steelhead (*Oncorhynchus mykiss*)
- Five subpopulations of chinook salmon (*Oncorhynchus tshawytscha*)
- Pygmy whitefish (*Prosopium coulteri*)
- Mountain whitefish (*Prosopium williamsoni*)
- Chum salmon (*Oncorhynchus keta*)
- Coho salmon (*Oncorhynchus kisutch*)

Covered Activities: Covered activities are those activities for which incidental take is permitted under an ITP. Plum Creek owns and manages forest lands for the production of logs to be manufactured into forest products in Plum Creek mills or sold to other forest products manufacturers. In conducting their business, Plum Creek engages in a wide variety of activities, some of which could present a risk to one or more of the covered species:

- Commercial forestry and associated activities
- Forest fire suppression
- Open range and leased cattle grazing
- Miscellaneous forest product sales
- Conservation activities
- Special forest use permits
- Forest products manufacturing

Plum Creek is seeking ITP coverage for these activities. The covered activities are described in more detail in Chapter 2 of the EIS.

Biology and Business: Setting Goals

In order for an HCP to work, it must creatively explore opportunities for conservation that consider both biology and business. An HCP can enlist the contribution of a landowner toward conservation because it allows the landowner to consider his or her own land ownership objectives when designing measures that effectively benefit the species. In the case of the NFHCP, Plum Creek has developed goals for both the biological needs of fish and the long-term business needs of Plum Creek.

Building on the Needs of Fish: The “Four C’s”

The Services finalized their **Five Points Policy** (FR 2000) that contains more specific guidance for incorporating biological goals, adaptive management, and monitoring into habitat conservation plans. The NFHCP incorporates many of the concepts and

recommendations of the Services' Five Points Policy guidance. The policy states that "the best HCPs clearly define the desired outcome for the covered species and their habitats in terms of biological goals and objectives":

***Biological goals** are the broad guiding principles for the operating conservation program; they are the rationale behind the minimization and mitigation strategies.*

***Specific biological objectives** are subsets of the biological goals and represent specific measurable targets for achieving the goals of the operating conservation program. Thus biological goals and objectives can be stated in a step-down approach based on the best scientific information available and reflect the needs of the covered species.*

To develop a conservation approach for native fish, Plum Creek worked with the Services to develop goals and specific objectives for the NFHCP by examining the needs of native fish species and considering how Plum Creek management activities could affect those needs.

Bull trout and other native salmonids generally prefer habitat that consists of **C**old, **C**lean, **C**omplex, and **C**onected water (the "Four C's"). These general habitat characteristics are the basis for the biological goals of the NFHCP. While the needs of all native salmonids in the Project Area are similar, bull trout are habitat specialists, having more specific and demanding habitat requirements than other native salmonids. This conservation package, therefore, applies conservation commitments that benefit all native salmonids in the Project Area and focuses certain commitments on the specialized needs of bull trout. The general

goal of these commitments is to protect the Four C's by minimizing the impacts of Plum Creek's current forestry activities on habitat, as well as by improving habitat degraded by past practices.



The ultimate goal of supporting or restoring viable fish populations may be met by developing broad goals, specific habitat objectives, and conservation commitments to be implemented that will meet the objectives. Plum Creek management activities are only a part of a complex spectrum of factors that affect fish, and the primary influence of Plum Creek's activities

is on habitat. Therefore, the next level of the pyramid is based on habitat needs: the Four C's form the **broad biological goals** that become the guiding principles of the NFHCP. The emphasis of the biological goals is to ensure that Plum Creek's activities will maintain habitat quality where it is suitable for Permit species and improve habitat quality where it currently may be unsuitable. **Suitable** habitat is defined as the range of environmental factors that support conditions conducive to breeding, feeding, sheltering, and migration that will ultimately contribute to the long-term survival of Permit species. Conversely, **unsuitable** habitat is defined as being outside of that suitable range of environmental factors. On the third level, in order to focus attention where Plum Creek management may have the most direct effects, **specific habitat objectives** were developed to support the broad goals. The Adaptive Management section describes how habitat objectives will be measured in the

NFHCP to evaluate whether the biological goals are being met. There are 15 habitat objectives (Table NFHCP1-2). To the extent possible, these become the measurable targets for the plan upon which success is measured. Finally, the NFHCP contains 53 **individual conservation commitments** that form the broad base of conservation beneath the specific objectives. The result is a solid approach to conservation with a foundation built from Plum Creek conservation commitments.

Using this pyramid approach, the biological goals and specific habitat objectives listed in Table NFHCP1-2 were developed for the NFHCP.

TABLE NFHCP1-2
Biological Goals and Objectives of Plum Creek's NFHCP

Biological Goal	Specific Habitat Objectives
<p>Cold</p> <p>Protect stream temperatures where they are suitable for fish and contribute to restoration of temperatures where past Project Area management has rendered them unsuitable.</p>	<ol style="list-style-type: none"> 1. Minimize impacts to canopy closure and changes in channel morphology resulting from riparian timber harvest and grazing. 2. Improve the ability of riparian vegetative communities to provide canopy closure over streams through passive and active restoration. 3. Create a net increase in canopy closure over streams.
<p>Clean</p> <p>Protect instream sediment levels where they are suitable for fish and contribute to restoration of instream sediment levels where they have been impacted by past Project Area management.</p>	<ol style="list-style-type: none"> 4. Minimize sediment delivery to streams resulting from the construction of new roads and timber harvesting. 5. Reduce sediment delivery to streams from existing roads. 6. Create a net reduction in sediment delivery to streams. 7. Contribute to restoration of the function of riparian vegetative communities for sediment filtration and streambank stability.
<p>Complex</p> <p>Protect instream habitat diversity where it is suitable for fish and contribute to restoration of instream habitat diversity where it has been impacted by past Project Area management.</p>	<ol style="list-style-type: none"> 8. Minimize impacts to large woody debris recruitment and bank stability in harvested streamside stands. 9. Minimize impacts to overhanging stream banks because of grazing or riparian harvest. 10. Improve the ability of riparian forests to provide a broad range of riparian functions to streams. 11. Improve the ability of riparian vegetative communities to develop overhanging banks and other habitat diversity through passive or active restoration. 12. Create a net increase in large woody debris recruitment potential and other riparian functions in the Project Area.
<p>Connected</p> <p>Protect and contribute to restoration of connectivity among sub-populations of native fish in the Project Area.</p>	<ol style="list-style-type: none"> 13. Avoid creating fish passage barriers when constructing stream crossings. 14. Restore fish passage where existing road stream crossings restrict passage. 15. Cooperate to restore fish migration where restricted by other factors, such as irrigation diversions or thermal barriers.

Forestry: A Long-Term Business

Commercial forestry is a long-term business that may require 60 years or more to see a return on its investment. While any business can plan more effectively when it can predict regulations it will face, predictability is particularly critical to commercial forestry investments because of the long-term nature of those investments. Thus, because long-term business confidence is central to Plum Creek’s motivation in developing the NFHCP, it is important that, in addition to biological goals, business goals be used to help judge the desirability of alternative conservation measures. Table NFHCP1-3 summarizes Plum Creek’s business goals, specifically developed for the NFHCP (referred to as the NFHCP business goals).

TABLE NFHCP1-3
Plum Creek’s NFHCP Business Goals

NFHCP Business Goals	Specific Business Objectives
<p>Long-Term Sustainability and Business Certainty</p> <p>Create an environment of regulatory predictability to preserve the ability to confidently make long-term business decisions.</p>	<ol style="list-style-type: none"> 1. Retain the ability to manage timber and land resources in a profitable manner over a long-term planning horizon. 2. Protect certainty and confidence for long-term business planning and investment.
<p>Cost-Effective Conservation</p> <p>Implement cost-effective conservation so that finite resources can be allocated where they provide the most benefit.</p>	<ol style="list-style-type: none"> 3. Exploit opportunities to provide the greatest amount of conservation for the least amount of cost. 4. Ensure actual, measurable conservation benefits are commensurate with expenditures. 5. Minimize increases in logging and harvesting costs.
<p>Scientific Credibility</p> <p>Apply a high level of scientific rigor to the task of generating creative solutions.</p>	<ol style="list-style-type: none"> 6. Apply conservation resources where there is the greatest scientific certainty of a conservation benefit. 7. Base conservation actions and decisions on rigorous, credible data. 8. Utilize increased scientific understanding to improve the ability of the NFHCP to better meet business goals while continuing to meet biological goals.
<p>Operational Practicality and Flexibility</p> <p>Ensure a high degree of implementation success by developing a plan that is practical to implement and preserves management flexibility.</p>	<ol style="list-style-type: none"> 9. Develop commitments that can be clearly understood and easily implemented by loggers and foresters. 10. Retain the flexibility to adjust harvest plans on short notice and respond to changing market conditions. 11. Maintain opportunity and flexibility to conduct land transactions that improve land ownership patterns or facilitate creative transactions with a conservation outcome.

The maximum extent practicable. In developing commitments for an HCP that would allow an incidental take permit to be issued, the ESA requires an applicant to “minimize and mitigate the impacts” of the authorized incidental taking “to the maximum extent practicable.” The Services, therefore, are required not merely to acknowledge that

conservation is being provided by the HCP, but that it is to the “maximum extent practicable,” which can be a subjective standard. This HCP was developed as a voluntary and proactive opportunity under the ESA rather than in response to shutdowns or costly emergency state regulation. Because determining the maximum practicable conservation that could be offered can be difficult, Plum Creek has developed the NFHCP business goals to aid in the determination of the “maximum extent practicable” criterion. Here is an example for each of the business goals:

1. Long-term sustainability: Conservation measures that promote a short-term management focus are not practicable for a long-term business like forestry.
2. Cost-effective conservation: Commonly, a conservation approach has a point of diminishing returns where increasing costs achieve a diminishing conservation benefit. It is not practicable to expend finite resources for conservation measures that have very little benefit, especially when those resources can be allocated somewhere else at a greater conservation benefit.
3. Scientific credibility: Plum Creek managers are willing to invest in conservation if there is reasonable scientific certainty of a conservation benefit. It is not practicable to expect business managers to invest where there is little certainty of a return on the investment.
4. Operational practicality: Some conservation strategies have been criticized because, while they may work in theory, they may be so complex or academic as to be unworkable on the ground. Conservation measures that are too complicated or time consuming for foresters and loggers to understand and implement are not practicable.

Thus, the conservation measures of the NFHCP, including monitoring and adaptive management, are a combination of the NFHCP biological goals, practicability considerations represented by the NFHCP business goals, and a solid basis of scientific data and rationale, while addressing additional concerns, uncertainties, and collaborative input from the Services. The resulting package of commitments provides not only a significant conservation benefit, but does so mostly within these standards of practicability, thereby meeting the “maximum extent practicable” test.

Focusing Conservation

The NFHCP business goals require conservation planning to take a close look and determine where resources can be best allocated to obtain the maximum conservation gain. Therefore, Plum Creek and the Services sought opportunities to focus conservation. In some cases this means identifying specific stream segments that have higher sensitivity to management, while in others it may mean prioritizing entire watersheds for increased protection because of a specific concern such as sediment. These will be described as a part of the NFHCP commitments. Another approach for focusing conservation is to address specific species because of their unique needs or imperiled status. While the NFHCP is intended to provide conservation benefits for all native salmonids, Plum Creek categorized their lands and streams based upon bull trout biology early in the NFHCP development. It was felt that this would be a good basis for prioritizing conservation measures because bull trout have more

demanding habitat requirements and are more of a habitat specialist than the other covered species. In some parts of the Project Area they are also more imperiled. While this approach was retained to some extent, the Services encouraged Plum Creek, as the planning process proceeded, to build into the NFHCP other methods of focusing conservation to ensure that the needs of all of the covered species are met.

The various approaches for focusing conservation are described throughout the NFHCP while certain broad categories are described here:

- **Tier 1 Watersheds** are those watersheds that contain streams known to be important for bull trout spawning and juvenile rearing. This part of the life cycle of bull trout is particularly sensitive and has the most specific habitat needs. About 20 percent of Plum Creek lands in the NFHCP Project Area occur within Tier 1 watersheds. A provision is included in the NFHCP that allows Plum Creek and the services to collaboratively designate new Tier 1 watersheds as new fish distribution or status information becomes available. New Tier 1 designations can be made for the conservation of any of the Permit species.
- **Tier 2 Lands** are those Plum Creek lands that occur outside of Tier 1 watersheds. Fish habitats associated with these lands are important for other native salmonids as well as other life history stages for bull trout. Tier 1 watersheds and Tier 2 lands are shown on Map 2.2-2 in Chapter 2 of the EIS.
- **Key Migratory Rivers** are segments of large rivers bordering, and longitudinally encompassed by Plum Creek lands that provide habitat for any and all Permit species and are shown on Map 4.6-1 in Chapter 4 of the EIS. The distinguishing feature of Key Migratory Rivers is that they serve to connect the variety of habitats used by the migratory life forms of the Permit species. These are generally rivers that Permit species use to migrate from the ocean or a lake or a big river to smaller, lower order spawning or rearing streams. The Key Migratory River designation captures the largest streams throughout the Project Area where Permit species rely on the distinct features provided by larger river habitat, such as over-wintering habitat, foraging habitat, or pre-spawn staging habitat. Key Migratory Rivers also share a common legacy of historic land management patterns not usually found on other project area lands, including railroads and highways, residential development, concentrated recreation, and flood control and channelization.
- **Planning Area Basins** are the larger river basins within which Plum Creek Project Area lands occur. They are generally river systems that are interconnected. While bull trout occur in most of the Planning Area Basins, some of the covered species occur in only one or a few of them. These basins provide the planning context for evaluating the NFHCP so that the conservation benefits can be determined for each of the covered species. They are also used as the primary subdivisions.
- **Native Fish Assemblages (NFAs)** are watersheds containing unique assemblages of a diversity of Permit species. Limiting factors analyses and specific watershed analysis assessments will be conducted in the NFAs. Results from the analyses will be used by Plum Creek and the services to collaborate in the development of customized

management prescriptions to enhance conservation of these native salmonid concentrations.

- **High Priority Bin for Road Upgrades** are watersheds selected based upon risk features related to roads, such as erodible geologic types, streams considered “impaired” by the EPA because of sediment, and Native Fish Assemblages.

The Basis of NFHCP Conservation Commitments

Historical Forest Practices

Forest practices have occurred in the Project Area for over 100 years. Practices have evolved from unregulated forest resource extraction to the informed and regulated practice of sustainable forestry. With changes in forest practices, the impacts on fish habitat have also changed.

From the late 1800s through the 1920s, transportation of logs from the forest to the mill was largely water-based or via valley bottom railroads (Sedell and Beschta 1991). Where water quantities were insufficient for river drives, splash dams were built to impound enough water to flush logs downstream to larger rivers when the dams were breached. In the North Fork of Lost Creek (in the Swan River Valley, Montana), for example, Somers Lumber Company used such a splash dam during the period between 1914 and 1919. In that 5-year period, the company logged a 90-million-board-foot timber sale covering over 9,000 acres, the largest ever sold in the Flathead National Forest (McKay 1994). Obviously, splash dams had tremendous impacts on stream channels by straightening and simplifying them (Young et al. 1994) and subjecting them to frequent and intense artificial floods. These practices largely ceased by the end of the 1920s.

Beginning in the 1930s, tractors were used to transport logs down stream courses to valley bottom railroads. The replacement of railroads by log trucks occurred between the late 1940s and the 1960s. This moved the focus of log transport out of streams, but transportation still remained valley bottom-based and without the use of erosion control techniques. By the 1960s, studies were being conducted that demonstrated these kinds of practices could harm streams and fish habitat. Thereafter, forest managers began using techniques to buffer streams and exploring means to control sediment delivery (Plum Creek 1998a).

Conservation by Regulation

In 1972, Congress passed the Federal Clean Water Act (CWA) which, among other things, required states to develop programs to control pollution from “non-point sources” such as forestry. Because pollution is identified as those inputs to water that negatively affect beneficial uses, and since fisheries are identified as a beneficial use, the CWA became the basis for the first forest regulations designed to remove threats to fish. Idaho and Washington passed Forest Practice Acts (FPA) in 1974, which have since undergone significant change in response to greater knowledge of impacts and how to minimize them. Montana adopted Forestry Best Management Practices (BMPs) in 1989 and passed a streamside management law in 1991.

In addition to forest practice regulations and BMPs, changes in logging and road construction technology have significantly reduced impacts. While BMPs and FPA rules have recognized the importance of locating logging roads away from streams and installing stream crossings with extreme care, the shift from bulldozer-constructed roads to excavator construction during the 1980s improved road stability and allowed for more careful installation of erosion control measures. Because FPA rules often require special logging techniques in certain situations, the technological development of new cable logging methods, lower-impact ground based logging systems, and even the use of helicopters has made new, careful logging practices technically feasible.

Audits of forest practices have shown continued improvement in implementation of BMPs over time (Fortunate et al. 1998). Correspondingly, the effectiveness of these measures in preventing impacts to streams has increased. Because of their successful track record, BMPs and FPA rules are considered to be a strong base upon which to build conservation plan commitments. The package of conservation commitments outlined in this HCP begins with the premise that BMPs and FPA rules are generally effective at minimizing the impacts associated with contemporary commercial forestry. The Plum Creek Native Fish Science Team has assessed the effectiveness of BMPs and forest practice regulations in protecting native fish resources through several technical reports. The technical reports also identify opportunities to augment current BMPs and regulations where needed to further reduce risk to native fish habitat. Therefore, many of the NFHCP commitments start with implementation of a given BMP and describe enhancements to the BMPs that increase the confidence in BMP effectiveness as a long-term conservation measure.

Environmental Forestry

Environmental Forestry is Plum Creek's application of Environmental Principles, which were developed by Plum Creek in 1991 and further revised in 1998, while undertaking commercial forest management activities on Plum Creek lands. When Plum Creek became publicly traded in 1989, the company began exploring alternatives to traditional approaches to commercial forestry that had dominated the industry for decades. Plum Creek's goal was to address environmental needs on the landscape while continuing to be a successful forest products company. The result was the Environmental Principles (presented later in this section) and the application of Environmental Forestry in Plum Creek's daily operations.

Environmental Forestry has become an integral part of Plum Creek's business. Lumber customers seek Plum Creek products in part because of the environmental commitment of the company. Investors are attracted because of Plum Creek's desire to be successful while protecting the environment, and the demonstrated track record of doing so. Company managers are motivated by the key corporate success strategy of being "leaders in environmental forestry."

Environmental Forestry began by exploring broadly applied and generalized new approaches to forestry on a project-by-project basis. For example, with the advent of Environmental Forestry, the company reduced its use of clearcutting in the inland Northwest from more than 40 percent to fewer than 5 percent of all harvested acres. The company also began to rehabilitate old forest roads. While these general approaches have continued, they have

become increasingly augmented by specific science-based environmental initiatives that look at the broader landscape. Examples include the Central Cascades Habitat Conservation Plan (Plum Creek 1996c), the Swan Valley Grizzly Bear Conservation Agreement (Plum Creek 1997e), and conservation planning for the endangered red cockaded woodpecker in Plum Creek's Southern Region. Sound science has become an integral part of Plum Creek's business.

Fundamental to Plum Creek's environmental forestry philosophy is the precept that human needs for wood fiber can be provided through successful private enterprise while protecting environmental values. Related is the concept that some environmental solutions are more effectively and innovatively addressed within the realm of private enterprise because the landowner has the best opportunity to apply resources creatively and act proactively rather than reactively. The landowner is best able to apply conservation measures in the early stages of its management activities when those measures are likely to be most effective. The mutual goals of sustaining both the environment and business are also a fundamental basis for habitat conservation planning.

Plum Creek's Environmental Principles follow.

Plum Creek Environmental Principles, Resources (7/98)

As one of the largest private timberland owners in the United States, Plum Creek is committed to being the leader in environmentally responsible forest resources management. We believe the stewardship of forest resources is fundamental to economically prudent timber growth and harvest. Our forest management practices are based on sound scientific and economic principles and we abide by all legal and regulatory requirements.

All elements of Plum Creek's forest management activities, including site preparation, road building, harvesting and reforestation, are conducted according to the following principles:

- ***Sustainable Forest Management***—Manage our forests in a sustainable, socially responsible, economical manner. Work with others to foster the concepts of land stewardship and environmental responsibility.
- ***Ecological and Structural Diversity***—Enhance ecological and structural diversity where feasible and prudent by using a variety of silvicultural techniques and by retaining a diversity of vegetation and unique structural features.
- ***Water Quality***—Meet or exceed state and federal standards by employing Best Management Practices for the protection of water quality and aquatic resources, including the retention of buffers along streams, lakes and wetlands.
- ***Air Quality***—Protect air quality by burning only when prescribed burning is an appropriate silvicultural technique for the improvement of forest conditions or aesthetics in visually sensitive areas or when required by law for hazard abatement.
- ***Reforestation***—Ensure future forest growth and sustainable productivity by reforesting all harvested areas in a timely manner consistent with ecological conditions -- within two years in the Cascades and Southern Regions, and five years in the Rocky Mountain Region.

- **Soil Conservation**—Maintain soil and site productivity by minimizing soil disturbance and by recycling harvest residues for soil nutrient enhancement.
- **Fish and Wildlife Resources**—Conserve fish and wildlife resources through judicious control of road access, timber harvest management and cooperation with state and federal fish and wildlife agencies.
- **Visual Quality**—Recognize and manage for aesthetic values near communities and major travel corridors by using appropriate design standards and harvest methods.
- **Adjacent Land Management**—Cooperate with adjacent landowners to address and minimize potential impact of forest management activities.
- **Research and Development**—Apply new scientific, social and economic information to improve silvicultural practices and enhance environmental and financial performance.
- **Performance Audits**—Conduct regular performance audits to ensure that environmental commitments have been met or exceeded through the application of these environmental principles.

EP1: Environmental Principles Commitment

Plum Creek commits to continue practicing forestry according to its Environmental Principles.

These principles may be revised by Plum Creek from time to time, and are not intended to be inflexibly applied (in the context of this HCP or otherwise). Rather, they are statements of Plum Creek’s philosophy and approach. While these principles alone do not compel any particular action by Plum Creek in the context of this HCP, they do establish a principled basis or operating philosophy for managing timberlands while protecting the environment.

Note: Throughout this document, Plum Creek’s commitments are described in boxes like this one. The text following the box will explain the rationale for each commitment.

Rationale:

The Environmental Principles commitment in the Native Fish HCP provides the principled basis for all the commitments that follow and the business philosophy that Plum Creek brings to conservation planning.

Examples of the implementation of these principles over the past 9 years are provided in the numerous sidebar articles contained in this document.

Plum Creek’s Central Cascades HCP

In June 1996, Plum Creek’s Central Cascades HCP was approved by the Services. This HCP is a 50-year plan to address the needs of 285 fish and wildlife species on 170,000 acres of company ownership in the central Cascades Range of Washington. Federally listed species known or suspected to reside in the Planning Area include the northern spotted owl, marbled murrelet, grizzly bear and gray wolf.

A primary strategy for the HCP was to tier off the President’s Northwest Forest Plan for U.S. Forest Service lands in the area, augmenting federal protections for riparian and late successional forest habitat (“old growth”) with additional measures on adjacent Plum Creek lands. Development of the Plum Creek Central Cascades HCP required more than two years and entailed an unprecedented level of public review and involvement. The incidental take permit issued with the HCP has been recently amended to include bull trout, the habitat for which was addressed and analyzed in the plan prior to the listing of the species.

The development of this HCP is an example of a more sophisticated and science-based strategy by Plum Creek under the umbrella of Environmental Forestry.

Constructing NFHCP Commitments

In light of the foregoing discussion, Plum Creek's conservation commitments described in the following section are based on these ingredients:

- Biological goals for fish species
- Business goals for Plum Creek
- State forest practice regulation as a strong basis and starting point for developing further conservation measures
- Environmental Forestry as the operating philosophy for the NFHCP

For a variety of reasons, state forest practice regulations are a good place to start when designing a conservation plan. First of all, an HCP does not relieve a landowner from the obligation to follow state law. If conservation features were designed independent of state law, risk of not meeting the law in all cases would increase. Second, as noted earlier, state forest practice rules are good conservation strategies in and of themselves. Plum Creek foresters and loggers have been trained in implementing them and have become among the best in the business at applying them when faced with a wide variety of situations in the woods.

Therefore, a point of focus for the Plum Creek Native Fish Science Team was to identify where the best opportunities exist for a landowner to supplement state forest rules and regulations to further reduce risks to fish associated with forestry practices.

A Broad-Based Approach to Conservation

The complex challenges that native salmonids face are the result of a multitude of natural and human-induced factors. Therefore, conservation solutions must be designed to address this wide range of factors rather than be exclusively focused on one or two. A broad-based approach increases the chance of success.

Many of the factors that affect fish are completely outside of Plum Creek's control or sphere of influence, such as the widespread competition of exotic fish species, legal and illegal fishing, or the influence of hydroelectric dams. Solutions in these areas should be pursued in other forums. But when the Plum Creek team looked for opportunities to provide conservation for salmonid fish species, they tried to look at the broadest spectrum possible of Plum Creek activities and potential areas of influence.

To do this, the team identified seven broad categories to describe the full range of potential impacts Plum Creek activities might have on fish. Within each category, the team examined how those activities might affect any of the Four C's ("Cold, Clean, Complex, Connected," page 1-7). These categories form the sections that follow, and contain the conservation commitments that are the foundation of the NFHCP. The commitments are described and

then followed by discussions of the scientific rationale, managerial reasoning, and common sense that went into the development of the commitment.

Under the ESA, an HCP applicant is required to provide a conservation plan that **minimizes** and **mitigates** the impacts of its planned activities on the covered species. Plum Creek's package of commitments goes beyond this basic requirement by additionally offering mitigation for the lingering effects of past practices.

The categories of commitments are briefly summarized here to demonstrate the broad-based approach used by Plum Creek to create a meaningful conservation package.

- **Road and Upland Management.** Conservation commitments in this category include measures that are designed to minimize the impacts of constructing new roads by reducing potential sediment production entering streams. These are combined with measures that mitigate the ongoing impacts associated with old roads built before the development of modern erosion control standards.
- **Riparian Management.** Conservation commitments in this category are designed to provide a continuous supply of large woody debris (LWD) to streams, maintain shade to moderate temperature extremes, and provide a filter for potential sediment generated from upslope (non-riparian) activities.
- **Range Management.** Range management commitments start by minimizing the impacts of livestock grazing on native fish habitat arising from leases on company lands in the Project Area. Appropriate management activities mitigate impacts associated with more than a century of grazing.
- **Land Use Planning.** Measures within this category are designed to anticipate and minimize the potential impacts to native fish habitat from land development for purposes other than forest management.
- **Legacy and Restoration.** Reflecting a land base that historically has had a wide variety of owners and intensive management over several decades, conservation opportunities in this category include identification and treatment of problems associated with past land and fisheries management. Other miscellaneous opportunities for cooperation and restoration are included in this category as well.
- **Administration and Implementation.** Commitments in this category ensure that practices proposed in the NFHCP are properly implemented on the ground and are evaluated for continuous improvement.
- **Adaptive Management.** This category includes Core Adaptive Management Projects designed to acquire monitoring and research data needed to evaluate the success of the NFHCP at meeting the NFHCP biological goals and to determine the need for and nature of any management response.

Pay-as-you-go. Plum Creek explicitly intends to provide a net improvement in riparian function for fish right from the beginning of the NFHCP. Because restoration of riparian function is what “pays” for incidental take that may occur, this strategy is called a “pay-as-

you-go” approach. Many HCPs, such as one designed for a single development project, authorize incidental take early in the project period while spreading out mitigation throughout the project. In the NFHCP, Plum Creek has the opportunity to immediately contribute to restoration of riparian function that exceeds impacts to that function associated with ongoing management. The “pay-as-you-go” approach means that Plum Creek expects that improvement in riparian function will equal or exceed any take associated with the NFHCP throughout the term so long as they are in compliance with the terms of their Permit. It also means that Plum Creek could request termination of the permit if it elects to do so (see Appendix A, *Implementing Agreement*, of the DEIS).

Role of Technical Reports in Development of the NFHCP

To provide a scientific foundation for development of Plum Creek’s NFHCP, 13 technical reports were prepared by Plum Creek and outside scientists (Table NFHCP1-4). Each technical report was reviewed by outside experts in one of the following manners:

1. Distribution to interested parties and regulatory agencies (Technical Reports #1, #5, #6, #9, #10, and #11).
2. Publication as a peer-reviewed journal article (Technical Report #2).
3. Peer-review by outside experts chosen by Plum Creek and the U.S. Fish and Wildlife Service (Technical Reports #3, #7, #8, #12, and #13).
4. Manuscript submitted for publication in a peer-reviewed journal (Technical Report #4).

In addition, four “white papers” were also prepared (Table NFHCP1-4). The white papers are generally more informational in nature and thus were not externally reviewed as extensively as the technical reports.

TABLE NFHCP1-4
Plum Creek Technical Reports Used in Crafting the NFHCP

Plum Creek Technical Reports		Lead Author
#1	Implementation of a Method to Detect the Presence of Bull Trout	T. Hillman
#2	Factors Affecting the Distribution and Abundance of Bull Trout: An Investigation at Hierarchical Scales	G. Watson
#3	Surface Erosion and Mass Wasting Assessment and Management Strategies for Plum Creek’s Native Fish Habitat Conservation Plan	D. McGreer
#4	An Ecological Classification Integrating Uplands and Riverine/Riparian Habitats Applied to the Thompson River Basin, Montana	S. Jensen
#5	Goat and Piper Creeks Watershed Analysis	G. Watson
#6	Summary of Regulatory and Voluntary Programs for Protecting Bull Trout on Forest Lands within Plum Creek’s Aquatic Habitat Conservation Planning Area	B. Sugden
#7	Design of Effective Riparian Management Strategies for Aquatic Resource Protection in Montana, Idaho, and Washington	J. Light

TABLE NFHCP1-4

Plum Creek Technical Reports Used in Crafting the NFHCP

Plum Creek Technical Reports		Lead Author
#8	Synthesis of Watershed Analysis and Ecoclassification at a River-Basin Scale for the Conservation and Management of Aquatic Ecosystems	G. Watson
#9	Swan River Basin Ecological Classification	S. Jensen
#10	Thompson River Basin Ecological Classification	S. Jensen
#11	Thompson Watershed Analyses: Beatrice Creek, Boiling Springs Creek, Murr Creek	B. Sugden
#12	Stream Temperature Considerations in the Development of Plum Creek’s Native Fish Habitat Conservation Plan	B. Sugden
#13	Adaptive Management: Concepts and Applications to Plum Creek’s Native Fish Habitat Conservation Plan	L. Hicks
Plum Creek White Papers		
	Livestock Grazing on Plum Creek Timber Company Land in the Native Fish Habitat Conservation Planning Area	B. Sugden
	Plum Creek Timber Company Higher and Better Use Lands and Implications for Native Fish Conservation	J. Sorensen
	Thompson River Riparian Reconnaissance and Monitoring	S. Miles
	Grazing Best Management Practices	Plum Creek

The purpose of these reports was to compile, analyze, and interpret the best available scientific information and technical data on topics fundamental to the preparation and direction of the NFHCP. Economic and operational considerations were blended with information compiled in the technical reports to create the NFHCP. Consequently, the technical reports and white papers do not contain specific prescriptions and standards.

Plum Creek’s Evaluation of Effects

Section 4.6 of the EIS/NFHCP document is an example of how the combined document approach has avoided redundancy and unnecessary pages. It serves to fulfill the Services’ NEPA obligation to evaluate and disclose the effects to fish of issuing an ITP to Plum Creek, who will implement NFHCP conservation commitments. Section 4.6 also fulfills Plum Creek’s obligation to specify the impacts that will likely result from implementing activities covered by the Permit, as required by the ESA.

The ESA requires an applicant for an ITP to “specify the impact that will likely result from such taking,” 16 U.S.C. § 1539(a)(2)(A)—that is, the incidental taking specifically authorized by the ITP. Plum Creek believes—and has stated to the Services—that the NFHCP itself will not result in any “take”; that is, direct mortality, of individual members of species covered by the NFHCP. However, Plum Creek acknowledges that some of its activities may affect fish habitat, and those impacts are described in Chapter 4 of the EIS/NFHCP document. While Plum Creek activities covered in the NFHCP may continue to

impact fish habitat, implementation of NFHCP commitments will minimize and mitigate for those impacts and allow for recovery of Permit species. The NFHCP also goes beyond basic HCP requirements by providing an important contribution to recovery of listed Permit species by addressing lingering impacts of past activities by other owners of Project Area lands.

Plum Creek has indicated to the Services that the effects analysis in Section 4.6 adequately represents the analysis of effects for Plum Creek for the purpose of fulfilling its obligation under the requirements for an HCP. In addition, Plum Creek has summarized the major conservation benefits of the NFHCP as follows:

- The combined benefits of the NFHCP package would greatly accelerate improvement in key fish habitat elements as represented by the NFHCP Biological Goals (the Four C's) over a large area.
- Proactive early conservation under the NFHCP would remove threats to fish sooner than would occur through the usual regulatory process. The effects analysis notes that such rapid implementation of conservation measures can be critical for recovering those fish populations under the greatest stress from past management activities.
- The NFHCP would result in the reduction of lingering effects from past management that would be difficult to address otherwise. While the NFHCP would implement measures that minimize the impacts of Plum Creek's existing covered activities, removing lingering effects from past management is thought to be a key element contributing to recovery. By doing so, Plum Creek's NFHCP would go beyond the basic requirement of HCPs to "minimize and mitigate the effect of such taking" from covered activities alone.
- The NFHCP would provide for robust adaptive management that ensures the public that the plan would respond to the latest scientific research and refine conservation commitments accordingly in order to achieve the NFHCP Biological Goals.
- The NFHCP commits Plum Creek to conduct basic research that would add significantly to the body of science available for a variety of conservation efforts for native salmonids.

In conclusion, Plum Creek believes that the unprecedented set of conservation commitments outlined in the NFHCP would provide an important contribution to long-term recovery of listed fish species within the Project Area and would benefit other non-listed species, as well. Additionally, the example set by the NFHCP may lead to other creative partnerships between private landowners and the federal government to provide an even more comprehensive conservation strategy for native salmonids in the Planning Area. The conservation commitments are summarized on the following page, *NFHCP Commitments at a Glance*.