

6 Legacy and Restoration Commitments

The Commitments

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Project Area lands have been managed intensively for a variety of purposes by a variety of landowners for many years. While minimizing the impacts of current and future activities is critical to a comprehensive conservation plan, land practices have improved vastly over the last 100 years, and particularly in the last 10 years, in ways that minimize impacts to fish. However, the lingering effects of past activities (“legacy impacts”) can remain even while current practices

improve. Additionally, some impacts to native fish may be unrelated to land management or previous owners’ specific activities that still represent a unique opportunity for conservation. It is these opportunities for conservation that are lost through a traditional regulatory approach because it is difficult to require one landowner to repair impacts caused by the actions of a previous landowner. The incentive of an HCP is an excellent context for filling these gaps, and the NFHCP features this section as an opportunity to do so.

Old roads are probably the greatest legacy impact, and they are covered in the Road and Upland Management section of this plan. Similarly, by minimizing current impacts of grazing, mitigation of past impacts begins to take place. Some mitigation of legacy grazing impacts is included in Section 4 of the NFHCP, Range Management Commitments.

This category of commitments provides miscellaneous conservation approaches that mitigate the ongoing impacts of past activities that have not already been addressed, as well as addressing some threats to native fish that may be unrelated to landowner activities. This section covers these areas:

- A. Key Migratory Rivers
- B. Fish habitat restoration
- C. Other opportunities for removing threats

A. Key Migratory Rivers

Plum Creek land in the Project Area contains 124 miles of Key Migratory Rivers, which are key to bull trout and other native salmonids. These rivers flow through project Tier 2 lands and are important for migration and foraging by bull trout and other native salmonids. They are key connection routes for bull trout to maintain and enjoy a migratory life form. When bull trout are free to migrate, they can travel as far as 100 miles to find their traditional spawning grounds and continue their life cycle. These rivers also provide important habitat for adult rearing and foraging, and may be the best location for overwintering of adult native salmonids because of the potentially deep pools and cover of overhanging banks.

Plum Creek has identified as Key Migratory Rivers those rivers that are known to be important corridors for migration of bull trout as well as other rivers because of their potential as a Key Migratory River or because of their value for other native salmonids. The Fisher River in Northwest Montana, for example, is designated in the NFHCP as a Key Migratory River even though its current and past use for bull trout migration is unknown. However, a disjunct population of bull trout; that is, one that is isolated from other populations, does occur in West Fisher Creek. Plum Creek included the Fisher River as a Key Migratory River because of the possibility of restoring migration between West Fisher Creek and the Kootenai River. Such restored migrations can reduce the risk that bull trout populations will be lost because of isolation and the genetic inbreeding and loss of genetic variability that may result.

Key Migratory Rivers also happen to occur in lowland valleys that have been subjected to some of the most severe pressures of human activity on fish habitat for the longest period of time. In addition to development that has occurred on these lands after sales to smaller owners, much evidence of the lingering effects of past activity remains on Plum Creek land. This evidence includes the following:

- Channel dredging and straightening.
- Simplification of wetland complexes because of the trapping of beavers and the decomposition of their dams
- Conversion of brushy riparian bottoms to well-drained pasture and hay lands.
- Commercial timber harvest prior to streamside protection regulations.
- Intense grazing over many decades.
- Encroachment by transportation systems.
- Accessibility to pressures of public recreation.

The Champion Purchase

In late 1993, Plum Creek purchased the Montana holdings of Champion International. These recently purchased properties comprise over 50 percent of the Project Area. The property was widely known to be for sale and could have been purchased by the government or by environmental groups in order to implement restoration for native fishes. Because Plum Creek was able to incorporate these properties into their land management portfolio, they are now able to offer conservation for legacy impacts that would be otherwise difficult to secure.

Much of these former Champion lands were among the earliest lands purchased from the railroads by the Copper Kings of Anaconda Copper at around the turn of the last century. They could pick the select lands based on their accessibility and the potential for water based transportation, which were those parcels in the valley bottoms. In fact, over 75 percent of the designated Key Migratory Rivers in the project flow through former Anaconda Copper lands. A 1923 Anaconda Land Examinations Report for a Blackfoot River Parcel states, "logs can be landed at the river at reasonable cost." A 1902 report states that, "this section has been cut all over...." Rivers were a good place for transporting and milling logs, and land-close to the river were the logical choices for early economic development.

Marcus Daly and Anaconda Copper added other purchased lands for their economic attributes through the next several decades and then sold off to a variety of smaller timber companies. In the early seventies, Champion moved into the picture, purchasing timberlands and eventually recombining many of the Daly properties before selling to Plum Creek.

- Accessibility to misinformed and damaging past fisheries management practices.
- Incursion sites for noxious weeds

The conservation strategy for these rivers follows a three-step process: 1) **assessment**, 2) **implementation**, and 3) **monitoring**. Under this approach, the entire Project Area river system is surveyed, and legacy impacts are assessed. After that, restoration projects are implemented on a site-specific basis, depending upon the problem.

**Plum Creek Ownership along
Key Migratory Rivers by Planning Area Basin**

Blackfoot River:	12 miles
Lower Kootenai River:	7 miles
Middle Clark Fork River:	35 miles
Swan River:	11 miles
Middle Kootenai River:	40 miles
Upper Clark Fork River:	3 miles
Lochsa River:	9 miles
Lower Tieton River:	3 miles
North Riffe Lake:	4 miles

Lg1: Assessment—Riparian Condition Survey

A Riparian Condition Survey will be completed on select stream segments (see Lg2 and G2) in the Project Area. The first step in the survey will be an aerial reconnaissance by a riparian ecologist. The reconnaissance will identify those riparian areas that are likely “functioning properly” based on the ecologist’s expertise and experience in applying riparian assessment procedures such as:

- The Bureau of Land Management’s functioning condition assessment (BLM 1995).
- The University of Montana Riparian Wetland Research Program’s Lotic Health Assessment (UM RWRP 1998).
- The Riparian Function module in the Washington Watershed Analysis Methodology (WFPB 1995).

These surveys will measure things such as the percentage of floodplain and streambanks covered by plant growth, streambank stability, woody species establishment and regeneration, soil disturbance, and channel incisement.

Riparian segments identified as “likely functioning properly” based on the aerial reconnaissance phase will be verified by conducting a random sample of on-the-ground inspections. If more than 90 percent of calls are correct, the aerial reconnaissance will be considered successful. If fewer than 90 percent are properly identified, on-the-ground verification will be done for all stream segments.

For those riparian areas which the reconnaissance indicates may not be functioning properly, an on-the-ground assessment will be completed by the ecologist (again, using the ecologist’s expertise and experience in using procedures such as discussed above). This assessment will determine if each riparian segment (1/4-mile minimum length) is functioning properly. For those not functioning properly, a causal factor will be identified (such as grazing, timber harvest, old mill sets, clearing for agriculture, or natural condition), a description of the condition will be prepared, and a relative impact rating assigned. Restoration options could also be identified at this time.

- All assessments will be complete by the end of year seven of the NFHCP.
- A flowchart describing this approach is provided in Appendix Lg-1.

Rationale:

Plum Creek knows of a variety of locations along Key Migratory Rivers where legacy impacts exist and restoration could be implemented. However, commitments made only on known locations would not provide assurance that all high-impact sites would be addressed. Unfortunately, there was no way to do a full-scale assessment before developing the NFHCP. As such, the Riparian Condition Survey approach was developed to address the entire length of Key Migratory Rivers in the Project Area, thereby creating a programmatic approach to identifying and targeting restoration. The Services may then be assured that a plan is in place to keep heavily impacted reaches from slipping by unnoticed.

Assessment provides important conservation by bringing problem areas to attention so that restoration can be implemented.

Upper Thompson River Riparian Assessment

The Thompson River is a Key Migratory River tributary to the lower Clark Fork River in Montana. In 1993, Plum Creek acquired much of the land adjacent to the Thompson River from Champion International. Shortly thereafter, Plum Creek’s hydrologist identified the Upper Thompson River as a spot with major riparian impacts, attributable to historic shrub and willow clearing for hay meadow development and livestock grazing.

To evaluate these problems, Riparian Resources Inc. was hired to prepare a detailed riparian assessment along four miles of the Upper Thompson River. This analysis confirmed much of the native willows and shrubs that should be present were not. It also revealed much of the riparian area was functioning “At Risk” based on the Bureau of Land Management’s riparian assessment protocol. It also discovered that an especially tenacious exotic grass (reed canarygrass) was present that would make riparian restoration difficult in places. Recommendations were made about which riparian segments would most benefit from intervention (active riparian restoration), and which were recovering sufficiently on their own. For more information, see the Thompson River Riparian Reconnaissance and Monitoring white paper (Plum Creek 1997d).

Lg2: Implementation—Riparian Vegetation Restoration

All Key Migratory Rivers in the Project Area will be evaluated using the Riparian Condition Survey (See Lg1 above). For those riparian segments determined to be “not functioning properly” in Lg1, a detailed restoration plan will be prepared by a riparian ecologist and submitted to the affected Services for technical input within the first 8 years of the NFHCP. Each project will contain metrics for the purpose of using as a benchmark to monitor success of the project. For segments where riparian restoration (intervention) would greatly accelerate recovery, restoration plans will be implemented within the first 15 years of the NFHCP. Prioritization of implementation will depend on factors such as:

- Severity of the problem.
- Opportunities for cost-sharing restoration.
- Linkage with other state and federal programs (such as total maximum daily load [TMDL] development, or wildlife).
- Overlap with other NFHCP riparian treatments, such as construction of livestock exclosures (G2), and engineered habitat restoration (Lg4).

After year 5 of the NFHCP and before the start of year 7, Plum Creek and the Services will review data from projects implemented to determine whether the development of triggers (for use in the implementation framework, Table NFHCP 8-1B) is feasible or appropriate. If so, they will determine what those triggers will be. This will be undertaken as a mandatory collaborative management response.

Rationale:

An aquatic ecosystem is more than just flowing water. It encompasses the vegetative community adjacent to the stream as well as the hydro-logic processes that surround it (Stanford and Ward 1992). Plum Creek believes the restoration of diverse native riparian communities adjacent to severely impacted Key Migratory Rivers can result in numerous benefits to native fish, such as the following:

1. Promoting Cold water through increases in stream shading, channel narrowing, and restoration of floodplain and hyporheic (or below ground surface) processes.
2. Increasing channel Complexity by development of undercut stream banks and creation of cover.
3. Enhancing the sediment filtering capabilities of streamside areas (Clean).
4. Improving Connectivity by creating a more continuous length of favorable habitats.

Upper Thompson River Riparian Restoration

Riparian restoration was implemented along 1/4 mile of the Upper Thompson River in 1998 as a demonstration project. The riparian objectives of the project included: 1) improve bank stability, 2) create shade along the river, 3) develop over-hanging stream banks, and 4) increase native plant community diversity. The best way to advance each of these objectives was to establish native shrubs in the near-bank region of the floodplain.

Plum Creek's operational management objectives of the project were to: 1) experiment with a variety of treatments 2) determine costs among various treatments 3) evaluate the effectiveness of various treatments and 4) figure out how these types of projects could be implemented across a broad area as part of the NFHCP.

Treatments implemented along the Upper Thompson included the following:

- Spot scarification to reduce competition with reed canarygrass
- Planting 1200 native willows, 300 red osier dogwoods, 300 mountain alders, and 200 black cottonwoods
- Testing use of "mulch mats" to reduce competition with grass (30 percent of shrubs treated)
- Experimentation with "browse protectors" to minimize seedling damage from deer and elk (30 percent of shrubs treated)
- Stabilization of 140 feet of actively eroding streambank with "bio-engineering" techniques

The relative successes of the various treatments will be evaluated over the coming years to direct future restoration along the Upper Thompson and guide restoration projects throughout the NFHCP Project Area.

Lg3: Monitoring—Riparian Vegetation Restoration

Plum Creek will monitor the trend in riparian/stream condition and fish habitat along Key Migratory Rivers where restoration activities have been initiated as part of Lg2 to obtain feedback on the success of the program. This study will involve collecting riparian and habitat data on randomly selected treatment (impact) and control stream reaches on Key Migratory River segments determined to be "not functioning properly" in Lg1. The Services are encouraged to cooperate with Plum Creek on development of the specific study design.

In the conceptual study design described in Technical Report #13 (Plum Creek 1999b), it is envisioned that there would be three control reaches and three treatment reaches. In each reach, data will be taken on in-stream characteristics (such as pool depth, percent fine sediment, channel width, percent over-hanging banks, and percent cover), riparian characteristics (such as vegetation composition, and vegetation type), and the fish community (species and size class distribution of fish). This information will, where possible, be supplemented with aerial and ground-based photographic monitoring. Results will be used to quantify the benefits and costs of undertaking riparian/stream enhancement along Key Migratory Rivers in the NFHCP Project Area.

Rationale:

As with any project of this type, monitoring is necessary to verify if the desired outcomes were achieved (Reeves et al. 1991). This study will be undertaken as part of Adaptive Management Commitment AM1 (Section 8 of the NFHCP, page 8-13).

B. Fish Habitat Restoration Opportunities

These commitments address restoration within the stream itself rather than in the streamside ecosystem.

Upper Thompson River Monitoring

Baseline monitoring data were taken along the Upper Thompson River in 1997 as part of the initial riparian reconnaissance (Plum Creek 1997d). Data included stream cross sections, photo points, and riparian vegetation plots. These data will be sufficient to document changes in the riparian community and large-scale changes in the stream channel. It is insufficient, however, to document trends in the quality of fish habitat. Additional data will have to be taken in the NFHCP commitment Lg3, *Monitoring—Riparian Vegetation Restoration* to evaluate benefits of riparian restoration to fish.

Lg4: Engineered Habitat Restoration

As opportunities arise, Plum Creek will cooperate in engineered stream habitat restoration projects. The process of “guilding” streams, a Geographic Information System-based classification used to group physically similar channel segments (Plum Creek 1998c), could diagnose the need for these restoration projects. Watershed analyses conducted in Washington and elsewhere could also identify the need for in-channel restoration. In other cases, fish management agencies or watershed groups may identify opportunities. Where implemented, Plum Creek will have to be highly confident the in-stream structure would address the limiting factor for native fish in that particular stream. Engineered habitat restoration could include:

- Addition of large woody debris
- Placement of boulders
- Bank stabilization techniques
 - Rock turning barbs
 - Wood cabled to bank
 - Erosion control matting

Rationale:

Engineered stream restoration is not a primary focus of the NFHCP. Rather, Plum Creek has emphasized the creation of healthy riparian environments that promote the development of healthy in-stream conditions over the long-term. There are, however, occasions where engineered stream restoration is a viable option for improving fish habitat (Reeves et al. 1991). As opportunities arise, Plum Creek will propose or cooperate in implementing engineered stream restoration projects where it has a high degree of confidence that native fish will benefit.

Gold Creek Stream Enhancement Project

In 1995, the Montana Department of Fish, Wildlife, and Parks (MDFWP) approached Plum Creek about cooperating in a stream enhancement project on lower Gold Creek (a Tier 1 stream tributary to the Blackfoot River in Montana). MDFWP surveys indicated the lower three miles of Gold Creek was devoid of significant structures (such as large logs and primary pools) and that a stream enhancement project could greatly increase channel complexity for the benefit of migratory and resident fish. Plum Creek's fish ecologist agreed. In the fall of 1996, Plum Creek supplied 80 logs toward completion of this project. In addition to MDFWP and Plum Creek, other cooperators included the U.S. Fish and Wildlife Service, Trout Unlimited, Montana Department of State Lands, and Blackfoot Challenge watershed group. MDFWP data indicate the newly created pools in this reach of stream are now being extensively used by larger cutthroat trout, and that bull trout are making use of the habitat as well. A manuscript detailing the success of this project is presently in review.

Lg5: Diversions

Plum Creek will develop a management plan to manage the impacts caused by irrigation diversions that occur on Plum Creek lands. The management plan will be complete by July after the end of the third year of the NFHCP. Components of the plan include:

- An inventory of diversions occurring on Plum Creek land.
- An investigation and report of the legal status of each diversion.
- An impact assessment and rating of each diversion.
- Development and implementation of diversion BMPs.
- Active involvement with water rights holders in designing viable alternatives to reduce or eliminate impacts to native fish.

Rationale:

In the inland West, water has been an important commodity to settlement and economic development. Water rights continue to be an extremely important and valuable property right over which feuds have been fought and court battles have been waged. In a number of instances, Connectivity to important spawning grounds for bull trout and migratory westslope cutthroat is cut off because irrigation diversions have been installed and maintained for decades or even a century.

In some cases, these diversions may be outright illegal. In others, water rights are recorded and a significant and legal portion of the value of a ranch or property. But if the stream is cut off to the migration of native salmonids, all of the buffer that could be provided to streams or all of the roadless acreage that could be preserved would not help the fish. As a creative partner cooperating with neighbors or as a protective landowner prohibiting illegal activities on its lands, Plum Creek can be involved in solutions that would be difficult for the government.

The Water of the Schroeder Ranch

In the 1890s, Frank Schroeder homesteaded at Bend in the Thompson River in Montana. To irrigate his hay fields, he diverted Schroeder Creek, and ran the water into a 3-mile ditch at the base of the hillsides of the Thompson (which collected more water) to his ranch. He recorded that as his legal property right in 1901.

One hundred years later, Schroeder's descendant, Carlin Maw, is trying to make a go of the ranch, and water is essential. While Maw and Plum Creek Fish Ecologist, Greg Watson, were at the site discussing the impacts of the diversion, a young, dead bull trout was seen floating in the ditch. Carlin's dog ate the evidence.

Mr. Maw is interested in the conservation of native fish, but also in the value of his inheritance, which depends upon water. In seeking help from the government, he has run into confusing and conflicting advice. As a private neighboring landowner, Plum Creek is working with Maw on a solution that gives him rights to cross Plum Creek land for access to water from the river in exchange for abandonment of the traditional water right at the stream named after his forebears. Plum Creek can then take action to restore the connectivity of Schroeder Creek at the diversion site as well as abandoning the ditch where it crosses Plum Creek land.

C. Other Opportunities for Removing Threats

The following commitments address impacts that are unrelated to Plum Creek's past or current activities, but provide an opportunity to contribute effort or expertise for a conservation benefit.

Lg6: Brook Trout Suppression in Gold Creek

Plum Creek will prepare a proposal to conduct brook trout suppression in the Gold Creek Tier 1 watershed (or another appropriate stream) in cooperation with the Montana Department of Fish, Wildlife, and Parks. This project will evaluate the effectiveness of brook trout population suppression via electrofishing removal in conjunction with prima-cord detonation. Effectiveness of suppression efforts will be evaluated through monitoring both the responses of native species populations as well as documenting the extent, locales, and timing of brook trout re-invasion. Study objectives are to evaluate the potential of exotic species suppression efforts in terms of the applicability to conservation and restoration of populations of native salmonids. It would be done under the adaptive management portion of the NFHCP.

If monitoring results suggest that native stocks exhibit a statistically significant positive response to suppression treatments, study findings may be utilized to identify other locales/drainages within the NFHCP Planning Area where additional suppression efforts may benefit native stocks. That is, suppression efforts in certain channel types may result in a positive response (e.g., an increase of native stocks) where other channel types exhibit no response or rapid recovery of exotics. In the interest of cost versus benefit, expanded suppression efforts may focus on channel types where recovery of native stocks can be accomplished with minimum cost and/or effort.

Phase 1 of the study will commence within 2 years of Permit issuance, contingent upon acquisition of all necessary state and federal permits, with initial treatments and density estimates for a period of 2 years. Phase 2 will involve the operational implementation of the technique to other watersheds after evaluation of biological and economic effectiveness based on Phase 1 results.

Rationale:

Brook trout are a non-native fish in the Planning Area that directly compete with native fish. In addition, brook trout hybridize with bull trout, producing sterile offspring.

While the emphasis of this plan has been on conserving habitat, native fish may experience little benefit unless the impacts of exotic fish, such as brook trout, are addressed as well. While this study does not purport to address the serious problem of exotic species, it does attempt to improve our knowledge about ways to suppress them.

Lg7: State Fish and Game Enforcement Agreements

Plum Creek will seek agreements with state fish management agencies to step up and focus enforcement activities on violations that impact native fish, such as poaching or illegally targeting threatened or endangered fish by outfitters.

Rationale:

Plum Creek has an open lands policy that allows the public to use company lands for dispersed recreational activities such as hunting. Because of resource concerns and to protect its assets, Plum Creek has some restrictions and guidelines on the use of roads and camping spots. But, like many things, the privilege of many is abused by a few, and Plum Creek spends many thousands of dollars each year repairing and replacing vandalized gates and maintaining rutted roads. State fish management agencies are generally interested on behalf of the public in assuring continued use of these corporate lands for hunting and fishing. Also, the State has

personnel who are trained and authorized in law enforcement. These compatible interests can be the basis for agreements that can focus state enforcement activities on property owner restrictions designed to protect resources.

Montana Block Management

MDFWP administers a program called the Block Management Program in order to encourage private landowners to keep their lands open for hunting and fishing. This has traditionally been used mostly in agriculture lands in eastern Montana. But in 1994, Plum Creek and MDFWP created the largest Block Management agreement in the state—771,000 acres of Plum Creek timberland.

Under this program, Plum Creek provides a commitment to allow open public use for hunting and fishing and MDFWP provides enforcement of Plum Creek road restrictions and other recreational and camping rules. MDFWP also has greater access to Plum Creek lands for enforcement of general fish and game rules. Radio contact with Plum Creek foresters enhances this cooperative effort.

Frank Bowen, MDFWP Game Warden, has noticed a change in the attitude of the public. "When I first became involved in the program with Plum Creek, it was common to hear of hunters and fishermen who were mad about being locked out of certain roads by gates. Now it is more common to hear sportsmen express their appreciation for using so much private land or comment on the improved hunting experience in some walk-in areas."

Lg8: Watershed Cooperation

- Plum Creek will participate, wherever possible and on an ongoing basis, as a cooperator in multi-stakeholder watershed groups such as:
 - Montana Bull Trout Restoration Plan Watershed Groups
 - Idaho Basin Advisory Groups and Watershed Advisory Groups
 - Washington Watershed Analysis
- Plum Creek will also participate wherever possible in information exchange with neighboring landowners to enhance cooperative watershed planning efforts.

Rationale:

Watersheds and river basins contain riparian ecosystems upon which healthy fish populations depend. Yet these natural boundaries seldom match up with ownership boundaries. The states have adopted voluntary cooperative approaches on a watershed basis so that neighbors and other stakeholders can work together for conservation. By Plum Creek participation in these groups, partnerships can be secured to accomplish projects that would likely not be done by single parties. Furthermore, by enlisting partners in NFHCP initiatives, Plum Creek can multiply the effectiveness of commitments made in this plan.